

The logo for Eduweb features a stylized red 'E' with a white dot in the center, followed by the word 'Eduweb' in a bold, dark blue sans-serif font.

Eduweb

Revista de Tecnología de
Información y Comunicación en Educación

Online ISSN: 2665-0223

Print ISSN: 1856-7576



Volumen 18, No. 3.
Julio - Septiembre 2024

Universidad de Carabobo
Facultad de Ciencias de la Educación



UNIVERSIDAD DE CARABOBO

Rectora

Jessy Divo de Romero

Vicerrector Académico

Ulises Rojas

Vicerrector Administrativo

José Ángel Ferreira

Secretario

Pablo Aure

Facultad de Ciencias de la Educación

Decana

Ginoid Sánchez de Franco

Director Escuela de Educación

María Auxiliadora González

Dirección de Docencia y Desarrollo Curricular

María Cristina Arcila

Dirección de Investigación y Producción Intelectual

José Álvarez

Dirección de Asuntos Profesorales

Zoraida Villegas

Dirección de Estudios para Graduados

Flor Morales

Dirección de Administración

José Gregario López

Directora-Editora de la Revista Eduweb

Elsy Medina

Consejo de Desarrollo Científico y Humanístico

Vicerrector Académico Presidente

Ulises Rojas

Director Ejecutivo

Aaron Muñoz

Depósito legal: pp200702CA2520

ISSN: 1856-7576

© 2007, Eduweb

Código Revencyt: RVE022

Registrada en el Catálogo Latindex con el número de folio 19424

Directora General/Editora Jefe

Dra. Elsy Medina

Facultad de Ciencias de la Educación, Universidad de Carabobo

Subdirector

Dr. Honmy Rosario

Facultad de Ciencias de la Educación, Universidad de Carabobo

Secretaria de redacción

Prof. Jesús A. Zambrano R.

Facultad de Ciencias de la Educación, Universidad de Carabobo

Consejo Editorial

Freddy Rojas

Universidad Simón Bolívar

Katuska Peña

Universidad Nacional Experimental Francisco de Miranda

Madelen Piña

Universidad de Carabobo

Magaly Briceño

Universidad Experimental Simón Rodríguez

Ruth Díaz Bello

Universidad Central de Venezuela

Laybet Colmenares

Universidad de Carabobo

Comité asesor honorario internacional

Dr. Julio Cabero Almenara

Universidad de Sevilla, España

Dr. Francisco Martínez

Universidad de Murcia, España

Dr. Julio Barroso

Universidad de Sevilla, España

Dr. Álvaro Galvis Panqueva

Metacursos, USA

Dra. María del Carmen Llorente

Universidad de Sevilla, España

Dra. Magda Julissa Rojas Bahamón

Universidad de la Amazonia, Colombia

MSc. Diego Felipe Arbeláez

Grupo Lenguajes, Representaciones y Educación

Dr. Roberto Arboleda Toro

ACESAD, Colombia

Dra. Verónica Marín

Universidad de Córdoba, España

Asesor legal: Dra. Aura Piña R.

Comisión de Arbitraje

Hyxia Villegas
Universidad de Carabobo
Freddy Jara
Universidad de Carabobo
Xavier Vargas
Universidad de Carabobo
Juan Manzano
Universidad de Carabobo

Raymond Marquina
Universidad de los Andes
Adelfa Hernández
Universidad Central de Venezuela
Salomón Rivero
Universidad Nacional Experimental Francisco de
Miranda

Traductor y redacción en inglés:

Juan Carlos Briceño y Melba Noguera
Universidad de Carabobo

Autoedición versión digital
Francisco Antonio Ponte-Rodríguez
Universidad de Carabobo

Dirección de la Revista: Apartado de Correo 3812, Oficina de correos Trigal Sur, Valencia, Edo. Carabobo. Venezuela.

Correo electrónico: revistaeduweb@gmail.com

La revista Eduweb es una publicación trimestral editada por la Universidad de Carabobo. Es una publicación de ámbito nacional e internacional indizada en el índice de Revistas Venezolanas de Ciencia y Tecnología REVENCYT, en el Catálogo LATINDEX, Actualidad Iberoamericana, Dialnet, Red Iberoamericana de Innovación y Conocimiento Científico REDIB, y en Emerging Sources Citation Index.



Los contenidos de los trabajos publicados en la revista son de entera responsabilidad de los autores.

Versión electrónica de la Revista:

<http://revistaeduweb.org>

Esta edición se produce bajo el auspicio del Consejo de Desarrollo Científico y Humanístico y la Dirección de Postgrado de la Facultad de Ciencias de la Educación de la Universidad de Carabobo.

DE LOS FINES Y PROPÓSITOS DE EDUWEB, REVISTA DE TECNOLOGÍA DE INFORMACIÓN Y COMUNICACIÓN EN EDUCACIÓN

Eduweb, la revista de Tecnología de Información y Comunicación en Educación, es una publicación de carácter nacional e internacional de divulgación del conocimiento, del uso, aplicación y experiencias de las Tecnologías de la Información y Comunicación (TIC) en ambientes educativos. Con la revista se pretende divulgar las innovaciones que en materia de TIC están siendo implementadas y ensayadas en los diferentes niveles y modalidades del sistema educativo venezolano e iberoamericano. De igual manera contribuir a proyectar las experiencias de estudiantes de pre y postgrado, docentes, investigadores y especialistas en TIC en educación en la Universidad de Carabobo y en otras universidades de Venezuela y de otros países de Iberoamérica. Es una revista arbitrada e indexada adscrita al programa de la especialización en Tecnología de la Computación en Educación, de la Facultad de Ciencias de la Educación de la Universidad de Carabobo, registrada bajo el ISSN 1856-7576. Editada en formato impreso y digital.

Visión

Ser un espacio académico-científico de difusión y divulgación de las distintas tendencias del pensamiento universal ubicadas en el área de TIC en ambientes educativos, con altos niveles de calidad académica.

Misión

Promover y facilitar la difusión y divulgación de los productos de las investigaciones y experiencias de los docentes e investigadores de la Universidad de Carabobo y otras universidades del país y del mundo en el área de TIC en ambientes educativos; motivar la participación en redes comunes de información y publicación nacional e internacional; coordinar esfuerzos y velar por la calidad de las publicaciones a fin de procurar elevar el nivel académico del personal docente y de investigación mediante el desarrollo de trabajos de investigación como función esencial en su crecimiento académico.

Objetivos

Servir como órgano de divulgación de las TIC y su influencia en ambientes educativos. Estimular la producción intelectual no solo en los docentes e investigadores de la Universidad de Carabobo, sino también en otros centros de educación e investigación nacional e internacional.

Propiciar el intercambio cultural, académico, científico y tecnológico con otros centros de educación superior en Venezuela y el mundo.

Contenido

EDITORIAL	7
Aula virtual como recurso didáctico en la enseñanza del tópico evaluación de los aprendizajes	9
Praxis educativa a distancia en el contexto universitario para el aprendizaje permanente en Latinoamérica	19
Herramientas didácticas virtuales: la telefonía móvil como medio instruccional a nivel universitario	30
Apps gamificadas en el aula de matemáticas	37
La actitud de los docentes ante la implementación de la TIC en el proceso de enseñanza	47
Proceso educativo y emocional vivido por los adolescentes ante el fenómeno migratorio de los padres	54
Competencias digitales en estudiantes de ingeniería: Análisis del uso y percepción de herramientas tecnológicas	66
Effectiveness of using digital interactive projection media systems in teaching vocational subjects and in professional activities	88
The role of web applications in the development of multilingual competence in CLIL courses in higher education	106
Peer learning and peer assessment in institutions of higher education	119
Use of interactive technologies in an innovative educational environment	134
The role of technology in the development of higher education in Ukraine in the context of global challenges	157
Educational aspect in the legal regulation of scientific research in the constituent instruments of UN Specialized Agencies.....	167
The impact of educational programmes on building safety culture in modern society	178
Correlation between students' emotional intelligence and emotional dependency	193
The effectiveness of interactive online courses for the speech competence development in non-language-major students	204
Use of interactive electronic educational video resources for professional training of specialists.....	223
Interactive art: fueling creative development.....	239
Linguistic-literary synergies in modern Ukrainian philology	252
Socio-cultural factors influencing students' learning experience: a cross-cultural study	264
Educational aspects in the constitutional and legal provision of democratic governance under martial law: A comparative study	276
Artificial intelligence in developing doctoral students' research competencies	294

DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.0>

Cómo citar:

Medina, E. (2024). Editorial. Revista Eduweb, 18(3), 7-8. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.0>

EDITORIAL

El Profesor Tavira Sánchez, R. (2024) realizó un interesante aporte a través de la exposición de una serie de categorías de la IA y una breve explicación de las políticas de acuerdo con Elsevier -empresa mundial de análisis de información- especializada en contenido científico. Su interesante trabajo puede consultarse acorde con su licencia: CC BY- NC-ND 4.0 titulado Política editorial de Revistas con relación a la IA, este resalta que los autores son responsables del contenido de su trabajo y que estas tecnologías asistidas por la IA no deben figurar como autores o coautores, ni citarse como autores. En este sentido, nos hemos planteado un pequeño ejercicio de escritura que consistió en pedir a ChatGPT -por medio de un prompt- lo que en diseño instruccional llamamos una "instrucción" que nos dijera, en pocas palabras, algunos aspectos importantes sobre los primeros seis títulos que integran el presente número. El propósito del ejercicio es dejar explícito, que como sabemos, no se cita al utilizar IA, pero si debemos decirlo en virtud de privilegiar la integridad académica en el mundo de la investigación y divulgación del conocimiento.

Seguidamente los títulos y un brevísimo contexto generado por ChatGPT: "Aula virtual como recurso didáctico en la enseñanza del tópico evaluación de los aprendizajes" este trabajo resalta cómo las tecnologías digitales pueden potenciar la eficacia pedagógica. "Praxis educativa a distancia en el contexto universitario para el aprendizaje permanente en Latinoamérica" este escrito destaca el papel de las tecnologías digitales para ampliar el acceso a la educación y facilitar la formación continua. "Herramientas didácticas virtuales: la telefonía móvil como medio instruccional a nivel universitario" este trabajo aborda cómo este medio, accesible y ampliamente utilizado, puede mejorar la instrucción y el aprendizaje en el contexto universitario. Así también, leeremos: "Apps gamificadas en el aula de matemáticas", aquí se destaca cómo estas herramientas pueden mejorar el aprendizaje y la motivación de los estudiantes mediante la integración de elementos lúdicos en la enseñanza de una materia clave. Por su parte, "La actitud de los docentes ante la implementación de las TIC en el proceso de enseñanza" examina la actitud de los docentes frente a la implementación de las tecnologías, un factor clave para el éxito de la innovación tecnológica en la educación. Como cierre del ejercicio de estos primeros seis trabajos, presentamos el artículo titulado "Proceso educativo y emocional vivido por los adolescentes ante el fenómeno migratorio de los padres" su importancia radica en el impacto del fenómeno migratorio en el proceso educativo y emocional de los adolescentes, un tema crucial en estudios sociales y educativos. Hasta aquí la línea interpretativa según la máquina.

En adelante se mencionan los títulos que también forman parte del volumen 18 Nro. 3 con una línea interpretativa humana en vínculo con los resultados como es tradición de la Revista. Encontraremos, el documento: "Competencias digitales en estudiantes de ingeniería: Análisis del uso y percepción de herramientas tecnológicas", los resultados enfatizan sobre los futuros ingenieros las oportunidades de desarrollo en sus competencias digitales, especialmente en el ámbito académico. Otra investigación para nuestros lectores la representa: "El papel de las aplicaciones web en el desarrollo de la competencia multilingüe en los cursos AICLE de la enseñanza superior", la aplicación de una encuesta mostró eficacia del uso de aplicaciones web en los cursos para la formación tanto de la competencia lingüística como del conocimiento de las materias.

Un interesante estudio puede leerse en el "Uso de tecnologías interactivas en un entorno educativo innovador" los investigadores comprobaron el impacto de la implementación activa de tecnologías sobre las posibilidades de uso de tecnologías interactivas en un entorno educativo innovador.



Conforma este abanico de investigaciones “El papel de la tecnología en el desarrollo de la enseñanza superior en Ucrania en el contexto de los retos mundiales” este trabajo se basó en un estudio empírico sobre la introducción de las tecnologías digitales en las instituciones de enseñanza superior y en los resultados obtenidos en los países de la UE en 2022, esto les permitió la elaboración de recomendaciones para la integración de las tecnologías digitales en el proceso educativo. En adición, presentamos la producción titulada “Aspecto educativo en la regulación jurídica de la investigación científica en los instrumentos constitutivos de la Agencia Especializada de la ONU” su investigadora señala, como uno de sus resultados, que la actividad científica está regulada de manera consistente en tratados clave, especialmente en la Constitución de la UNESCO y el Estatuto del OIEA.

“El impacto de los programas educativos en la creación de una cultura de la seguridad en la sociedad moderna” esta investigación determinó que la influencia de los programas educativos en la construcción de la cultura de la seguridad está relacionada con el desarrollo del pensamiento lógico. La producción titulada “Correlación entre la inteligencia emocional de los alumnos y la dependencia emocional” exalta que, en la mayoría de los casos, se estableció que las conexiones entre los componentes de la IE se manifestaban con el nivel de autoconfianza. El tema de la enseñanza de otro idioma puede consultarse en la: “Eficacia de los cursos interactivos en línea para el desarrollo de la competencia lingüística en estudiantes no licenciados en idiomas” los resultados aportan información sobre la eficacia de los cursos interactivos en línea.

En continuidad con el tema de la tecnología y su impacto en la educación tenemos: “Uso de recursos de vídeos educativos electrónicos interactivos para la formación profesional de especialistas”, sus investigadores afirman que el uso de recursos de video educativos electrónicos interactivos para la formación profesional de especialistas ayuda a los estudiantes en la vida real. Otra investigación titulada “Arte interactivo: impulsando el desarrollo creativo”, confirma la hipótesis de la investigación y atestiguan el impacto positivo de los proyectos artísticos virtuales en el desarrollo creativo de los alumnos. En el área lingüística exponemos “Sinergias lingüístico-literarias en la filología ucraniana moderna” en sus conclusiones reflejan que el estudio de la filología ucraniana abre oportunidades para el desarrollo de la investigación científica, promoviendo el intercambio de conocimientos y el enriquecimiento de la comprensión del lenguaje y la literatura. Se suma a este número otra investigación titulada: “Factores socioculturales que influyen en la experiencia de aprendizaje de los estudiantes: un estudio transcultural” El estudio demuestra que en las universidades modernas existen numerosos casos exitosos de integración intercultural. La penúltima producción titulada “Aspectos educativos en la disposición constitucional y jurídica de la gobernanza democrática bajo la ley marcial: Un estudio comparativo” enfatiza la importancia de comprender y utilizar las disposiciones constitucionales y legales. Cerramos este número con el tema de “Inteligencia artificial en el desarrollo de competencias de investigación de estudiantes de doctorado” en este artículo los autores determinan que el nivel de competencia en investigación aumentó durante la implementación del método de uso de la IA.

Deseamos que los temas aquí expuestos resulten de gran interés para nuestra comunidad de lectores e investigadores. Disfrutemos de la lectura como el arte de comprender el mundo que nos rodea.

Elsy Medina

Universidad de Carabobo, Venezuela.




DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.1>

Cómo citar:


Linares Robles, F.M., & Meléndez Sánchez, N.J. (2024). Aula virtual como recurso didáctico en la enseñanza del tópico evaluación de los aprendizajes. *Revista Eduweb*, 18(3), 9-18. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.1>

Aula virtual como recurso didáctico en la enseñanza del tópico evaluación de los aprendizajes

Virtual classroom as a teaching resource in teaching the subject evaluation of learning

Francis Mercedes Linares Robles <https://orcid.org/0000-0002-7374-0304>
linaresfrancis2@gmail.com

Universidad de Carabobo, Facultad de Ciencias de la Educación, Docente, Valencia, Venezuela.

Nathalie Joelia Meléndez Sánchez <https://orcid.org/0009-0008-3951-7070>
melendezsn11@gmail.com

Universidad de Carabobo, Facultad de Ciencias de la Educación, Docente, Valencia, Venezuela.

Recibido: 24/04/24

Aceptado: 25/06/24

Resumen

Encontrar elementos innovadores, metodologías de trabajo y recursos digitales que impulsen la consolidación de esquemas de trabajos educativos efectivos, prácticos, duraderos y a la vanguardia de los nuevos tiempos se hace cada vez más presente en las instituciones de educación superior. El presente artículo tiene como propósito presentar la experiencia obtenida con los estudiantes de la asignatura práctica profesional II a través de un aula virtual orientada a la enseñanza del tópico evaluación de los aprendizajes con diferentes materiales educativos, dicha aula se enmarcó como un recurso didáctico de apoyo a las clases presenciales, bajo la modalidad b-learning durante el periodo lectivo I-2022 con soporte de la plataforma Google Classroom. El estudio se sustentó en un diseño no experimental de campo y tipo descriptivo, la recolección de los datos se obtuvo a partir de la técnica de la encuesta y como instrumento el cuestionario constitutivo de catorce preguntas cerradas. Finalmente, se valora positivamente el aula virtual como recurso didáctico, pues se considera útil para reforzar temas abordados en las sesiones presenciales, siendo un medio complementario de la enseñanza y aprendizaje con mayor flexibilidad que permite mejorar el rendimiento académico y aumentar la motivación.

Palabras clave: Aprendizaje, aula virtual, enseñanza, recurso didáctico, TICS.

Abstract

Finding innovative elements, work methodologies, and digital resources that drive the consolidation of effective, practical, and long-lasting educational work schemes, at the forefront of the new times, is becoming increasingly present in higher education institutions. The purpose of this article is to present the experience obtained with the students of the professional practical subject II through a virtual classroom oriented to teaching the topic evaluation of learning with different educational materials, said classroom was framed as a didactic support resource to face-to-face classes, under the b-learning modality during the I-2022 school year with support from the Google Classroom platform. The study was based on a non-experimental field design and descriptive type, the data collection was obtained from the Survey Technique



and as an instrument the questionnaire consisted of fourteen closed questions. Finally, the virtual classroom is valued positively as a teaching resource, as it is considered useful to reinforce the topics addressed in the face-to-face sessions, being a complementary means of teaching and learning with greater flexibility, which allows improving academic performance and increasing motivation.

Keywords: Learning, virtual classroom, teaching, teaching resource, TICS.

Introducción

La sociedad del conocimiento y el avance de las nuevas tecnologías exigen de la educación y todo su espectro cambios significativos que contribuyan al fortalecimiento, de los procesos de enseñanza y aprendizaje, en este sentido, las Tecnologías de la Información y Comunicación (TICS) cumplen un papel preponderante, pues ahora son fundamentales en el proceso de aprendizaje (Melo et al., 2020). Es por ello, la necesidad de encontrar elementos innovadores, metodologías de trabajo y recursos digitales que impulsen la consolidación de esquemas de trabajo educativos cada vez más efectivos, prácticos, duraderos y a la vanguardia de los nuevos tiempos. Por ello, los docentes están llamados a asumir los retos que implica esta inserción de las TICS en el campo educativo, teniendo presente en su gestión las formas de acceso al conocimiento para hacerlas cada vez más dinámicas e interactivas y así estar en correspondencia con las demandas de una población que presenta necesidades educativas enmarcadas en la era digital. Asimismo, durante el trayecto formativo del futuro profesional de la docencia es necesaria la consolidación de procesos que serán indispensables dentro de su quehacer diario. En este sentido, la evaluación se constituye como uno de los aspectos más relevantes de los procesos de enseñanza y aprendizaje, ya que permite valorar los alcances de los objetivos de aprendizaje establecidos y ser una de las competencias y habilidades pedagógicas más importantes del perfil docente.

De lo anterior, es preciso señalar que desde un tiempo se han observado en los estudiantes de la carrera docente, específicamente los cursantes de la asignatura Práctica Profesional II de la Facultad de Ciencias de la Educación debilidades en relación al tópico evaluación de los aprendizajes, al no diferenciar el evaluar del calificar y no reconocer, construir y aplicar instrumentos de evaluación en sus ensayos pedagógicos y prácticas desarrolladas en los contextos reales de aprendizaje, además de la necesidad de incorporar espacios digitales que les permitan gestionar y reforzar los conocimientos.

El presente artículo tiene como propósito presentar la experiencia obtenida en este curso a través de un aula virtual orientada a la enseñanza del tópico evaluación de los aprendizajes con diferentes materiales educativos computarizados constitutivos de subtemáticas como la construcción de instrumentos de evaluación, dicha aula se enmarcó como un recurso de apoyo a las clases presenciales, bajo la modalidad b-learning durante el periodo lectivo I-2022 en el entorno de las aplicaciones de Google, específicamente Google Classroom.

Cabe destacar que dicha investigación se enmarca en el paradigma positivista, de tipo descriptiva, apoyado en un diseño no experimental, al analizar cómo el aula virtual se convirtió en un recurso didáctico favorecedor y de gran ayuda para el aprendizaje de los estudiantes cursantes de la práctica profesional II de la Facultad de Ciencias de la Educación de la Universidad de Carabobo. Por tanto, se obtuvieron resultados positivos, destacando la permanente participación de los estudiantes, aprovechamiento de las potencialidades que brindan las TICS y la consolidación de estrategias didácticas digitales, en tanto que se favoreció de manera significativa en el abordaje y gestión del tópico evaluación como una de las debilidades más destacadas no solo de los docentes en formación, sino también de aquellos que se encuentran activos en el ejercicio profesional.

Finalmente, el estudio permite divulgar una experiencia de aprendizaje mediados por las TICS a través de un aula virtual y analizar el papel que éstas cumplen en la educación superior actual, siendo una estrategia didáctica que puede ser de interés para los profesionales de la docencia interesados en integrar los medios



digitales en sus prácticas y para aquellos encargados de consolidar tópicos elementales de la carrera docente como lo es la evaluación en sus estudiantes.

Revisión de literatura

El apartado que a continuación se presenta da cuenta de la revisión literaria que sirvió como base a la investigación, además de las teorías que permiten sustentar el estudio en relación al aula virtual como recurso didáctico en la enseñanza del tópico evaluación de los aprendizajes en los estudiantes de la asignatura práctica profesional II de la Facultad de Ciencias de la Educación.

El aula virtual de aprendizaje

En los últimos años, los esfuerzos en materia educativa se han centrado en seguir metodologías que fortalezcan los aprendizajes de manera significativa y al tiempo pogan en práctica recursos didácticos que sean motivadores, despertando el interés de los estudiantes, la participación activa, la colaboración entre ellos y estrategias enmarcadas en una era cada vez más digitalizada, acortando la brecha entre la educación tradicional y las nuevas tendencias, lo cual exige de los docentes permanente actualización, convirtiéndose en constructores y diseñadores de espacios o entornos de aprendizaje que complementen la presencialidad o sean gestionados a distancia.

En este sentido, el aula virtual como entorno educativo, se constituye como un medio que facilita los procesos de enseñanza y aprendizaje con el apoyo de herramientas tecnológicas, permitiendo la interacción entre los docentes y sus facilitadores, fortaleciendo así la autonomía y la accesibilidad a una infinidad de recursos educativos a través del internet. A su vez, “se entiende aula virtual como el espacio simbólico en el que se produce la relación entre los participantes en un proceso de enseñanza y aprendizaje para interactuar entre sí y acceder a la información relevante” (Gómez & Cevallos, 2019, p. 50.) Esta información se encuentra principalmente disponible en la web, por lo que la virtualidad en este tipo de escenarios es lo que marca la diferencia entre un aula tradicional y un aula virtual, siendo una fuente que permite enriquecerla.

Es de hacer notar, las aulas virtuales han experimentado un exponencial crecimiento en las últimas décadas, especialmente acelerado por la pandemia del COVID-19, ya que esta inesperada situación provocó el distanciamiento físico entre los actores educativos, lo que llevó a un drástico cambio de un aula tradicional a un espacio virtual que permitirá desarrollar los procesos pedagógicos desde la distancia, potenciando mejora e innovación en la educación. Precisamente, un elemento que caracteriza a este tipo de espacios es que no tiene límites físicos, la disponibilidad de su uso radica en el acceso a los componentes informáticos.

Por otra parte, existen tres tipos de aspectos que caracterizan los escenarios virtuales de aprendizaje tales como: las herramientas de comunicación, las cuales representan el eje central de estos ambientes, pues permiten la interacción entre los participantes y el intercambio de la información, los contenidos de aprendizaje orientados a dar respuesta al diseño instruccional y gestión de los cursos en cuanto a la accesibilidad de los mismos (Williams et al., 2001).

Entre las ventajas que ofrecen este tipo de escenario educativo es el hecho que puede facilitar la formación profesional y personal, disminuyendo los impedimentos en cuanto a tiempo y distancias. Romero (2020) señala como beneficios de los entornos virtuales de aprendizaje:

- Favorece la inclusión digital de los alumnos y profesores, además de estimular la enseñanza semi-presencial, haciendo las clases más dinámicas.
- Para los profesores, estos ambientes posibilitan diferentes tipos de aprendizajes: cooperativo, orientado al diálogo, por proyectos y por desafíos/problemas/casos.
- Actúan como un soporte para el desarrollo de prácticas pedagógicas multidisciplinarias permitiendo difundir información a un gran número de personas al mismo tiempo, sin límites geográficos.



- Proporcionan información en el mismo sistema, haciendo posible la actualización, almacenamiento, recuperación y distribución de contenido de forma instantánea sincrónica o asíncrona.
- Suministran acceso fácil a la información, pues no se depende de un espacio ni tiempo fijo. Los estudiantes tienen la libertad de estudiar en su propio ritmo independientemente de dónde estén.
- La producción de conocimientos se da de forma colectiva, ampliando las experiencias educativas y estimulando la colaboración entre los participantes. (Romero, 2020)

Es así como estos espacios desecadenan aprendizajes significativos a través de actividades interactivas que se adaptan a los intereses de los educandos con contenidos multimediales existentes y el registro sistematizado de procesos individuales (Flores Mammani, 2021). Por estas razones, en los últimos años las instituciones de educación superior han incorporado las aulas virtuales a las metodologías de trabajo, diversificándolas y al mismo tiempo ampliando su oferta formativa.

Plataforma google classroom como recurso de aprendizaje

Existe una variedad de plataformas para desarrollar las aulas virtuales, estas ofrecen diversas funcionalidades y están disponibles en diferentes formas y tamaños, facilitando la interacción entre docentes y estudiantes desde los contextos educativos en línea. Dentro de las ofertas gratuitas disponibles en la web con relación a estas aplicaciones destinadas para la educación a distancia se encuentra Google Classroom, siendo una plataforma integral que facilita la creación de sesiones de aprendizaje a través de los entornos digitales, permitiendo la participación y colaboración activa de los estudiantes con el uso de múltiples herramientas de aprendizaje como imágenes, videos, presentaciones y a su vez permite enlazar con otras herramientas de aprendizaje para apoyar los procesos y la gestión del conocimiento.

Dentro de este marco, en los últimos años esta plataforma ha sido ampliamente utilizada con un exponencial uso durante el confinamiento por Covid-19 durante los años 2020 y 2021, por su versatilidad, dinamismo y accesibilidad. Se trata, pues, de un recurso creado en el año 2014 que forma parte de la variedad de aplicaciones que ofrece de forma gratuita Google, en especial para el sector educativo (Google Apps for Education), caracterizado para ser empleado bajo la modalidad b-learning, la cual consiste en combinar encuentros asincrónicos con encuentros sincrónicos, ofreciendo versatilidad y dinamismo. Al respecto, “en la actualidad se ha visualizado la importancia de Google Classroom, como herramienta versátil en el campo educativo, que brinda numerosas ventajas como herramienta en los entornos tecnológicos digitales” (Gómez, 2020, p. 4)

Como parte de las bondades que ofrece la plataforma Google Classroom, la Universidad Autónoma de México (2020) señala las siguientes:

- Permite matricular estudiantes de forma sencilla, ya sea con su correo electrónico o a través de un código de automatriculación que se les comparte.
- Facilita el debate y la colaboración.
- Automatizar algunos procesos, pues al crear un curso, se genera una organización en Drive, con una carpeta general por cursos y subcarpetas por cada actividad.
- Crear un calendario propio de la asignatura.
- Evaluar y brindar retroalimentación general para todo el grupo, por equipos y de manera individual a las actividades realizadas por los estudiantes.
- Fomentar la comunicación, ya que permite enviar notificaciones a los estudiantes e iniciar debates rápidamente.
- Tienen acceso a todos los materiales en un solo lugar.

De lo anterior, tomando en consideración todas estas ventajas, se empleó esta plataforma como recurso didáctico del tópico de evaluación de los aprendizajes para los estudiantes cursantes de la práctica profesional II de la Facultad de Ciencias de la Educación, integrando aplicaciones de Google Docs para



crear y compartir contenido con los estudiantes, así como videos con lecciones compartidas a través de enlaces. Por otro lado, se compartió el espacio con otros docentes a fin de enriquecer el aula virtual.

El diseño Instruccional

De acuerdo con Schlosser & Simonson (2002), un modelo de diseño instruccional representa un marco referencial o proceso sistemático para llevar a cabo una instrucción de manera directa o mediada, en este sentido, para el diseño del aula virtual se consideró el modelo de diseño instruccional propuesto por Heinich, Molenda, Russel y Smaldino. (2002), mejor conocido por sus siglas en inglés como ASSURE. Este modelo tiene sus raíces teóricas en el constructivismo por el énfasis que se pone en el logro de los objetivos de aprendizaje, partiendo de las características concretas del estudiante, sus estilos de aprendizaje y fomentando la participación de sus miembros.

En este marco, el dicho diseño asegura el uso efectivo de los medios en la instrucción, siendo útil para guiar y asegurar la planificación sistemática paso a paso de los procesos de enseñanza y aprendizaje que se dan en un aula convencional; sin embargo, para Heinich, Molenda, & Smaldino (2002) representa una guía valiosa para planear y conducir la enseñanza y el aprendizaje apoyado en las TICS, además sostienen que es de gran utilidad para aquellos docentes que empiezan a poner en práctica la tecnología, pudiéndose adaptar fácilmente a la planificación de cursos y programas académicos a distancia.

El modelo ASSURE presenta seis fases o procedimientos que a continuación se mencionan:

1. Analizar las características del estudiante o de los participantes del curso.
2. Establecer los objetivos de Aprendizaje.
3. Seleccionar las tecnologías, medios y materiales.
4. Utilizar los medios y materiales representados en la cuarta etapa.
5. Participación de los estudiantes.
6. Evaluación y revisión de la implementación/ resultados de aprendizaje.

Teorías relevantes

Tomando en cuenta el contexto de la investigación, se consideraron las siguientes teorías que sustentan el aula virtual como recurso didáctico:

Teoría del procesamiento de la información de Robert Gagné

Es una teoría sistemática que contempla dos principales corrientes: la conductista y la cognoscitivista, ya que, por un lado, relaciona las respuestas producidas por un estímulo y, por el otro, se centra en el procesamiento de la información. Considera el aprendizaje como un cambio en la capacidad o disposición humana relativamente duradera. Para Gagné, el aprendizaje es algo que toma lugar dentro de la cabeza de la persona, en el cerebro. El fundamento básico de esta teoría es que para lograr ciertos resultados de aprendizaje tales como información verbal, habilidades intelectuales, cognitivas, motoras y actitudes se requieren de una serie de condiciones:

- a) Condiciones de fenómenos externos existentes en el contexto de aprendizaje (Instrucción).
- b) Condiciones de fenómenos internos que pueden favorecer un óptimo aprendizaje.

En relación con lo anterior, esta teoría señala que en el proceso de aprendizaje tiene relevancia los fenómenos internos como la percepción selectiva, la atención, la memoria a corto plazo y el almacenamiento en la memoria a largo plazo, así como el feedback, hecho externo que facilita el refuerzo. Por otra parte, se establecen los aspectos que intervienen para que el sujeto asimile la información, los cuales se describen a continuación:



- **Receptores:** se refiere a cualquier tipo de elemento que altere los receptores sensoriales encargados de llevar la información al cerebro.
- **Registro sensorial:** es la información ingresada al cerebro dependiendo del tipo de estímulo e información.
- **Memoria a Corto Plazo:** es una memoria que está activada durante un periodo corto.
- **Memoria a largo plazo:** almacena recuerdos a largo plazo que pueden prolongarse desde unos pocos días hasta décadas.
- **Generador de Respuestas:** son las acciones que se producen desde la información almacenada.
- **Control Ejecutivo:** son las habilidades que nos permiten regular nuestro comportamiento.
- **Expectativas:** se refiere a las motivaciones tanto internas como externas que se tienen para aprender algo.



Figura 1. Modelo de Procesamiento de la Información según Gagné.

Fuente: Rubio, 2018.

Este modelo se puede explicar como el ingreso de la información a un sistema estructurado por medio de los receptores (órganos sensoriales), donde esa información será codificada y modificada a través de su paso por algunas estructuras hipotéticas y luego se produce la emisión de una respuesta, en todo este proceso se considera la motivación tanto intrínseca como extrínseca que preparan o estimulan a la persona para que pueda codificar y decodificar la información. Por lo tanto, los fenómenos internos y externos se llevan a cabo en una secuencia lógica que consiste en captar la atención, informar al aprendiz del objetivo, evocar los conocimientos previos, presentar material de estímulos (contenidos), suministrar guías de aprendizaje, proponer realimentación, valorar el rendimiento, aumentar la retención y transferencia. En cuanto a los elementos que constituyen los fenómenos internos, se describen en fases o etapas que forman el acto de aprender y se describen a continuación:

1. **Fase de motivación:** corresponde a la existencia de la promesa de un refuerzo, expectativa, entre otras para el estudiante, es un llamado de la atención.
2. **Fase de atención y percepción selectiva:** donde la atención y sus mecanismos se dirigen hacia un elemento que debe ser aprendido para percibir los elementos destacados de la situación.
3. **Fase de adquisición:** es muy importante la codificación, ya que permitirá el paso de la memoria a corto plazo a largo plazo.
4. **Fase de retención:** la información es procesada dentro de la memoria a corto plazo para determinar la permanencia en la memoria a largo plazo de forma indefinida o con desvanecimiento progresivo.
5. **Fase de Recuperación de la Información:** interviene la acción de estímulos externos, ya que a veces es necesario recuperar la información desde la memoria de largo plazo.
6. **Fase de Generalización:** es la aplicación de lo aprendido a una gran cantidad de situaciones variadas.
7. **Fase de desempeño:** en esta etapa se verifica si la persona ha aprendido, dando como supuesto el hecho de que ya recibió la información.

8. **Fase de retroalimentación:** aquí se confirman las expectativas de refuerzo, utilizando variadas opciones.

En el contexto de la investigación, la teoría del aprendizaje de Gagné permitió la organización del aula virtual a partir del enfoque cognitivo, facilitando la integración de nuevos esquemas que se integraron al conocimiento existente una vez realizada las actividades interactivas propuestas, además de tomar en consideración lo motivacional como estímulo en los estudiantes para la construcción de aprendizajes significativos. Por otra parte, se tomó en cuenta las fases que forman parte del acto de aprender, dando de esta manera las pautas para seleccionar y desarrollar el contenido, siendo de gran ayuda a la hora de hacer el diseño.

Metodología

El estudio se sustentó bajo una investigación de diseño no experimental de campo y tipo descriptiva, donde se analizó la experiencia obtenida después de haber empleado medios digitales para mediar los aprendizajes a través de un aula virtual diseñada a partir de la plataforma Google Classroom, en la cual se realizó una única medición de variables, característico del diseño empleado (Hernández-Sampieri & Mendoza, 2018).

Dichos resultados se obtuvieron para extraer conclusiones de carácter general. Para el estudio se contó con una población de 62 estudiantes de la Facultad de Ciencias de la Educación de la Universidad de Carabobo, cursantes de la asignatura práctica profesional II, de la cual se tomó una muestra no probalística (Hernández-Sampieri & Mendoza, 2018), de 24 estudiantes, seleccionada de manera intencionada por tener disponibilidad tecnológica y ser participantes del 9no semestre, penúltimo de nivel de la carrera Licenciatura en Educación.

Para la recolección de la información se utilizó la técnica de la encuesta y como instrumento el cuestionario constitutivo de 14 preguntas cerradas aplicado en un único momento enviado en formato digital a través de la propia aula virtual.

La investigación se desarrolló en tres fases, la **fase 1** consistió en explorar las necesidades de los estudiantes de la práctica profesional II, diseñar el aula virtual para desarrollar el tópico evaluación de los aprendizajes y realizar las preparaciones previas a su uso. Cada estudiante tenía acceso al aula a través de un código compartido por correo electrónico, así como un manual en formato PDF que contenía información, normas, horarios y ayuda para encontrar rápidamente la información de interés. Durante la **fase 2** se realizó la construcción del cuestionario en base a cuatro dimensiones claves: Educación mediada con recursos tecnológicos, experiencia en el uso del aula virtual, dificultades detectadas en el proceso de enseñanza y aprendizaje a través del aula virtual y recursos empleados durante el proceso. Finalmente, en la **fase 3** se procedió a realizar el análisis de los datos obtenidos bajo estadística descriptiva correspondiente a las experiencias de los estudiantes.

Resultados

Una vez finalizada la experiencia de aprendizaje se procedió a recabar los datos a partir del instrumento seleccionado, el cual estuvo seccionado en cuatro dimensiones, a continuación, se presentan los resultados distintivos y su interpretación descriptiva:

Tabla N° 1.
Educación mediada con Recursos Tecnológicos

Items	Porcentaje de estudiantes %
Las Tics me optimizan el tiempo	73
Las Tics me motivan para aprender	82



En el caso de la pregunta n° 1, que hacía referencia al tiempo de los estudiantes empleando el uso de las Tics para su aprendizaje, en su mayoría consideraron que éstas le permiten hacer mejor uso de su tiempo y con relación a la pregunta n° 2, una gran mayoría señaló sentirse motivados para aprender utilizando este tipo de recursos, por lo cual se considera altamente positiva la percepción de los estudiantes en cuanto al empleo de las Tics en los procesos de enseñanza y aprendizaje. En relación con lo anterior, la OEI (2021) señala que las TIC en la educación facilitan la emisión, el acceso y el tratamiento de la información de manera innovadora. Así, su integración impacta los procesos de enseñanza y aprendizaje con entornos mucho más efectivos.

Tabla N° 2.
Experiencia en el uso del Aula Virtual de Aprendizaje (AVA)

Ítems	Porcentaje de estudiantes %
El AVA fue de gran utilidad en el proceso de Enseñanza y Aprendizaje	75
Mejó el rendimiento académico con el empleo del AVA	68
El AVA me motivó a mantenerme activo y motivado	73
El AVA permite mayor organización de la información y que el proceso de evaluación sea más rápido	85
La información presentada del tópico es completa y actualizada	92
El AVA me permitió gestionar el aprendizaje de manera autónoma	73

Con la relación a esta tabla, se evidenció que el AVA fue de gran utilidad para los estudiantes en su proceso de enseñanza y aprendizaje, demostrando que en su mayoría presentaron mejoras en su rendimiento académico, incrementando la motivación y participación, además de reconocer que existe una mayor organización de la información presentada en este tipo de entornos, siendo abundante y actualizada y la realización del proceso evaluativo de manera más expedita.

Por otra parte, los estudiantes consideraron que este tipo de espacio les permite potenciar el aprendizaje autónomo. Por tanto, se considera que el AVA a través de la plataforma seleccionada, generó resultados positivos en diversos aspectos del acto pedagógico. Se destaca, las TIC en la educación virtual porque desempeñan un papel importante en los sistemas de aprendizaje. Con ellas, el estudiante puede tener un rol mucho más protagónico, al punto de convertirse en el propio artífice de su proceso educativo. Adquiere libertad para administrar su tiempo y puede asistir a las clases y realizar evaluaciones desde cualquier dispositivo (Universia, 2020).

Tabla N° 3.
Dificultades detectadas en el proceso de enseñanza y aprendizaje a través del aula virtual

Ítems	Porcentaje de estudiantes %
No se dispone de internet o datos para ingresar al AVA con frecuencia	22
Se siente incomodidad al usar este tipo de recurso virtual	18
Existen debilidades en las competencias digitales para interactuar en el aula virtual	12

Como principales debilidades se puede señalar la imposibilidad de poder conectarse a la red, ya sea por carencia de internet o datos que así lo permitan. Así lo manifiestan el 22% de los estudiantes. Otra de las dificultades expresadas radica en la incomodidad en el uso de este tipo de recurso (AVA) y un pequeño porcentaje manifiesta presentar debilidades o carencias en relación con las competencias digitales que poseen para poder interactuar con el aula de manera satisfactoria.

Sin embargo, a pesar de todos estos obstáculos, en su mayoría los estudiantes lograron superar estas dificultades para lograr cumplir con el objetivo de aprendizaje. En concordancia, “implementar las TIC en la educación virtual requiere tener en cuenta aspectos básicos para su funcionamiento. Principalmente, el uso y la disponibilidad de recursos, así como la capacitación docente” (Banco Interamericano de Desarrollo (BID), 2020, 5)

Tabla N° 4.

Recursos de aprendizaje empleados durante el proceso

Ítems	Porcentaje de estudiantes %
Fueron útiles los recursos virtuales compartidos	76
La variedad de recursos compartidos en el AVA fue fácil de emplear	68
Google Classroom es una ayuda como plataforma de aprendizaje	76

En relación con los recursos de aprendizaje empleados y compartidos en el AVA en su mayoría los estudiantes que participaron manifiestan que les fueron útiles, fácil de utilizar y adicionalmente reconocen la plataforma Google Classroom como una herramienta de ayuda para gestionar los conocimientos.

Conclusiones

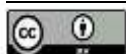
- El uso de Tics y en especial de un aula virtual de aprendizaje como recurso de apoyo a la presencialidad genera resultados positivos en diversos aspectos del acto pedagógico, como es el caso de la motivación, pues permite mayor participación y fomento de un aprendizaje activo por parte de los actores educativos.
- El AVA se valora positivamente en el contexto pedagógico y didáctico, pues se consideran útiles para reforzar temas abordados en las sesiones presenciales, siendo un medio complementario de la enseñanza y aprendizaje con mayor flexibilidad, que permite mejorar el rendimiento académico en el proceso educativo.
- Desde el contexto didáctico, el aula virtual se puede convertir en un recurso efectivo didáctico para mejorar la enseñanza y el aprendizaje, siempre y cuando exista una permanente motivación y seguimiento por parte del moderador en su uso, brindándole todas las herramientas necesarias para ello.
- La gestión pedagógica actual exige escenarios acordes a los nuevos tiempos que requieren innovación en los procesos educativos.
- El aprendizaje autónomo se ve reforzado con el empleo de entornos virtuales de aprendizaje, pues le permite al estudiante gestionar no solo los conocimientos sino también el tiempo empleado.
- El rápido acceso a la web a través del AVA proporciona mayor posibilidad de presentar información actualizada de los tópicos de aprendizaje generando de manera positiva interés en los estudiantes.
- Se presentan algunos desafíos a tomar en cuenta a la hora de emplear este tipo de recursos, considerando las condiciones y limitaciones de Venezuela en estos aspectos como lo es la disponibilidad en el acceso a la red (internet) y el desarrollo de competencias digitales por parte de todos los actores participantes en el proceso, de tal manera de optimizar el uso de la amplia gama de recursos que se encuentran en la web.
- Es necesario divulgar este tipo de estudios y socializarlos, de tal manera que puedan aportar no solo conocimientos, sino también experiencias potencialmente efectivas en otros entornos educativos.

Referencias Bibliográficas

Banco Interamericano de Desarrollo (BID). (2020). *La educación en tiempos del coronavirus: los sistemas educativos de América Latina y el Caribe ante COVID-19*. Recuperado de: <https://acortar.link/I551Ju>



- Flores Mammani, D. (2021). Efectos del aula virtual como estrategia de enseñanza-aprendizaje en el logro de aprendizajes significativos en estudiantes universitarios. *Revista De Investigaciones Interculturales*, 1(1), 19-24. <https://doi.org/10.54405/rii.1.1.9>
- Gagné, R. (1970). *Las condiciones del Aprendizaje*. Aguilar. Madrid.
- Gomez, J. M. (2020). Google Classroom: como herramienta para la gestión pedagógica. *Mamakuna*, (14), 44-54. Recuperado a partir de <https://revistas.unae.edu.ec/index.php/mamakuna/article/view/340>
- Gómez, K., & Cevallos, A. (2019). Gómez, K. y Cevallos, Á. (2019). El desafío de las nuevas tecnologías: el uso del aula virtual y su influencia en el rendimiento académico. *Rehuso*, 4(3), 48-56. Recuperado de: <https://www.redalyc.org/pdf/6731/673171023004.pdf>
- Heinich, R., Molenda, M., Russel, J., & Smaldino, S. (2002). *Intructional media and tehnology Learning*. UPPER SaddleRiver, NJ: Pearson education
- Hernández-Sampieri, R., & Mendoza, C. (2018). *Metodología de la investigación. Las rutas cuantitativa, cualitativa y mixta*. Ciudad de México, México: Editorial Mc Graw Hill Education. Recuperado de: <https://virtual.cuautitlan.unam.mx/rudics/?p=2612>
- Melo, E., Llopis, J., Gascó, J., & González, R. (2020). Integración de las TIC al proceso de educación superior: El caso de Colombia. *Journal of Small Business Strategy (archive Only)*, 30(1), 58-67. Recuperado de: <https://libjournals.mtsu.edu/index.php/jsbs/article/view/1665>
- Olivares Paizan, G., & Oliva Noa, G. (2023). Estudio comparado de la educación virtual en Cuba y América Latina: dimensiones y profesionalización docente. *Revista Científica Del Amazonas*, 6(12), 34-47. <https://doi.org/10.34069/RA/2023.12.04>
- Organización de Estados Iberoamericanos (OEI). (2021). *Los desafíos de las TIC para el cambio educativo*. Recuperado de: <https://www.oei.es/uploads/files/microsites/28/140/lastic2.pdf>.
- Romero, D. (2020). *Descubre cómo funcionan los Ambientes Virtuales de Aprendizaje (AVA) y qué aportan a la educación*. Rock Content. Recuperado de: <https://rockcontent.com/es/blog/ambientes-virtuales-de-aprendizaje/>
- Schlosser, L., & Simonson, M. (2002). *Distance Education, Definition and Glossary of Terms*. Bloomington, IN: AECT
- Universidad Autonoma de Mexico (2020). *Google Classroom*. Recuperado de: <https://educatic.unam.mx/publicaciones/infografias/infografia-google-classroom-ventajas-desventajas.pdf>
- Universia. (2020). *La importancia de las TIC en el sector educación*. <https://www.universia.net/mx/actualidad/orientacion-academica/importancia-tic-sector-educacion-1129074.html>
- Williams, P., Schrum, L., Sangrá A., & Guardia, L. (2001). *Fundamentos del diseño técnico-pedagógico en e-learning. Modelos de diseño instruccional*. España: Universidad Abierta de Cataluña. Recuperado de: <https://acortar.link/VGHNFJ>




DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.2>

Cómo citar:


Requena Negrón, I.A.E., & Pérez Márquez, J.A. (2024). Praxis educativa a distancia en el contexto universitario para el aprendizaje permanente en Latinoamérica. *Revista Eduweb*, 18(3), 19-29. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.2>

Praxis educativa a distancia en el contexto universitario para el aprendizaje permanente en Latinoamérica

Distance educational praxis in the university context for lifelong learning in Latin America

Ifigenia Alejandra Emperatriz Requena Negrón <https://orcid.org/0000-0003-2443-3815>
ifigenia.requena@gmail.com

Universidad José Antonio Páez, Valencia, Venezuela.

Juan Alexander Pérez Márquez <https://orcid.org/0000-0002-3688-6056>
juanalexanderpm@gmail.com

Universidad José Antonio Páez, Valencia, Venezuela.

Recibido: 16/05/24

Aceptado: 26/06/24

Resumen

Es una preocupación que envuelve la investigación social en Latinoamérica la necesidad de comprender el alcance que puede tener la educación permanente, conocida también como Aprendizaje a lo largo de la vida, porque sigue siendo una meta primordial para el desarrollo de ciudadanos capaces de potenciar sus habilidades y responder ante los retos que plantea una sociedad disruptiva que demanda la adaptación inmediata a los cambios suscitados. Los autores del presente artículo se han propuesto como objetivo Caracterizar la praxis de la educación a distancia para el aprendizaje a lo largo de la vida en Latinoamérica. De esta manera, se realizó una investigación de tipo documental con un nivel descriptivo, enmarcado dentro de una visión hermenéutica para comprender la realidad objeto de estudio relacionada con la formación permanente en adultos. Los investigadores pudieron encontrar que actualmente la realidad de la educación permanente latinoamericana enfrenta una serie de desafíos, los cuales derivan de diferentes perspectivas que ameritan ser consideradas para garantizar el proceso educativo. Asimismo, las experiencias de éxito en el aprendizaje permanente deben servir de inspiración para impulsar la educación que responda a las necesidades de la población adulta y la sociedad en general.

Palabras clave: Adulto aprendiz, aprendizaje a lo largo de la vida, praxis educativa a distancia, Latinoamérica.

Abstract

A concern that surrounds social research in Latin America is the need to understand the scope that permanent education, also known as Lifelong Learning, can adopt because it continues to be a primary goal for the development of citizens capable of enhancing their abilities and responding to the challenges posed by a disruptive society that demands immediate adaptation to the changes that arise. The authors of this article have proposed that their objective is to characterize the praxis of distance education for lifelong learning in Latin America. In this way, a documentary-type investigation was carried out at a descriptive level, framed within a hermeneutic vision to understand the reality under study related to



permanent training in adults. The researchers determined that the current reality of Latin American continuing education faces a series of challenges that derive from different perspectives that must be considered to guarantee the educational process. Similarly, successful experiences in lifelong learning should serve as inspiration to promote education that responds to the needs of the adult population and society in general.

Keywords: Adult learner, lifelong learning, distance learning praxis, Latin America.

Introducción

En este artículo, se abordará la Educación Permanente y de Adultos, la cual es considerada un proceso educativo integral, continuo y flexible, dirigido a personas adultas, a fin de que estas puedan desarrollar sus capacidades, conocimientos y habilidades para el pleno ejercicio de su ciudadanía. En este sentido, se abarca una amplia gama de actividades formativas, desde cursos básicos de alfabetización hasta programas de educación superior, pasando por formación profesional y capacitación laboral.

La educación para adultos, como parte de la educación permanente conforma una estructura global de aprendizaje que debe ser conducida por equipos multidisciplinarios que se encuentren motivados hacia los procesos andragógicos. Al respecto, el presente trabajo se aproxima al análisis del abordaje observado de la educación permanente en Latinoamérica, reflexionando sobre las implicaciones que ha tenido y el alcance de la educación superior a distancia en la formación permanente de adultos. La Educación reconoce que existen diferentes contextos en los cuales se puede desarrollar el proceso de aprendizaje, en este sentido, cada contexto representa el escenario donde las personas coexisten y actúan para apropiarse del conocimiento, bajo este enfoque, la educación universitaria alberga a los individuos adultos ofreciéndoles la oportunidad de formarse y adquirir conocimientos, destrezas, competencias y habilidades que le permiten enfrentar los desafíos de la sociedad a la que pertenecen y lograr para ellos su propia autorrealización.

No obstante, existen diversos factores de índole biopsicosocial que tienen una incidencia directa en el proceso de apropiación del conocimiento de los seres humanos y en especial en el individuo adulto, ya que pueden constituir barreras significativas que afectan el proceso de formación. Aun cuando está demostrado que, a lo largo de toda la vida, el ser humano es capaz de aprender, la ciencia ha realizado estudios que demuestran que los aspectos biológicos, psicológicos y sociales son diferentes en los adultos y en función de ello se deben coordinar las estrategias para favorecer el aprendizaje. En lo referente a los aspectos biológicos, los adultos sufren atenuación en sus sentidos, no obstante, esto no debe ser considerado como un impedimento absoluto para aprender, pero si amerita ser considerada esta condición para el diseño de las estrategias de aprendizajes, de modo que su impacto no desmotive al aprendiz. Afortunadamente, hay otros factores biológicos que favorecen el aprendizaje de los adultos, en este sentido, la plasticidad cerebral permite que el aprendizaje sea posible a cualquier edad. Dicho en otras palabras, “sabemos que la remodelación cerebral puede inducirse a gran escala en cualquier edad de la vida” (Merzenich et al., 2014).

Cabe destacar que, es importante que el adulto experimente un bienestar físico y mental dado que esto influye en su capacidad de aprendizaje, por lo que los ambientes afables son pertinentes en este contexto.

Con respecto a los factores psicológicos, es importante contemplar las motivaciones, debido a que el ser humano aprende cuando encuentra un propósito personal en el aprendizaje, lo que significa que, el aprendizaje debe ser realmente significativo y de valor para el aprendiz. Los adultos cuentan con más experiencia que los individuos jóvenes, lo cual representa una ventaja para conectar más rápido con el nuevo conocimiento en función de las experiencias previas.

Por otra parte, la armonía es muy importante desde el punto de vista psicológico, dando la oportunidad para que el adulto valore su autonomía y la responsabilidad de su propio aprendizaje en un escenario



idóneo. Siguiendo este orden, de los factores biopsicosociales, es oportuno acotar que, "El ser humano es un ser social por naturaleza, lo que significa que necesita interactuar con los demás para desarrollarse física y mentalmente. Esta necesidad de interacción social es fundamental para nuestro bienestar y nos permite establecer vínculos afectivos, aprender de los demás y sentirnos parte de un grupo." (Punset, 2020).

Este factor es basamento de la teoría de aprendizaje social, en la cual Bandura (1987) señala que las personas aprenden observando y modelando el comportamiento de los demás, mediante la observación, la instrucción o la imitación. Como se puede apreciar, el proceso de aprendizaje implica actividades de socialización y comunicación, que aspectos válidos para los ambientes presenciales como para los escenarios en línea, no obstante, las estrategias deben ser muy bien diseñadas para que los problemas derivados de las comunicaciones humanas no representen un obstáculo.

Según Apel y Habermas (1988), la comunicación no se trata de la simple transferencia, sino que implica la interacción y negociación de significados. De lo anterior se resalta la complejidad del proceso educativo en términos generales, empero, la realidad latinoamericana refleja otros factores que van desde lo cultural, político y económico, haciendo que sea más complejo el aprendizaje a lo largo de la vida por parte del individuo adulto, de cara a su propio desarrollo y el de la sociedad a la que pertenece.

De esta manera, surgen las siguientes interrogantes: ¿Qué tan efectivas han sido las experiencias de la educación universitaria latinoamericana en torno al aprendizaje a lo largo de la vida? ¿Qué características están presentes en la mediación a distancia en los procesos de aprendizaje a lo largo de la vida? ¿Cuáles son las acciones complementarias desde la praxis educativa a distancia para impulsar el aprendizaje a lo largo de la vida? ¿Cómo debe ser la praxis de la educación a distancia para el aprendizaje a lo largo de la vida en Latinoamérica? Se plantea como propósito general Caracterizar la praxis de la educación a distancia para el aprendizaje a lo largo de la vida en Latinoamérica, del cual se derivan objetivos específicos como son, en primer lugar, Analizar la experiencia universitaria en la educación para toda la vida en Latinoamérica, luego, describir los elementos de la mediación a distancia en procesos de aprendizaje a lo largo de la vida, y por último, identificar las acciones complementarias desde la praxis educativa a distancia para impulsar el aprendizaje a lo largo de la vida.

Revisión de literatura

Cobo y Moravec (2011) se refieren al aprendizaje informal que se produce en los ambientes informales de aprendizaje distinguiendo también lo que son ambientes de lo que es aprendizaje, extrayendo lo que se denomina aprendizaje invisible, y la incidencia que tienen los recursos de interacción, participación, intercambio que ofrecen los espacios en la red en la formación para toda la vida. Ciertamente, es importante conocer los principios que caracterizan la educación permanente, a fin de comprender la relación de la educación permanente con la educación superior a distancia. De este modo, Escotet (1991) señala como principios de la educación permanente, los siguientes:

- Es un proceso continuo que deriva de las necesidades de actualización y mejora. A su vez los planes de formación permanente pueden surgir y nutrirse de la convivencia en agrupaciones sociales. Con lo que se reafirma la necesidad de promover el saber convivir (Delors, 1996).
- La educación permanente es universal en tanto que puede producirse en cualquier parte del mundo, modalidad, entorno o canal.
- La educación es tanto integral como integrada, porque se produce a partir del saber y conocimiento de las personas.
- Es un proceso dinámico, cambiante, flexible ya que con sus medios y recursos se pretende difundir el saber en todas sus áreas de modo vigente, oportuno y práctico.

Por otra parte, la preocupación por la participación y la equidad son indicadores de la humanización en la que se basa la educación permanente. Al respecto, en el Informe mundial sobre el aprendizaje y la educación de adultos (UNESCO, 2010) se señala que los índices de participación y equidad en los países



de Latinoamérica eran muy bajos entre los años del 2007 al 2010, siendo incluso inferiores al 0,5%. Mientras que en la 5ta emisión de este informe (UNESCO, 2022) se presenta un repunte que es explicado con la expansión de la educación a distancia a partir del año 2018, indicando que esta modalidad pudo influir en el aumento en la participación de adultos en los programas de formación permanente, así como se refleja mayor atención a la equidad en la distribución del conocimiento mundial.

La UNESCO (2022) en este informe declara que no hay motivos para que exista exclusión por ningún tipo de condición, ubicación geográfica, diferencias funcionales o religión. Así mismo señala como inadmisibles la deserción. En este contexto, la praxis de la educación de adultos deriva de los principios de la andragogía y de la teoría sinérgica. Los principios de la andragogía, como son horizontalidad, participación, ergología y contrato de aprendizaje permiten dimensionar la postura del aprendiz como principal responsable de su proceso de aprendizaje. En tanto que, la horizontalidad fundamenta las características de los participantes, en el cual el estudiante es una persona adulta autorregulada, al igual que el facilitador; los dos asumen el rol desde esta perspectiva de iguales en un proceso bidireccional (Adam, 1984). La aproximación a la definición de educación a distancia y de e-learning, que, a juicio de los autores de este ensayo, son pertinentes al estudio, están representados por las siguientes conceptualizaciones:

Castillo (2007) señala la siguiente afirmación:

La educación virtual es una modalidad de la educación a distancia y abierta que en un contexto de nuevos ambientes telemáticos posibilita la comunicación humana mediada por la tecnología de información y comunicaciones, que acortan la distancia entre la enseñanza y el aprendizaje. En esta nueva forma de interacción global, profesores y estudiantes pueden compartir todo tipo de mensajes educativos en tiempo real o en forma asincrónica. El espacio donde se desarrolla la educación virtual es el ciberespacio generado por Internet. (Castillo, 2007, p. 42).

Según Moore & Kearsley (1996):

La educación a distancia consiste en un aprendizaje planificado que ocurre normalmente en un lugar diferente de aquel en que tiene lugar la enseñanza, y que requiere técnicas especiales de diseño de los cursos, técnicas instruccionales, métodos de comunicación electrónicos, así como de una organización y administración especial. (Moore & Kearsley, 1996, p. 23).

Para García Aretio (1987), se trata de un “Sistema de comunicación masiva y bidireccional que sustituye la interacción cara a cara entre el profesor y el estudiante, por la acción planificada entre los recursos didácticos y la gestión tutorial, fomentando el aprendizaje autónomo”. Por su parte, la Organización de Estados Iberoamericanos (OEI), plantea una diferenciación de valiosa consideración, de la siguiente manera:

“La enseñanza no presencial requiere metodologías de enseñanza adaptadas al uso de las TIC y a su continua innovación. El diverso uso de las TIC en la enseñanza no presencial permite diferenciar dentro de la misma varios tipos:

La enseñanza a distancia es aquella en la que para la impartición del título no se requiere la presencia física del estudiante y en el que se pueden utilizar diferentes recursos, tales como publicaciones impresas, videoconferencias, materiales digitales, así como el uso de las TIC, aunque no como medio principal.

La enseñanza en línea o virtual es aquella enseñanza no presencial que utiliza como principal medio para el desarrollo de las actividades formativas las TIC, dejando aparte las actividades de evaluación, que podrán, en su caso, organizarse de manera presencial.



La enseñanza semipresencial es aquella en la que la planificación de las actividades formativas previstas en el plan de estudios combina la presencia física del estudiante en el centro de impartición del título con el desarrollo de actividades formativas no presenciales y asincrónicas, de carácter interactivo, abierto y flexible; centradas en el alumnado, que incorporan las TIC como un soporte esencial para su desarrollo.” (OEI, s/f, p. 13)

Metodología

Para esta investigación se empleó una revisión documental, con un nivel descriptivo, centrado en el método hermenéutico para la interpretación de los textos o fuentes consultadas donde se consideran fuentes primarias como artículos científicos y de opinión que contribuyeron para la interpretación de la realidad estudiada en función de la praxis educativa a distancia en el contexto universitario para el aprendizaje a lo largo de la vida en Latinoamérica.

En relación con el sustento teórico, se basó en una revisión documental para ampliar el conocimiento del tema a fin de asumir una postura crítica y al mismo tiempo reflexiva que contribuya a la producción de nuevos conocimientos.

Por consiguiente, la investigación se enmarca bajo un enfoque cualitativo que pretende describir el fenómeno, en tal sentido, para Behar (2008) “Es un tipo de investigación cuya finalidad es proporcionar una mayor comprensión, significados e interpretación subjetiva que el hombre da a sus creencias, motivaciones y actividades culturales”. Al respecto, Corona Lisboa (2018). añade que “la investigación cualitativa no parte de supuestos verificables o hipótesis, ni de variables medibles cuantitativamente, ya que analiza información de carácter subjetiva que no es posible detectar a través de los sentidos y la inducción”. (p. 73). En atención a lo anterior, la presente investigación se enfoca en caracterizar los aspectos más importantes de la praxis educativa a distancia en el contexto universitario para el aprendizaje a lo largo de la vida en Latinoamérica

Resultados y discusión

El estudio realizado permite llegar a hallazgos resaltantes en cada uno de sus propósitos, como se describe a continuación:

Análisis de las experiencias universitaria en la educación para toda la vida en Latinoamérica

En los textos consultados, subyace la visión de la educación de adultos, especialmente a la luz la de Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura (UNESCO), se observa un rastreo de lo que fue la denominación histórica del concepto desde mediados del siglo XX. En tal sentido, en sus inicios fue denominado como Educación del Futuro (Fauré, 1973), Educación para Todos (UNESCO, 1990), Educación Permanente (Comisión Europea, 2000), también se le asoció con Educación de Adultos en la VI Conferencia Internacional (UNESCO, 2009) y hoy día se le conoce como Aprendizaje a lo Largo de la Vida, o “*Lifelong Learning*”. Sin lugar a duda, no ha sido solo un cambio en la denominación del nombre, sino también han ocurrido cambios de enfoques.

Se destacan la importancia de la educación de adultos en pro de fomentar el pensamiento crítico, la autonomía y la participación del individuo en la sociedad. Por tanto, hay que acotar que el concepto de educación de adultos no se limita a los procesos educativos meramente formales, en tal sentido, “no existe proceso educativo si no puede percibirse la apropiación paulatina de valores que garanticen una convivencia pacífica” (UNESCO, 2023).

En efecto, Milana (2018) expresa:



La educación de personas adultas, surgida como una alternativa a los modelos educativos dominantes, se ha desarrollado en el tiempo como área particular de investigación, de reflexión y de acción educativa; un área que favorece una visión de la educación como acción social. Por lo tanto, su papel ha sido interpretado, en el tiempo, así como en la geografía europea y mundial, de manera diferente ya sea compensatorio, alternativo o complementario a los modelos dominantes de educación y desarrollo social. (p. 149).

Asimismo, la UNESCO (2023) enfatiza la relevancia de la educación de adultos para la paz internacional, fundamentando la necesidad de prestar atención y promover las estrategias necesarias para que la educación esté presente en todas las etapas de la vida del individuo.

Implicaciones directas en el individuo

Habiendo analizado la importancia de la educación de adultos en el contexto social actual, se señalan aspectos claves en el desarrollo humano a partir de la educación de adultos dentro de los que se mencionan:

- Cultivar la racionalidad: es decir, ser capaz de mantener una interpretación coherente de la realidad.
- La autonomía: en este sentido, el aprendizaje permanente ofrece las herramientas para mantenerse actualizado y hacer frente a los desafíos de una sociedad disruptiva.
- Comunicación efectiva: dado que el aprendizaje se enmarca dentro del proceso educativo, siendo éste un hecho social, donde el individuo interactúa con sus pares al tiempo que aprende de ellos.
- Pensamiento crítico: la capacidad de poder generar juicios y opiniones con base al conocimiento e interpretación de los hechos.
- Desarrollo de la creatividad: la educación permanente es un medio para mantener activos los procesos de pensamiento y desarrollo creativo para que el individuo produzca soluciones a las diferentes situaciones problemáticas que pueda experimentar.

Principios claves de la educación de adultos:

De acuerdo con la UNESCO, la educación de adultos se basa en varios principios, con los cuales tanto individuos como colectividades logran desarrollar sus capacidades, actitudes, aptitudes y conocimientos. Igualmente, permite la resolución de problemas sociales del entorno de convivencia donde se ponen de manifiesto, no sólo el intelecto, sino también la afectividad, la responsabilidad social, la solidaridad y el respeto. En consecuencia, la educación de adultos se vincula directamente al mantenimiento de la paz, el desarrollo, el progreso y el respeto a los valores y modos de vida de las diferentes culturas. Lo que quiere decir que, la educación de adultos es fundamental para mejorar y reorientar competencias técnicas y profesionales, así como para participar en un desarrollo socioeconómico y cultural equilibrado e independiente. Estos principios son fundamentales para la UNESCO en su enfoque de la educación de adultos.

Experiencias en el contexto Latinoamericano

Las transformaciones globales sin precedentes que experimentan las sociedades actuales, están impulsadas por factores como la expansión del mercado global, la diversificación de la población urbana, el aumento de la migración, la movilidad y el surgimiento de una sociedad civil global. Si bien estos cambios ofrecen inmensas oportunidades, también han intensificado la pobreza, el hambre, la marginación y la desigualdad para muchas familias, por lo que, hoy más que nunca la educación permanente se constituye en la clave de los nuevos desafíos. De esta manera, algunos desafíos a superar son los siguientes:

- Falta de acceso a oportunidades de aprendizaje de calidad para muchos adultos.



- Falta de financiamiento para la educación de adultos.
- Baja calidad de la enseñanza y el aprendizaje.
- Falta de reconocimiento de la educación de adultos.
- Barreras culturales en torno al proceso de aprendizaje permanente
- Programas universitarios que atienden este sector.

De modo que, el uso de las tecnologías para la educación ha mejorado. Se puede notar la participación de países, como, por ejemplo, Cuba que sigue utilizando televisión debido a las dificultades de acceso a internet. Y en cuanto los indicadores de equidad, la tendencia sigue siendo ascendente al verificar que hay países en los que se ha venido incorporando el uso de líneas Braille y de lectores visuales para permitir el acceso de personas con condiciones visuales diversas, a los espacios virtuales de aprendizaje, a fin de incorporarlos en programas de actualización y perfeccionamiento de sus habilidades.

Otro ejemplo se encuentra en la Universidad Nacional del Litoral en Argentina (UNL), al respecto la UNESCO (2023) indica que “la UNL presenta un caso interesante de una institución que muestra un alto nivel de compromiso con el aprendizaje a lo largo de la vida sin contar con una estrategia en este sentido. Sin embargo, su larga tradición de formación continua y de inclusión de la comunidad podría materializarse de forma más eficaz” (p. 21) El autor deja ver que una aproximación con ONG, empresas privadas, instituciones públicas y comunidad en general podría representar una gran estrategia para favorecer el aprendizaje a lo largo de la vida en la población adulta.

Lo anterior indica que en la realidad latinoamericana existe la necesidad de estar a la altura de los desafíos que impone el momento actual, tal como lo confirma Tünnermann Bernheim (2022) cuando señala que “La educación superior tiene que evolucionar de la idea de una educación terminal a la incorporación en su seno del concepto de educación permanente. Esta evolución es una consecuencia de los cambios que se dan en la sociedad contemporánea, así como de la naturaleza misma del conocimiento contemporáneo, que crece y se vuelve obsoleto con extraordinaria rapidez. Todo esto repercute en el quehacer de las instituciones de educación superior y las obliga a modificar sus currículos y métodos docentes, y centrarlos en los procesos de aprendizaje más que en los de enseñanza y en una amplia formación general más que en la demasiado especializada.” (p. 122)

Elementos de la mediación a distancia en procesos de aprendizaje a lo largo de la vida

La caracterización de la educación del adulto amerita la personalización, siendo preciso responder a sus necesidades y expectativas de aprendizaje. Un adulto es capaz de desarrollar habilidades nuevas y responder favorablemente ante retos de enseñanza de acuerdo a la calidad y niveles de intercambio que se presenten como parte del ambiente de aprendizaje, (Castro Pereira, 2017). Esto quiere decir, que el adulto es capaz de responder de acuerdo con sus vivencias, esto explica que un adulto puede comportarse ante aprendizajes planteados evidenciando su progreso en relación con otras etapas de formación en su vida, de esta manera se diferencian las formas, estilos y métodos de aprender que puede alcanzar un adulto.

Para este efecto, la educación para adultos vinculada al sistema educativo general debe presentarse como un conjunto de vías alternas para alcanzar conocimientos, libres, abiertos, a partir de programas y recursos que permitan dar respuesta a necesidades de cada persona. Para la inserción del adulto en los diferentes programas de Educación permanente es importante destacar la diferenciación entre educación formal e informal. Se entiende por educación formal aquella que es planificada y organizada completamente por instituciones educativas, mientras que la educación informal es aquella en la que el adulto, interesado en el perfeccionamiento de sus capacidades hace la ruta de aprendizaje que le conviene al desarrollo de su profesión u oficio.

Además de esto, la humanización se efectúa en la medida que la persona puede internalizar y aplicar sus conocimientos en beneficio de su calidad de vida, y proveer soluciones para su entorno. Se alcanza cuando la personalidad se desarrolla con el conocimiento de sí mismo, y en la práctica de valores, a lo



largo del continuo resolver de vivencias. Las posibilidades de lograr esta humanización a partir de la educación se encuentran en proporción a la disposición existente entre organizaciones, estado y persona adulta. Las estructuras para ello han ido evolucionando y los contenidos han sido establecidos, aunque es cierto que deben ser repensados y rediseñados. Sin duda, la pandemia fue un hito que evidenció la inminencia de cambios profundos en cuanto a los abordajes educativos a distancia, provocando que la sociedad comprenda la necesidad de abordar seriamente la andragogía en educación a distancia desde sus bases para que desde la educación superior fuera posible dar respuestas a cómo alcanzar la inclusión, mejorar la participación y ofrecer alternativas de formación mediante el uso equitativo de recursos tecnológicos que apoyan la educación universal.

Acciones complementarias desde la praxis educativa a distancia para impulsar el aprendizaje para toda la vida

Si bien es cierto que a partir de la pandemia el repunte de la educación superior a distancia y a todo nivel es resaltante, tal como lo menciona García Aretio (2021), la población en general se encontraba atrapada en un tsunami, del cual no todos pudieron sobrevivir. Antes de la pandemia existían ya medios virtuales disponibles para la educación permanente a partir de Consorcios tecnológicos, MOOC, sitios como Coursera, EDX, Miríadas Actívate de Google, FATLA y otras alianzas que han surgido como iniciativas de distintas universidades del mundo. Esto reafirma el carácter convivencial y social y el principio aludido por Escotet (1991), con lo cual es importante reconocer la naturaleza educativa que se deriva de la participación en estas formaciones informales en línea, y cuya divulgación forma parte de las funciones del docente universitario.

En la educación permanente a distancia, el adulto en situación de aprendizaje evidencia características como la autogestión, la autorregulación, el autoconocimiento, tal como lo expresa Castro Pereira (2017). La educación a distancia nace con el propósito de atender diferencias, se trata entonces de educar a las personas para que sean capaces de distinguir las oportunidades de aprendizaje informal y también formal que existen en los escenarios virtuales. Por lo expuesto, la mediación debe además sustentarse en la organización sinérgica de materiales y actividades que articulen la apropiación de recursos combinados con estrategias para la modalidad educativa a distancia, todo esto obedeciendo a los enfoques teórico-inherentes a la conducción, colaboración, construcción individual y colectiva de aprendizajes significativos, la interacción y el trabajo en red.

De este modo, es fundamental para la praxis educativa a distancia, incluir la concepción del conocimiento como un proceso de interacción entre el sujeto y el medio social y cultural. De este modo se toma en cuenta, los cinco conceptos centrales planteados por Vygotsky, como son: las funciones mentales, las habilidades psicológicas, la zona de desarrollo próximo, las herramientas psicológicas y la mediación (Vygotsky, 1978). Por otra parte, una experiencia andragógica promueve el desarrollo de competencias en el estudiante a partir de su participación al favorecer la actividad independiente y sinérgica, mientras que la naturaleza de la educación a distancia le proporciona la oportunidad de construir conocimientos a partir de interacciones no necesariamente síncronas, en ambientes cuyo dinamismo debe aprehender, en los cuales su independencia de intervención es fundamental. El descubrimiento de las formas de aprender, habilidades para el aprendizaje permanente, el desaprendizaje y pensamiento crítico, son destrezas que se ven favorecidas directa o indirectamente a través de la experiencia andragógica. Estos efectos se amplían en la modalidad educativa a distancia, en la que aparecen rasgos como el compromiso, la colaboración, habilidades de búsqueda, producción de conocimiento y resolución de problemas con la selección del recurso tecnológico ajustado a las necesidades. De esta forma se visualiza la vinculación que guarda el intercambio de información, comunicación, y debate espontáneo que se genera a través de los espacios virtuales de aprendizaje, conforme a los planteamientos de Vygotsky con su zona de desarrollo próximo (ZDP) y el aprendizaje social.

En efecto, los fundamentos de la mediación se centran en la orientación adecuada, selección y diseño de recursos para apoyar el aprendizaje, así como en los enfoques educativos, curriculares, de diseño



instruccional y del diseño de ambientes para el aprendizaje. En este sentido, García Aretio (2016) y Galvis (2017) coinciden al hacer especial énfasis en cuanto a la forma como los principios pedagógicos para la mediación a distancia siguen siendo los clásicamente conocidos, como aprendizaje activo, trabajo colaborativo, constructivismo, acompañamiento, y ZDP. Todas estas premisas esenciales sustentan la implementación de las ideas más nuevas relacionadas con la interacción digital como el conectivismo de (Siemens, 2004), y esto a su vez prepara el diseño de entornos híbridos a partir de mezclas multidimensionales que respondan a las necesidades observadas, y la apropiación tecnológica conceptualizada por Fainholc (2017).

Asimismo, García Aretio (2008) propone el modelo Diálogo didáctico mediado, centrado en la importancia del diálogo, como intervención del docente, “de forma diferida al espacio y al tiempo”. Se considera esta una forma flexible de concebir el método de enseñar a distancia, con fundamento en el acercamiento pedagógico. Ahora bien, los diferentes modelos que se entrelazan en el abordaje de la educación a distancia, se subsumen del enfoque o paradigma predominante en el docente, como tutor o acompañante virtual. La experiencia en diversos roles en la gestión educativa a distancia permite asegurar que una postura ideal consiste en decantarse por delinear la transición progresiva de estrategias conductistas a constructivista, cuya didáctica se concrete a través de recursos de naturaleza conectivista.

Conclusiones

El adulto que asume la responsabilidad de su propia educación debe también desarrollar competencias para el autoconocimiento profundo, la adaptabilidad que le permita dar respuestas al entorno, la autonomía para tomar decisiones en cuanto a sus procesos de aprendizaje, la autocrítica para vigilar de forma autónoma los progresos en su plan de aprendizaje individual, y todo lo cual conlleva a que sea gestor de sus procesos de aprendizaje.

La andragogía debe ser aplicada a partir de las comprensiones y reflexiones de todo plan que sea dirigido a adultos, no solo para ampliar las oportunidades de estudio, sino para favorecer sus condiciones de aprendizaje, pues ciertamente la autonomía, el autoaprendizaje, el descubrimiento de sus propias necesidades, son postulados de Knowles cuya aplicación permite contextualizar la práctica, haciendo más significativa cada experiencia educativa.

Una praxis educativa a distancia, que fortalezca la educación permanente, ha de estar caracterizada por tener en sus bases la organización sinérgica de sus recursos, planificación flexible, impulsar la gestión autónoma, reconocer y atender las diferencias, promover el alcance de los ideales como inclusión, la masificación y la democratización, con lo cual se hace preciso contar con planes de formación del profesorado, de manera que se satisfagan las inquietudes plurales, es decir, se trata de una praxis educativa que estará bajo el acompañamiento de mentes abiertas dispuestas a aprender y aprehender indeteniblemente. Del mismo modo, resulta valioso relacionar los fundamentos andragógicos con su aplicación en el aprendizaje a distancia, y con la apropiación de las tecnologías, tomando en consideración las competencias que debe desarrollar el adulto aprendiz como parte de sus necesidades

Referencias bibliográficas

- Apel, K.-O., & Habermas, J. (1988). *The Transformation of Philosophy*. Cambridge, MA: MIT Press. 13va Edition. ISBN: 978-0262015927
- Adam, F. (1984). La Teoría Sinérgica y el Aprendizaje Adulto. *Revista de Andragogía*, 1.
- Bandura, A. (1987). *Teoría del aprendizaje social*. Volumen 4 de Espasa Universitaria Series. Psicología. 2da Edición. ISBN: 9788423965069
- Behar, D. (2008). *Metodología de la investigación*. México Editorial Shalom.
- Castillo, J. (2007). Gestión de la educación virtual. *Revista de Investigación de la Facultad de Ciencias Administrativas, UNMSM*, 10(19).
https://sisbib.unmsm.edu.pe/bibvirtualdata/publicaciones/administracion/n19_2007/a11.pdf
- Castro Pereira, M. (2017). *El adulto y su aprendizaje*. Caracas, Venezuela: Universidad Nacional Abierta.



- Cobo R., C., & Moravec, J. (2011). *Aprendizaje Invisible. Hacia una nueva ecología de la educación*. Barcelona, Seville: Publications and Editions of the University of Barcelona; International University of Andalusia.
- Comisión Europea (2000). *Memorándum sobre el Aprendizaje Permanente. sobre la educación y el aprendizaje permanente*. <https://eur-lex.europa.eu/legal-content/ES/TXT/?uri=LEGISSUM%3Ac11047>
- Corona Lisboa, J. L. (2018). Investigación cualitativa: fundamentos epistemológicos, teóricos y metodológicos. *Vivat Academia, (144)*, 69-76. <https://doi.org/10.15178/va.2018.144.69-76>
- Delors, J. (1996). *La educación encierra un Tesoro*. México: Ediciones UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000109590_spa.locale=es
- Escotet, M. (1991). *Aprender para el futuro*. Publicaciones de la Fundación Ciencia, Democracia y Sociedad. ISBN: 978-84-505-9909-2
- Fainholc, B. (2017). ¿Qué educación virtual en qué sociedad (alternativa) del conocimiento para el futuro cercano? Un aporte propositivo. *Revista de educación superior del sur global – RESUR, (4)*, e009. https://www.memoria.fahce.unlp.edu.ar/art_revistas/pr.15434/pr.15434.pdf
- Fauré, E. (1973). *Aprender a Ser: La educación del futuro*. París: UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000004743_spa
- García Aretio, L. (1987). Hacia una definición de Educación a Distancia. *Boletín informativo de la Asociación Iberoamericana de Educación Superior a Distancia, 18*, 1-9. http://old.espacio.uned.es/fez/eserv/bibliuned:20258/hacia_definicion.pdf
- _____. (2008). *Diálogo didáctico mediado*. Editorial BENED. CUED – UNED. <http://62.204.194.43/fez/eserv/bibliuned:20467/dialogodidactico.pdf>
- _____. (2016). El juego y otros principios pedagógicos. Su pervivencia en la educación a distancia y virtual. *RIED. Revista Iberoamericana de Educación a Distancia, 19(2)*, 09-23.
- _____. (2021). COVID-19 y educación a distancia digital: pre confinamiento, confinamiento y pos confinamiento. *RIED. Revista Iberoamericana de Educación a Distancia, 24(1)*. <https://www.redalyc.org/articulo.oa?id=331464460001>
- Galvis, A. (2017). *AHA, más allá de APA con AVA, donde las mezclas deben ser multidimensionales*. Capítulo III. En *Internet y educación: amores y desamores*. Virtual educa. INFOTEC Centro de Investigación e Innovación en Tecnologías.
- Merzenich, M. M., Van Vleet, T., & Nahum, M. (2014). Brain plasticity-based therapeutics. *Frontiers in human neuroscience, 8*, 385. <https://doi.org/10.3389/fnhum.2014.00385>
- Milana, M. (2018). El trabajo de la UNESCO sobre la educación de personas adultas y la educación como bien común: Aportes y reflexiones. *Revista Lusófona de Educação, (42)*, 147-160. Doi: 10.24140/issn.1645-7250.rle42.10
- Moore, M., & Kearsley, G. (1996). *Distance education: system view*. Belmont: Wadsworth Publish Hing Company.
- OEI (s.f). *Guía Iberoamericana para la Evaluación de la Educación a Distancia*. Organización de Estados Iberoamericanos para la Educación, la Ciencia y la Cultura. <https://acortar.link/usUARg>
- Punset, E. (2020). *El nuevo cerebro del emperador: Inteligencia, emoción y conciencia en el siglo XXI*. Barcelona: Planeta. ISBN: 978-84-08-24579-3
- Siemens, G. (2004). Conectivismo: Una teoría de aprendizaje para la era digital. *Conectados En El Ciberespacio, 5*, 1-10 https://ateneu.xtec.cat/wikiform/wikiexport/_media/cursos/tic/s1x1/modul_3/conectivismo.pdf
- Tünnermann Bernheim, C. (2010). La educación permanente y su impacto en la educación superior. *Revista iberoamericana de educación superior, 1(1)*, 120-133. <https://www.ries.universia.unam.mx/index.php/ries/article/view/19/73>
- UNESCO (1990). *Declaración Mundial sobre Educación para Todos: Satisfacer las Necesidades Básicas de Aprendizaje*. Jomtien, Tailandia. https://unesdoc.unesco.org/ark:/48223/pf0000127583_spa
- _____. (2009). *CONFINTEA VI: National report on the development and state of the art of adult learning and education, ALE, 2009*. Documento en línea Conferencia Internacional de Educación de Adultos, 6th, Belém do Pará, Brazil, 2009. <https://unesdoc.unesco.org/ark:/48223/pf0000214472.locale=es>



- _____. (2010). *Informe Mundial sobre el aprendizaje y la educación de adultos*. Hamburgo Alemania. <https://unesdoc.unesco.org/ark:/48223/pf0000189407.locale=es>
- UNESCO (2022). *5to. Informe mundial sobre el aprendizaje y la educación de adultos*. Educación para la ciudadanía: empoderar a los adultos para el cambio. Hamburgo Alemania. <https://unesdoc.unesco.org/ark:/48223/pf0000381666.locale=es>
- UNESCO (2023). *Prácticas institucionales sobre la implementación del aprendizaje a lo largo de la vida en la enseñanza superior*. Informe de Investigación. Instituto para el Aprendizaje a lo Largo de Toda la Vida. <https://unesdoc.unesco.org/ark:/48223/pf0000388283.locale=es>
- Vygotsky, L. S. (1978). *Pensamiento y lenguaje*. Madrid: Paidós. ISBN: 9788449323980




DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.3>

Cómo citar:


Rodríguez, A., Corral, Y., & Alonzo, L. (2024). Herramientas didácticas virtuales: la telefonía móvil como medio instruccional a nivel universitario. *Revista Eduweb*, 18(3), 30-36. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.3>

Herramientas didácticas virtuales: la telefonía móvil como medio instruccional a nivel universitario


Virtual teaching tools: mobile telephony as an instructional medium at the university level

Argenis Rodríguez <https://orcid.org/0009-0002-1737-2436>
sinegra53@gmail.com

Universidad de Carabobo. Facultad de Ciencias de la Educación, Departamento de Ciencias Agógicas, Profesor, Valencia, Venezuela.

Yadira Corral <https://orcid.org/0000-0003-2236-1328>
yjcorral@gmail.com

Universidad de Carabobo. Facultad de Ciencias de la Educación, Departamento de Ciencias Agógicas, Profesor, Valencia, Venezuela.

Liliana Alonzo <https://orcid.org/0000-0001-5305-0704>
euzkadi1978@gmail.com

Universidad de Carabobo. Facultad de Ciencias de la Educación, Departamento de Ciencias Agógicas, Profesor, Valencia, Venezuela.

Recibido: 16/05/24

Aceptado: 28/06/24

Resumen

Se ha evidenciado la utilidad de los dispositivos de telefonía celular móvil como medio instruccional accesible para la enseñanza aprendizaje en general. Sin embargo, es de provecho conocer cómo pueden servir de ayuda en el ámbito universitario. El presente artículo se propone, de forma sucinta, analizar las herramientas didácticas virtuales empleadas a través de la telefonía móvil como medio instruccional de apoyo en el proceso de enseñanza aprendizaje a nivel universitario. Metodológicamente, se trata de una investigación documental descriptiva. Se concluye que la telefonía móvil proporciona un instrumento educativo importante en la mediación del aprendizaje entre docentes y estudiantes, así como también con otros individuos en el contexto educativo.

Palabras clave: Educación superior, herramienta didáctica, herramientas virtuales, medio instruccional, telefonía móvil.

Abstract

The usefulness of mobile cellphone devices as an accessible instructional medium for teaching-learning in general has been demonstrated. However, it is advantage to know how they can serve of help in the university environment. This article proposes, by way of succinct, to analyze the virtual teaching tools used



through mobile telephony as an instructional means of support in the teaching-learning process at the university level. Methodologically, it is a descriptive documentary research. It is concluded that mobile telephony provides an important educational instrument in mediating learning between teachers and students, also with other individuals in the educational context.

Keywords: Higher education, instructional medium, mobile telephony, teaching tool, virtual tools.

Introducción

Cada vez más, prolifera el empleo indiscriminado de dispositivos digitales móviles por parte de los jóvenes actuales, no siempre de manera constructiva, casi exclusivamente con fines de entretenimiento, lúdicos o búsqueda. Pero más allá de servir como medio de comunicación, sería de interés darles un uso más relevante a éstos y pensarlos como herramienta útil en la enseñanza aprendizaje. Ya durante la pandemia de Covid-19, se evidenció claramente el valor de estos recursos electrónicos con propósitos educativos como salida de emergencia a crisis, circunstancias acuciantes o desastres naturales.

Señala Zamora (2019), los dispositivos informáticos y digitales móviles en educación -particularmente la telefonía celular- son capaces de brindar “una gama casi infinita de posibilidades que puede aplicar tanto dentro como fuera del aula de clases” (p. 30). Por la facilidad de acceso a los teléfonos inteligentes, de su manipulación como medio para la comunicación frecuente sin distinción de la condición socioeconómica de los usuarios, ni de edad ni sexo ni condición física. Proporcionan una manera fácil para la búsqueda de información, aun cuando existan problemas de conectividad. La amplia disponibilidad de teléfonos inteligentes (Smartphone) a nivel mundial convierten a estos dispositivos móviles en medios viables de enseñanza aprendizaje, tanto en el aprendizaje online como en las aulas regulares, para proporcionar apoyo a la enseñanza, en específico, en el ámbito universitario.

Sobresale la utilidad de la telefonía móvil en la enseñanza aprendizaje (Salas-Rueda & Ramírez-Ortega, 2020), al facilitar la consulta de contenidos académicos; dada la diversidad de aplicaciones App, no dependientes de navegadores (pero que pueden emplear cualquier navegador), se posibilitan las interacciones y comunicaciones (sincrónicas, asincrónicas) entre enseñante-aprendientes y entre condiscípulos, lo cual viabiliza el aprendizaje colaborativo. Entre estas App empleadas mayormente con este fin instruccional (Oficina10.top, 2021) destacan: WhatsApp, Facebook Messenger, Telegram, entre otras. Siendo WhatsApp la más popular mundialmente como recurso didáctico (Linárez Ríos, 2020; Zamora Lugo, 2020).

Concretamente en las instituciones de Educación Superior venezolanas, motivado a las dificultades socioeconómicas existentes (déficit de ingresos económicos, escasez de transporte para movilizarse, etc.), se ha convertido la telefonía celular en un gran ayudante “para la facilitación de materiales y desarrollo de actividades académicas de forma remota” (Alonzo & Corral, 2022, p. 22). Se justifica este recurso como medio didáctico (Benítez & Marquina, 2018) por: el bajo costo de su utilización, las posibilidades de trabajo colaborativo y la inmediatez comunicacional.

Adicionalmente, las aplicaciones para teléfonos móviles “han tenido un aumento importante en el último tiempo, como así también la cantidad de usuarios de aparatos móviles” (Castillo Retamal, & Inostroza Domínguez, 2020, p. 147). A pesar de las controversias existentes sobre los teléfonos celulares en el aula de clase, ya se están empleando como medio educativo de enseñanza; para ello, se precisa tener claro el fin educativo y los objetivos de aprendizaje. Asimismo, en los actuales momentos estos dispositivos móviles integran interesantes funciones posibles a emplear en procesos educativos en educación superior.

Partiendo de lo desarrollado anteriormente, el artículo se propone analizar las herramientas didácticas virtuales empleadas a través de la telefonía móvil como medio instruccional de apoyo en el proceso de enseñanza aprendizaje a nivel universitario.



Marco teórico y revisión de la literatura

Herramientas didácticas virtuales

Las herramientas didácticas se pueden conceptualizar como “todo tipo de material de los que hace uso el docente, con el único objetivo de hacer el proceso de enseñanza más dinámico y pedagógico. También denominadas recursos didácticos” (Zambrano-Orellana et al., 2021, p. 29). Por su parte, Amco International Education Services (2017) las define como aquellos materiales, actividades y recursos tecnológicos empleados por los docentes en la facilitación de aprendizajes. Así, el conjunto de actividades diseñadas sirve como “timones” que direccionan el logro de las competencias y las metas educativas; en el desarrollo de habilidades y destrezas acordes a las diversas ramas del saber y de la vida cotidiana.

Por tanto, las herramientas didácticas pueden conceptualizarse como los medios comunicativos e informativos, adaptados al contexto educativo, que facilitan y dinamizan el proceso de enseñanza aprendizaje, a los fines de facilitar que la información y conceptos sean comprendidos y asimilados por los aprendientes en la ruta de construcción de conocimiento para un auténtico aprendizaje significativo.

Estas herramientas pueden ser de tipo material, intelectual, humano, social, tecnológico, virtual, cultural o de otra naturaleza. Para Susa Torres (2019), las herramientas didácticas propician en el aprendiente una apropiación mayor de contenidos disciplinares, el desarrollo de destrezas específicas, el fomento de habilidades cognoscitivas y el desarrollo de diversas pericias. Permiten la aplicación de la didáctica en el aula a través de una variedad de estrategias con el propósito de facilitar y promover aprendizajes significativos. Pueden dividirse en dos categorías (de acuerdo con su finalidad): (a) las usadas por el docente en la enseñanza y (b) las implementadas por los estudiantes en el aprendizaje, cuyo fin es aprender, reconocer y aplicar la información pertinente o contenidos apropiados, para su apropiación de manera adaptativa y flexible; transformándolos en conocimientos interiorizados en el logro de aprendizajes significativos.

En Educación Superior, se identifican entre las herramientas didácticas orientadas al estudiante (De Pedro, 2019; Pastor, 2019) en el aprendizaje colaborativo: dispositivos móviles (tabletas, teléfonos inteligentes, Apps, etc.), las TIC (Internet, Blogs, presentaciones, simulaciones), mapas mentales, filmaciones, videos, son algunas de ellas. Según Susa Torres (2019), en el contexto universitario las herramientas didácticas

No solamente permiten que el educando cree nueva información, realice y estructure representaciones gráficas, esquemas y análisis respecto a una temática en específico, sino que adicionalmente desarrolla en ellos habilidades cognitivas importantes para su proceso académico y para las actividades que se desempeñan en su labor profesional. (pp. 10-11).

Dentro del espectro de las herramientas didácticas, hoy día destacan las de naturaleza virtual, en tal sentido, Alvarado (2023) arguye:

Las herramientas didácticas virtuales para la educación son aquellas que utilizan las tecnologías de la información y la comunicación (TIC) para facilitar el proceso de aprendizaje. Estas herramientas pueden ser desde plataformas digitales hasta aplicaciones móviles, pasando por recursos multimedia, juegos interactivos, simuladores, realidad aumentada y virtual, entre otras. El objetivo de estas herramientas es ofrecer a los docentes y a los estudiantes una mayor flexibilidad, interactividad, personalización y motivación en el ámbito educativo. (p. 2).

En general, las herramientas didácticas virtuales permiten la promoción de la inclusión en el aula; así, Alvarado (2023) señala que las herramientas virtuales pueden mejorar las experiencias de aprendizaje cuando los aprendientes necesitan mayor tiempo o aprenden de forma diferente, y puede preparar al estudiantado para el mundo digital. Particularmente, cuando existen estudiantes con alguna discapacidad puede recurrirse a diversos materiales que ayuden a superar las dificultades. Por ejemplo, cuando existen dificultades visuales los audiolibros y otros documentos auditivos pueden ayudar a los estudiantes a



alcanzar la información relacionada con el tópico en cuestión; en estudiantes con problemas auditivos, los subtítulos en documentos visuales suelen ser de gran utilidad para acceder a estos contenidos.

Asimismo, es esencial que la población estudiantil universitaria, como futuros profesionales en un mundo altamente tecnificado, sea capaz de implementar herramientas tecnológicas, digitales, interactivas y/o virtuales que le permitan acceder a un mayor campo de conocimientos actualizados, con ingentes cantidades de información en diversidad de formatos, de manera competente en un universo cada vez más cambiante y demandante.

Medios instruccionales

Los medios instruccionales constituyen los canales empleados en la transmisión de información y para compartir la misma, con el propósito de facilitar los procesos de enseñanza aprendizaje. Estos pueden ser de diversa naturaleza: personas, dispositivos, artefactos o materiales; contentivos de los datos, explicaciones, reseñas o detalles sobre una temática de interés con fines de educar, instruir y/o capacitar a los aprendientes. En tal sentido, los materiales didácticos forman parte de los variados medios instruccionales que proporcionan aprendizaje y sirven de herramientas facilitadoras de información relevante y pertinente, tales como textos escritos, guías didácticas, gráficos, mapas, videos, etc. Entre ellos destacan los materiales visuales, auditivos, audiovisuales y multimedia por su valor como estimulantes del aprendizaje, por ejemplo: videos, películas y diapositivas (Grupo de trabajo Quédate, 2012). Hoy día, algunos de estos materiales pueden ser de naturaleza digital y ser compartidas a través de dispositivos tecnológicos, que se convierten así en medios instruccionales y, a la par, en herramientas didácticas; tales como Internet y la telefonía móvil, a través de diversas Apps (WhatsApp, Telegram, son algunas de ellas).

Telefonía móvil como herramienta didáctica virtual

Sostienen López-Noguero, Romero-Díaz & Gallardo-López (2023), en los nuevos contextos de la docencia universitaria, “las prácticas educativas se han tenido que adaptar a la manera en la que los estudiantes interaccionan en los nuevos entornos digitales” (Introducción, párr. 3). Siendo protagonistas innegables la telefonía móvil e Internet, como soporte trascendental de la tecnología digital por la facilidad de acceso a redes sociales, blogs, portales web, revistas, repositorios, entre otros depositarios de documentos e información actualizada y relevante.

De igual manera, los teléfonos inteligentes (Smartphone) cada vez más se encuentran presentes en la educación superior como herramienta didáctica del M-Learning (Mobile Learning), es decir, es uno de los recursos mayormente empleados para el aprendizaje y el desarrollo de competencias en los jóvenes estudiantes a través de aplicaciones, alusivo a ambientes de aprendizaje con base en la tecnología móvil. En tal sentido, es pertinente lo aludido por Alonzo y Corral (2022):

Ofrece facilidades para búsquedas, consultas y localización de información vía Internet, en contextos de restricciones, movilidad y carencias tecnológicas. Favorece el aprendizaje colaborativo, al crear espacios de encuentro y escucha; ayuda a desinhibir a estudiantes tímidos o con dificultades para interrelacionarse, entre otras bondades. (p. 25).

Asimismo, hoy día también es útil en la educación presencial como medio de apoyo y consulta en contextos de educación presencial, incorporando la virtualidad como medio de interacción entre los actores educativos y de acceso a recursos didácticos; además, para promover el aprendizaje colaborativo y la investigación. Así mismo, afirman López-Noguero et al. (op. cit.), la telefonía móvil en educación superior facilita y aporta beneficios a los procesos de enseñanza aprendizaje,

Concretamente, diferentes autores indican que estos dispositivos mejoran la motivación, la creatividad y la atención de los estudiantes, enriquecen las actividades académicas que se realizan, fomentan la autorregulación del aprendizaje y facilitan las interacciones comunicativas entre



estudiantes y profesorado, llegando a mejorar incluso el rendimiento académico en determinadas circunstancias. (párr. 10).

Sin embargo, se debe planificar cómo se emplea este medio instruccional de manera tal que no interfiera en el desarrollo de las actividades educativas, así como la capacitación de docentes y estudiantes para su uso, considerar las posibles implicaciones en la salud de académicos y aprendientes vinculados con el estrés, la ansiedad y la adicción que puedan generar un uso inapropiado de los Smartphone.

Metodología

Metodológicamente se trata de una investigación documental descriptiva (Corral de Franco, 2024), en la cual se recurrió a la revisión de documentos diversos que abordan esta temática, tanto a nivel nacional como internacional. Como técnicas operacionales se utilizó la ampliación de textos, resúmenes y subrayado; como técnica documental, se realizó el análisis documental para discriminar las fuentes adecuadas a través de la revisión profunda de documentos, su cruce y comparación.

Para ello, se localizó información pertinente principalmente en Internet, se clasificó, organizó, almacenó, seleccionó y se extrajo la información relevante; relacionándola entre sí como producto del proceso indagatorio. Con el propósito de construir y redactar el producto de divulgación con la nueva información resultante.

Resultados y discusión

Las herramientas didácticas virtuales en general, permiten promover la inclusión en el aula; pueden mejorar las experiencias de aprendizaje cuando los aprendices necesitan mayor tiempo o aprenden de forma diferente (Alvarado, 2023) especialmente cuando existe alguna discapacidad. Por tanto, es esencial que el estudiantado de Educación Superior sea capacitado en el uso herramientas digitales, interactivas y/o virtuales de manera que propicie el acceso a conocimientos y documentos actualizados en diversidad de formatos, de forma competente.

Conforme a ello, el teléfono inteligente (Smartphone) es uno de los recursos didácticos empleados con mayor frecuencia para el aprendizaje y el desarrollo de competencias a través de aplicaciones en ambientes de aprendizaje virtuales (Alonzo & Corral, 2022); por las facilidades que ofrece en la búsqueda, consulta y localización de información vía Internet y favorece el aprendizaje colaborativo.

En tal sentido, la telefonía móvil (López-Noguero et al., 2023) en educación superior aporta beneficios a los procesos de enseñanza aprendizaje porque enriquecen las actividades académicas al facilitar las interacciones entre los actores educativos, favoreciendo el aprendizaje colaborativo, la motivación y la atención estudiantil, sin importar la distancia ni el tiempo. A través de ella, es posible hacer llegar al estudiante materiales instruccionales pertinentes y adecuados, de forma remota, reduciendo el estrés y la ansiedad de docentes y aprendientes cuando se planifica el uso de este medio instruccional.

Conclusiones

Las aplicaciones utilizadas en los Smartphone (teléfonos inteligentes), son muy populares como herramienta didáctica debido al fácil acceso que proporciona, tanto a aprendientes como a enseñantes sin importar el nivel educativo, a la información, envío de materiales instruccionales y una mejor interacción entre los actores educativos, dado que posibilita la comunicación de manera inmediata, fluida y frecuente entre los miembros del grupo (docente-estudiantes y condiscípulos), agilizando la facilitación y mediación educativa.

De acuerdo con la información encontrada, la utilización de la telefonía móvil como herramienta didáctica, resulta útil como medio instruccional porque permite combinar la presencialidad con la virtualidad en las



aulas, esto implica aprovechar los beneficios brindados en la facilitación y mediación docente dada la popularidad, fácil utilización y acceso a los dispositivos telefónicos inteligentes.

La discriminación de fuentes a partir del análisis documental en esta investigación permite afirmar que resulta significativo el uso de la tecnología móvil en la educación universitaria, en particular para la conformación de comunidades académicas, entre docentes y estudiantes; lo cual genera un impacto cultural importante. Y esto se debe al uso de este dispositivo móvil, debido a que la mayoría de los estudiantes y docentes universitarios poseen habilidades para el manejo de este, lo que facilita la comunicación y el envío de información. Esta condición conceptualiza la telefonía móvil como una herramienta andragógica esencial en la educación universitaria, facilitando el envío y recepción de información académica.

Referencias Bibliográficas

- Alonzo, L., & Corral, Y. (2022). La aplicación whatsapp un recurso didáctico para la educación online. *Revista Eduweb*, 16(1), 20-27. <https://doi.org/10.46502/issn.1856-7576/2022.16.01.2>
- Alvarado, L. (2023). *Herramientas Virtuales para la Educación: qué son y por qué estudiar esta especialización*. Institución Universitaria Politécnico Granacolombiano. Recuperado de: <https://www.poli.edu.co/blog/poliverso/herramientas-virtuales-para-la-educacion>
- Amco International Education Services. (2017). *Herramientas didácticas... La mejor vía para el desarrollo de las habilidades del pensamiento y el pensamiento crítico en los niños*. Recuperado de: <https://acortar.link/VVFDn0>
- Benítez, E., & Marquina, R. (2018). El uso de WhatsApp para el acompañamiento y fomento del trabajo colaborativo en cursos virtuales de educación continua. *Revista Eduweb*, 12(1), 21-32. Recuperado de: <http://servicio.bc.uc.edu.ve/educacion/eduweb/v12n1/art02.pdf>
- Castillo Retamal, F., & Inostroza Domínguez, P. (2021). Propuesta didáctico-metodológica para el uso provechoso del teléfono celular en las clases de Educación Física. *VIREF Revista De Educación Física*, 9(3), 147-160. Recuperado a partir de <https://revistas.udea.edu.co/index.php/viref/article/view/342429>
- Corral de Franco, Y. (2024). *Técnicas e instrumentos para la recolección de información en investigación educativa y académica. Guía didáctica teórica con ejemplos de investigaciones cualitativas y cuantitativas dirigida a estudiantes-practicantes de Docencia*. Valencia, Venezuela: Universidad de Carabobo, Facultad de Ciencias de la Educación, Departamento de Ciencias Agógicas. ISBN Electrónico: 978-980-18-4411-2
- De Pedro, S. (2019, marzo 12). *¿Cómo incorporar los dispositivos móviles como ayuda en la educación ísica de los menores?* Gaptain. Recuperado de: <https://gaptain.com/blog/como-incorporar-los-dispositivos-moviles-como-ayuda-en-la-educacion-fisica-de-los-menores/>
- Grupo de trabajo Quédate. (2012). *Estrategias y metodologías pedagógicas. Para la Permanencia estudiantil en la Educación Superior*. Cúcuta, Colombia: Universidad Francisco de Paula Santander y Ministerio Nacional de Educación de Colombia.
- Linárez Ríos, Z. (2020). Uso de los recursos educativos tecnológicos en tiempos de COVID-19. *Revista Eduweb*, 14(2), 287-300. Recuperado a partir de <https://www.revistaeduweb.org/index.php/eduweb/article/view/30>
- López-Noguero, F., Romero-Díaz, T., & Gallardo-López, J. A. (2023). Smartphone como herramienta de enseñanza-aprendizaje en Educación Superior en Nicaragua. *RIED-Revista Iberoamericana de Educación a Distancia*, 26(1), 307-330. <https://doi.org/10.5944/ried.26.1.34016>
- Oficina10.top. (2021). *Las 10 mejores aplicaciones de mensajería instantánea de 2021*. Recuperado de: <https://oficina10.top/mejores-aplicaciones-de-mensajeria-instantanea/>
- Pastor, R.P. (2019). *Herramientas didácticas orientadas al estudiante y el rendimiento académico*. (Trabajo de grado de Maestría). Universidad Peruana Cayetano Heredia, Escuela de Posgrado. Recuperado de: https://repositorio.upch.edu.pe/bitstream/handle/20.500.12866/7310/Herramientas_PastorArmendariz_Roberto.pdf?sequence=1



- Salas-Rueda, R. A., & Ramírez-Ortega, J. (2020). Dispositivos móviles: ¿medios tecnológicos necesarios para transformar las actividades escolares? *Revista Eduweb*, 14(1), 132-142. Recuperado a partir de <https://www.revistaeduweb.org/index.php/eduweb/article/view/13>
- Susa Torres, S. (2019, noviembre19). *Las herramientas didácticas como facilitadoras del aprendizaje en educación superior*. (Trabajo de grado de especialización). Universidad Militar Nueva Granada, Facultad de Educación y Humanidades, Bogotá, Colombia. Recuperado de: <https://repository.unimilitar.edu.co/handle/10654/34862>
- Zambrano-Orellana, G., Moreira-Ponce, M., Morales-Zambrano, F., & Amaya-Conforme, D. (2021, abril). Recursos virtuales como herramientas didácticas aplicadas en la educación en situación de emergencia. *Polo del Conocimiento*, 6(4), 73-87. Recuperado de: <https://polodelconocimiento.com/ojs/index.php/es/article/view/2539>
- Zamora Lugo, J. A. (2020). Las ciencias naturales a través del aprendizaje móvil durante la crisis pandémica del COVID-19. *Revista Eduweb*, 14(2), 182-192. Recuperado a partir de <https://revistaeduweb.org/index.php/eduweb/article/view/23>
- Zamora, R. (2019). El M-Learning, las ventajas de la utilización de dispositivos móviles en el proceso autónomo de aprendizaje. *Rehuso*, 4(3), 29-38. Recuperado de: <https://revistas.utm.edu.ec/index.php/Rehuso/article/view/1982>




DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.4>

Cómo citar:


Vergara Rodríguez, D., Domínguez Zapatero, C., Castro López, P., & Rodríguez-Calzada, L. (2024). Apps gamificadas en el aula de matemáticas. *Revista Eduweb*, 18(3), 37-46. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.4>

Apps gamificadas en el aula de matemáticas


Gamified apps in the mathematics classroom

Diego Vergara Rodríguez <https://orcid.org/0000-0003-3710-4818>
diego.vergara@ucavila.es


Universidad Católica de Ávila, Ávila, España.

César Domínguez Zapatero <https://orcid.org/0009-0001-4013-5896>
cesar.domzap@educa.jcyl.es

IES Ribera del Duero, Burgos, España.

Patricia Castro López <https://orcid.org/0009-0007-1991-7010>
patricia.castro@ucavila.es

Universidad Católica de Ávila, Ávila, España.

Lorena Rodríguez-Calzada <https://orcid.org/0000-0002-7401-3627>
lorena.rodriguezca@uric.es

Universidad Rey Juan Carlos, Madrid, España.

Recibido: 06/06/24

Aceptado: 15/07/24

Resumen

La integración de elementos de gamificación en los entornos educativos se encuentra en constante crecimiento, siendo evidente la proliferación de aplicaciones informáticas diseñadas con este propósito. Es pertinente resaltar que, particularmente en el ámbito de las matemáticas, el panorama de opciones específicas es limitado. En este contexto, el presente estudio tiene como objetivo principal examinar el contenido y las características de las aplicaciones utilizadas en la enseñanza secundaria, en relación con los criterios fundamentales establecidos por la pirámide de Werbach & Hunter, marco de referencia en este ámbito. Para llevar a cabo este análisis se ha seleccionado un conjunto representativo de las aplicaciones más empleadas hasta la fecha en el contexto de la gamificación educativa, además de otra específicamente diseñada para el aprendizaje de las matemáticas. Los resultados obtenidos revelan un nivel adecuado de cumplimiento de los tres elementos fundamentales propuestos por dicho marco: dinámicas, mecánicas y componentes; si bien se identifican ciertas variaciones entre las distintas aplicaciones examinadas. A partir de esta evaluación, se puede concluir que se ha experimentado un notable progreso en el desarrollo y la programación de aplicaciones gamificadas, observándose una tendencia hacia la adopción de enfoques educativos atractivos y metodologías efectivas para el aprendizaje.

Palabras clave: aplicaciones de matemáticas, aprendizaje, gamificación, herramientas de gamificación, innovación en matemáticas.



Abstract

The integration of gamification elements in educational environments is constantly growing, with the evident proliferation of numerous computer applications designed for this purpose. It is pertinent to highlight that, particularly in the field of mathematics, the range of specific options is limited. In this context, the main objective of this study is to examine the content and characteristics of applications used in secondary education, about the fundamental criteria established by the Werbach and Hunter pyramid, a reference framework in this area since its conceptualization. To carry out this analysis a representative set of the most commonly used applications to date in the context of educational gamification has been selected, as well as another specifically designed for learning mathematics. The results obtained reveal an adequate level of compliance with the three fundamental elements proposed by this framework: dynamics, mechanics, and components, although certain variations are identified among the different applications examined. From this evaluation, it can be concluded that there has been notable progress in the development and programming of gamified applications, with a trend towards adopting attractive educational approaches and effective methodologies for learning.

Keywords: Gamification, gamification tools, innovation in mathematics, mathematics, applications, learning.

Introducción

El juego ha desempeñado un papel fundamental en el desarrollo humano a lo largo de la historia. Durante las etapas tempranas del crecimiento, el juego tiene una relevancia significativa, ya que no sólo constituye una fuente de entretenimiento, sino que además actúa como facilitador del proceso de aprendizaje, estimula la interacción social entre pares y contribuye al desarrollo integral de las capacidades cognitivas, emocionales y físicas del niño (Taylor & Boyer, 2020). A través de estas actividades lúdicas, se establecen los cimientos del pensamiento cognitivo de la persona, al mismo tiempo que se fomenta el desarrollo social, personal, imaginativo y creativo, proporcionando un entorno propicio para el disfrute y el aprendizaje (Gadea & Zegarra, 2022). Por consiguiente, la integración de la metodología del juego en el sistema educativo representa un recurso indispensable para mejorar el proceso de enseñanza y aprendizaje de los estudiantes. El creciente impacto de las nuevas tecnologías y las redes sociales en el ámbito infantil y adolescente constituye una oportunidad que debe ser aprovechada para alcanzar los objetivos educativos y promover el aprendizaje. La fascinación que estas generaciones experimentan por lo virtual (Flórez Arias, 2022) puede ser canalizada para impulsar su evolución cognitiva, ofreciendo una perspectiva novedosa en la transmisión de contenidos educativos.

En este contexto se acuña el término "gamificación", de origen inglés, que comenzó a ser empleado en el ámbito educativo hacia el año 2010, aunque su creación se remonta aproximadamente a 2002, atribuyéndola a Nick Pelling, programador de videojuegos (Dreimane, 2021). La finalidad principal de esta metodología radica en proporcionar una enseñanza innovadora (Ojeda-Lara & Zaldivar-Acosta, 2023), estimular la motivación, la retención de conocimientos, el esfuerzo y otras habilidades en los estudiantes, contribuyendo así a un aprendizaje significativo y duradero. Diversos autores han intentado definir este concepto. Para Ramírez (2014), la gamificación implica la aplicación de estrategias propias de los juegos en entornos que no son intrínsecamente lúdicos, con el fin de fomentar determinados comportamientos asociados al juego. Según Kapp (2012), la gamificación se sirve de la mecánica, estética y el pensamiento de los juegos para involucrar, motivar y promover el aprendizaje y la resolución de problemas. Por otro lado, Gartner (2011) la define como el uso de la mecánica del juego, como puntos, desafíos y tablas de clasificación, para transformar actividades cotidianas en experiencias lúdicas, generando motivación en los usuarios hacia el logro de objetivos.

No obstante, Marín & Hierro (2013) han formulado una definición que resalta la idea central de esta metodología como una técnica, método y estrategia integrados, cuyo propósito fundamental es transformar los objetivos educativos en una dinámica lúdica que genere una conexión especial con el alumno,



procurando así una experiencia motivadora y significativa. Cabe destacar que la gamificación no es un fenómeno exclusivo del ámbito educativo, ya que previamente a su adopción en las aulas, se ha empleado en el ámbito empresarial con la finalidad de mejorar las habilidades de los trabajadores de manera efectiva (Vázquez Cano, 2021). En la actualidad, esta metodología es ampliamente utilizada tanto en el sector industrial como en el educativo, demostrando su versatilidad y principalmente su efectividad en diferentes contextos educativos (Li et al., 2023).

Los beneficios de la gamificación han sido objeto de estudio en los últimos años (Dichev & Dicheva, 2017), evidenciando que esta metodología facilita la asimilación del conocimiento de manera más eficaz, promoviendo una experiencia educativa agradable y estimulante para los alumnos. La gamificación tiene la capacidad de mejorar el proceso educativo y potenciar los resultados del aprendizaje (Lampropoulus & Sidiropoulus, 2024). Además, fomenta el desarrollo de habilidades sociales, trabajo en equipo y prolonga la atención influyendo en la motivación de los estudiantes y en su comportamiento en el aula (Kalogiannakis et al., 2021) contribuyendo así a la mejora del rendimiento académico y la autoconfianza (Wang & Zheng, 2020). En el ámbito específico de las matemáticas, la gamificación tiene un impacto positivo en los alumnos en el proceso de aprendizaje (Hui & Mahmud, 2023). Sin embargo, puede presentar ciertas complejidades debido a la naturaleza abstracta de algunos conceptos, así como a la escasez de aplicaciones diseñadas exclusivamente para este campo. Para implementar la metodología del juego en esta disciplina, los docentes deben orientar sus estrategias hacia aplicaciones estándar de gamificación y diseñar estrategias interactivas que impulsen el aprendizaje de sus estudiantes (Hui & Mahmud, 2023).

Referentes teóricos o revisión de literatura

Para realizar este análisis, se tomará como base el estudio realizado en 2012 por Werbach & Hunter, quienes dividieron la práctica de la Gamificación en 3 elementos que se pueden observar en la Figura 1: (i) dinámicas; (ii) mecánicas; y (iii) componentes.



Figura 1. Pirámide de los Elementos de la Gamificación.

Fuente: Elaboración propia. Adaptado de Kevin Werbach (2012)

Las dinámicas constituyen la estructura fundamental del juego. Abarcan el concepto, los aspectos generales del sistema gamificado y, en última instancia, la manera en que se implementan las mecánicas

(Fernández-Arias et al., 2020). A modo de ejemplo, se puede mencionar la narrativa, las relaciones, las limitaciones y la progresión, entre otros aspectos.

Por otro lado, las mecánicas se refieren a los componentes básicos de los procesos que impulsan el desarrollo del juego, como la competencia entre jugadores y los desafíos planteados durante la actividad. Se utilizan para favorecer el compromiso y la motivación del alumnado (Zourmpakis et al., 2023).

Y, por último, en la base de la pirámide se hallan los componentes, que representan lo que se obtiene como resultado del juego, tales como la puntuación, la mejora de avatares, el avance entre niveles o los rankings. Es decir, las aplicaciones específicas y colaborativas de las dinámicas y las mecánicas (Vergara et al., 2020).

Con el fin de obtener un análisis detallado de las aplicaciones de gamificación y realizar una comparativa entre ellas, se han seleccionado varios ejemplos de cada uno de los elementos constituyentes de la pirámide de Werbach que se pueden observar en la Figura 2.



Figura 2. Ejemplos de dinámicas, mecánicas y componentes.

Fuente: Elaboración propia

Metodología

El presente estudio se basa en una revisión crítica y sistemática a partir de fuentes obtenidas de diferentes bases de la literatura científica. Se ha procedido a elaborar el análisis teniendo en cuenta que las aplicaciones diseñadas exclusivamente para el estudio de las matemáticas son poco comunes, y la mayoría de ellas están dirigidas a la introducción de conceptos en edades tempranas. Se ha seleccionado KNOWRE MATH como una de las aplicaciones específicas en este campo para realizar un análisis comparativo. Las demás herramientas de gamificación seleccionadas (Cerebriti, Educaplay o Quizizz, entre otras) desempeñan un papel complementario y facilitan la integración de las matemáticas como eje central en el desarrollo del proceso de enseñanza y aprendizaje en el aula, así como en el desarrollo integral de los estudiantes. En la Tabla 1 se pueden observar las principales características de los programas considerados en este estudio.

Para la elaboración del análisis se ha tomado como referencia la comparativa de las diferentes aplicaciones gamificadoras, previamente seleccionadas, con los elementos principales que Werbach & Hunter (2012) consideraban imprescindibles para conseguir una experiencia lúdica en el proceso de aprendizaje (dinámicas, mecánicas y componentes). Dicha comparativa se puede observar en la Tabla 2.

La elección de estas aplicaciones se ha fundamentado en su capacidad para incorporar los contenidos de matemáticas de educación secundaria.









Tabla 1.
Principales características. Descripción, acceso y conectividad

APLICACIÓN	DESCRIPCIÓN	ACCESO	CONECTIVIDAD
Knowre Math	Detecta y suple las carencias de aprendizaje favoreciendo el máximo desarrollo del alumnado. Seguimiento individual y trabajo independiente con lecciones diferenciadas por niveles.	De pago	App IOS o desde la Web
Cerebriti	Juegos educativos que los pueden crear tanto el profesorado como el alumnado. Extensa base de datos de juegos interactivos de multitud de áreas.	Gratuita Posibilidad de pago para profesores con un espacio privado para hacer el seguimiento de los alumnos.	Web
Educaplay	Plataforma que permite integrar actividades lúdicas y educativas multimedia.	Gratuita. Posibilidad premium con más funcionalidades y sin publicidad.	Web
Quizizz	Portal de juegos de preguntas que permite crear, modificar y personalizar juegos, concursos o exámenes de manera lúdica. Informes individuales y generales de los resultados obtenidos.	Gratuita. Posibilidad premium para empresas.	App Android e IOS y Web
Kahoot	Plataforma educativa que permite crear cuestionarios, juegos o exámenes. Se pueden gestionar las evaluaciones o reforzar el aprendizaje del alumnado.	Gratuita. Posibilidad premium con más funcionalidades.	App Android e IOS y Web
Socrative	Herramienta multimedia que permite crear cuestionarios, evaluaciones o concursos. Seguimiento de las respuestas por parte del profesor en tiempo real.	Gratuita. Posibilidad premium con más funcionalidades.	App Android e IOS y Web
Edpuzzle	Aplicación que permite la edición de vídeos educativos, integrar cuestionarios o añadir explicaciones.	Gratuita. Posibilidad premium con creaciones y grabaciones ilimitadas.	App Android e IOS y Web
Edmodo	Red educativa global que facilita la comunicación y conexión entre el alumnado y con el profesorado. Permite compartir contenido, asignar tareas o premiar retos.	Gratuita	App Android e IOS y Web

Fuente: Elaboración propia

Tabla 2.

Análisis comparativo de aplicaciones gamificadoras aplicables a las matemáticas

		Knowre	Cerebriti	Educaplay	Quizizz	Kahoot	Socrative	Edpuzzle	Edmodo
									
DINÁMICAS	Emociones	×	×	×	×	×	×	×	
	Narración								
	Progresión	×	×	×	×	×	×	×	×
	Relaciones								×
MECÁNICAS	Colaboración						×		×
	Competición	×	×	×	×	×	×	×	×
	Desafíos	×	×	×	×	×	×	×	×
	Recompensas	×	×	×	×	×		×	
	Retroalimentación	×	×	×	×	×	×	×	×
	Suerte	×	×	×	×	×	×	×	×
	Turnos	×	×	×	×	×	×	×	×
COMPONENTES	Avatar		×		×				×
	Colecciones								
	Combate	×			×	×	×		
	Desbloqueo de contenidos	×						×	
	Equipos	×			×	×	×		×
	Gráficos sociales								×
	Huevos de Pascua								
	Insignias		×						
	Límites de tiempo	×	×	×	×	×	×	×	×
	Misiones		×					×	×
	Niveles	×							
	Puntos	×	×	×	×	×	×	×	×
	Clasificaciones y barras de progreso	×	×	×	×	×	×		×
	Regalos		×						

Fuente: Elaboración propia

Resultados y discusión

Se ha llevado a cabo un análisis individual de cada una de las aplicaciones seleccionadas y se han ilustrado en gráficas porcentuales los ejemplos cumplidos de cada elemento, tomando como la totalidad 1/3 de cada uno de los tres niveles de la pirámide de Werbach. Es decir, en la Figura 3 se puede apreciar cada una de las aplicaciones en relación con las dinámicas, las mecánicas y los componentes; asumiendo una distribución homogénea del 33% entre los 3 niveles de la pirámide de Werbach se analiza el impacto de cada elemento. En este sentido, en el caso de las dinámicas, donde todas las apps coinciden con aproximadamente el 17%, estos elementos presentan el 50% del total de posibles opciones de dinámicas planteadas en la Tabla 2 (emociones, narración, progresión y relaciones). Asimismo, se ha confeccionado una tabla comparativa (Tabla 3) que examina el estudio de cada una de las aplicaciones gamificadoras en matemáticas con los elementos mencionados.

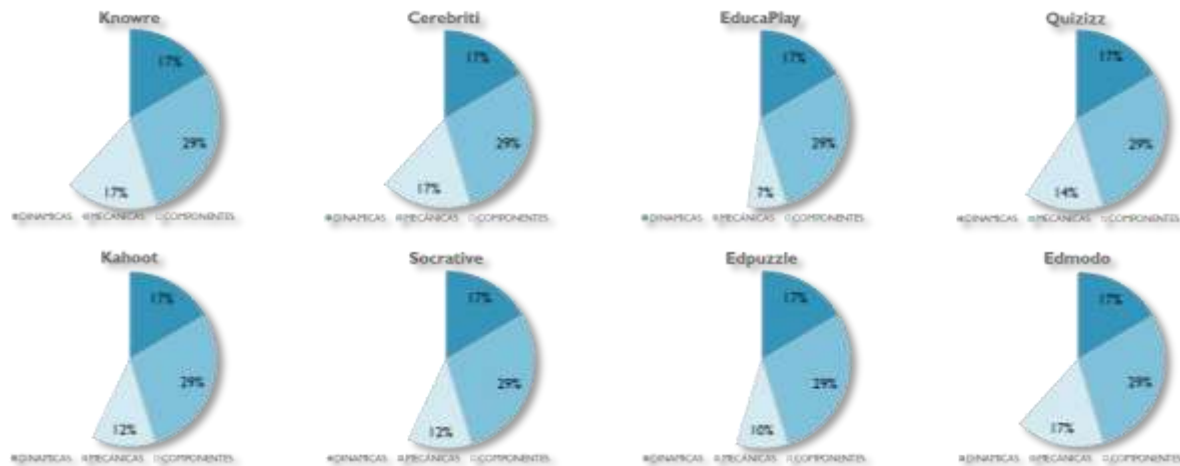


Figura 3. Distribución de elementos de cada nivel de la pirámide de Werbach en las aplicaciones analizadas.

Fuente: Elaboración propia.

Los resultados obtenidos, respecto a las *dinámicas*, reflejan que el 50% de los elementos analizados favorecen las emociones y la progresión, centrándose en la curiosidad, la competitividad, la felicidad e incluso la frustración en el alumnado. Es significativo que el 100% de las aplicaciones carecen del elemento narrativo, clave para ayudar al alumno a dar una continuidad a la historia y favorecer así su aprendizaje. No obstante, dicha carencia narrativa repercute en la necesidad y posibilidad de personalización del juego por parte del docente, permitiéndole ampliar las opciones y ajustarlas a los diferentes niveles educativos. Asimismo, todas y cada una de las aplicaciones, dan importancia al elemento de la progresión, al desarrollo del juego y a la evolución del propio alumno. En cuanto al componente de las relaciones, sólo Edmodo favorece las interrelaciones y la comunicación entre los participantes (representando un 12,5% de la muestra). Por tanto, después de examinar las diferentes aplicaciones, se observa que todas ellas poseen la capacidad de reajuste y personalización por parte del profesorado. Esto permitirá al docente adaptar su uso a los contenidos pertinentes con el objetivo de sumergir al estudiante en una narrativa única y emocionante.

En cuanto al elemento de las *mecánicas*, se observa que todas las aplicaciones seleccionadas cumplen en gran medida con los ejemplos establecidos (con un 86% de cumplimiento). Este hecho lleva a concluir que la estrategia de involucrar al alumnado en el proceso de aprendizaje a través de elementos lúdicos está ampliamente dominada y reconocida por parte de los desarrolladores de aplicaciones. Esto se traduce en una fuerte atracción por parte del alumno hacia el contenido educativo integrado en la gamificación. Es significativo añadir que el 75% de las aplicaciones no incluye el elemento del trabajo colaborativo (Tabla 2), fomentando el aprendizaje individual y el 25% no da importancia a la recompensa inmediata reflejada en los beneficios por conseguir logros. Por tanto, la competitividad, los desafíos y el progreso individual se erigen como pilares fundamentales de dicha atracción por parte del alumnado.

Tabla 3.
Comparación analítica de las aplicaciones gamificadoras en matemáticas

			Knowre	Cerebriti	EducaPlay	Quizizz	Kahoot	Socrative	Edpuzzle	Edmodo
			> 90	90 > x > 70	70 > x > 40	< 40				
DINÁMICAS	Emociones	Curiosidad, competitividad, frustración, felicidad								
	Narración	Una historia continuada es la base del proceso de aprendizaje	50%	50%	50%	50%	50%	50%	50%	50%
	Progresión	Evolución y desarrollo del jugador/alumno								
	Relaciones	Interacciones sociales, compañerismos, estatus, altruismo								
MECÁNICAS	Colaboración	Trabajar juntos para conseguir un objetivo								
	Competición	Unos ganan y otros pierden. También contra uno mismo								
	Desafíos	Tareas que implican esfuerzo, que supongan un reto								
	Recompensas	Beneficios por logros	86%	86%	86%	86%	86%	86%	86%	86%
	Retroalimentación	Cómo lo estamos haciendo								
	Suerte	El azar influye								
	Turnos	Participación secuencial, equitativa y alternativa								
COMPONENTES	Avatar	Representación visual del jugador								
	Colecciones	Elementos que pueden acumularse								
	Combate	Batalla definida								
	Desbloqueo de contenidos	Nuevos elementos disponibles tras conseguir objetivos								
	Equipos	Trabajo en grupo con un objetivo común								
	Gráficas sociales	Representan la red social del jugador dentro de la actividad								
	Huevos de Pascua	Elementos escondidos que deben buscarse	50%	50%	21%	43%	36%	36%	29%	50%
	Insignias	Representación visual de los logros								
	Límites de tiempo	Competir contra el tiempo y con uno mismo								
	Misiones	Desafíos predeterminados con objetivos y recompensas								
	Niveles	Diferentes estadios de progresión y/o dificultad								
	Puntos	Recompensas que representan la progresión								
	Clasificaciones y barras de progreso	Representación gráfica de la progresión y logros								
	Regalos	Oportunidad de compartir recursos con otros								

Fuente: Elaboración propia

Y por último, respecto a los *componentes*, se observa un descenso en relación con los anteriores



elementos. Sólo entre un 21-50% de las aplicaciones cumplen con los elementos de la pirámide que se han seleccionado para el análisis. Esta discrepancia se atribuye a la diversidad de aplicaciones que gamifican el contenido educativo, lo que implica que no todas sigan un mismo prototipo ni utilicen las mismas estrategias para atraer al alumnado en el proceso de aprendizaje. Asimismo, destacar que tanto la limitación del tiempo, como la obtención de puntos, se encuentran en todas las aplicaciones. Este hecho genera en el alumno un incentivo más por la competición, ya sea hacia uno mismo o hacia los compañeros. Además, las recompensas en forma de puntuación y la visualización de los progresos constituyen incentivos adicionales para estos sentimientos asociados a los juegos y competiciones, lo que los convierte en enfoques de enseñanza atractivos y potencialmente adictivos.

En síntesis, considerando cada uno de los elementos, todas las aplicaciones valoran la progresión y el desarrollo del alumno, permitiendo al profesor la personalización del aprendizaje y su reajuste cuando sea preciso. Además, promueven el aprendizaje individual y la competitividad, siendo un elemento esencial para atraer al alumno. Asimismo, el hecho de la incorporación del límite de tiempo o la obtención de puntos, genera un incentivo más, haciendo que esta metodología de enseñanza sea muy atractiva.

Conclusiones

La gamificación y la implementación de las TIC en el aula permiten adaptar y crear nuevo contenido que resulta beneficioso y motivador para el aprendizaje del alumno. La incorporación de esta metodología basada en el juego dentro del aula de matemáticas se ha convertido en una herramienta fundamental para ayudar al profesor a atraer la atención del alumno y favorecer así su motivación para aprender mejor.

El análisis del contenido y de las características de las aplicaciones utilizadas en la enseñanza secundaria (en relación con los criterios fundamentales establecidos por la pirámide de Werbach) muestra grandes beneficios significativos en el aprendizaje del alumno en el aula de matemáticas. Tanto la gamificación como la implementación de apps educativas conceden gran importancia a la progresión del alumno, brindando al docente la oportunidad de adaptar las actividades en función de las necesidades y de la evolución del aprendizaje.

Los resultados tras el estudio de cada una de las aplicaciones gamificadoras en matemáticas señalan que presentan el 86% de los elementos de las mecánicas, el 50% de las dinámicas, y entre un 21% y un 50% de los componentes. Concretamente, todas las aplicaciones estudiadas fomentan el aprendizaje individual, la competitividad y los desafíos, hecho imprescindible para ayudar a captar el interés del alumno. No obstante, solo una de las aplicaciones analizadas (Edmodo) fomenta la interacción y la comunicación entre los alumnos implicados. Asimismo, los incentivos y el conocimiento de la propia progresión convierten esta metodología en un enfoque más atractivo y adictivo para el propio alumno.

Referencias bibliográficas

- Dichev, C., & Dicheva, D. (2017). Gamifying education: what is known, what is believed and what remains uncertain: a critical review. *International journal of educational technology in higher education*, 14, 1-36. <https://doi.org/10.1186/s41239-017-0042-5>
- Dreimane, S. (2021). Gamification before its definition – An overview of its historical development. *INTED2021 Proceedings*, 7187-7193. <https://doi.org/10.21125/inted.2021.1434>
- Fernández-Arias, P., Ordóñez-Olmedo, E., Vergara-Rodríguez, D., & Gómez-Vallecillo, A. I. (2020). La gamificación como técnica de adquisición de competencias sociales. *Revista Prisma Social*, (31), 388-409.
- Flórez Arias, N. A. (2022). Pensar la virtualidad desde la didáctica. Reflexión crítica de los entornos virtuales de educación. *Actualidades Pedagógicas*, 1(77), 6. <https://doi.org/10.19052/ap.vol1.iss77.6>
- Gadea, L. G., & Zegarra, N. G. (2022). Resiliencia, juego y creatividad: puntos clave en el desarrollo humano. *Avances en Psicología*, 30(1), e2516-e2516. <https://doi.org/10.33539/avpsicol.2022.v30n1.2516>



- Gartner (2011). *Maverick Research: Motivation, momentum and meaning: How Gamification can inspire engagement*. United Kingdom: Gartner Research.
- Hui, H. B., & Mahmud, M. S. (2023). Influence of game-based learning in mathematics education on the students' cognitive and affective domain: A systematic review. *Frontiers in psychology, 14*, 1105806. <https://doi.org/10.3389/fpsyg.2023.1105806>
- Kalogiannakis, M., Papadakis, S., y Zourmpakis, A.-I. (2021). Gamification in Science Education. A Systematic Review of the Literature. *Education sciences, 11(1)*, 22. <https://doi.org/10.3390/educsci11010022>
- Kapp, K. M. (2012). *The gamification of learning and instruction: game-based methods and strategies for training and education*. John Wiley & Sons.
- Lampropoulus, G., & Sidiropoulus, A. (2024). Impact of Gamification on Students' Learning Outcomes and Academic Performance: A Longitudinal Study Comparing Online, Traditional, and Gamified Learning. *Education Sciences, 14(4)*, 367. <https://doi.org/10.3390/educsci14040367>
- Li, M., Ma, S., & Shi, Y. (2023). Examining the effectiveness of gamification as a tool promoting teaching and learning in educational settings: a meta-analysis. *Frontiers in Psychology, 14*, 1253549. <https://doi.org/10.3389/fpsyg.2023.1253549>
- Marín, I., & Hierro, E. (2013). *Gamificación: El poder del juego en la gestión empresarial y en la conexión con los clientes*. Madrid, España: Empresa Activa, 152.
- Ojeda-Lara, O. G., & Zaldívar-Acosta, M. D. S. (2023). Gamificación como Metodología Innovadora para Estudiantes de Educación Superior. *Revista Tecnológica-Educativa Docentes 2.0, 16(1)*, 5-11. <https://doi.org/10.37843/rted.v16i1.332>
- Ramírez, J. L. (2014). *Gamificación: mecánicas de juegos en tu vida personal y profesional*. Alpha Editorial.
- Taylor, M. E., & Boyer, W. (2020). Play-based learning: Evidence-based research to improve children's learning experiences in the kindergarten classroom. *Early Childhood Education Journal, 48(2)*, 127-133. <https://doi.org/10.1007/s10643-019-00989-7>
- Vázquez Cano, E. (2021). *Medios, recursos didácticos y tecnología educativa*. Editorial UNED.
- Vergara, D., Mezquita, J. M. M., Valecillo, A. I. G., & Fernández-Arias, P. (2020). Sistemas de respuesta de estudiantes: evolución hacia a la gamificación. *Revista Eduweb, 14(2)*, 236-250. Recuperado a partir de <https://www.revistaeduweb.org/index.php/eduweb/article/view/27>
- Werbach, K., & Hunter, D. (2012). *For the Win: How Game Thinking Can Revolutionize Your Business*. Harrisburg: Wharton Digital Press.
- Zourmpakis, A. I., Kalogiannakis, M., & Papadakis, S. (2023). Adaptive gamification in science education: An analysis of the impact of implementation and adapted game elements on students' motivation. *Computers, 12(7)*, 143. <https://doi.org/10.3390/computers12070143>



DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.5>

Cómo citar:

Rangel, R.D. (2024). La actitud de los docentes ante la implementación de la TIC en el proceso de enseñanza. *Revista Eduweb*, 18(3), 47-53.
<https://doi.org/10.46502/issn.1856-7576/2024.18.03.5>

La actitud de los docentes ante la implementación de la TIC en el proceso de enseñanza

The attitude of teachers towards the implementation of ICT in the teaching process

Rubén Darío Rangel

<https://orcid.org/0009-0003-3345-819X>
prof.rubendariorangel@gmail.com

Universidad de Carabobo, Docente Investigador, Valencia, Venezuela.

Recibido: 15/04/24

Aceptado: 11/06/24

Resumen

La educación es la formación integral del ser humano con base en valores humanistas y, el papel de la universidad reside en la construcción profesional para servir a la sociedad con miras a construir un futuro sostenible, integrador y orientado al desarrollo de cada nación. Desde este marco experiencial, la investigación tuvo como objetivo el análisis de la actitud de los docentes ante la implementación de las TIC en el proceso de enseñanza. La investigación se fundamentó en el paradigma cualitativo de acuerdo con el método interpretativo, el análisis de contenido permitió recabar la información desde la entrevista no estructurada tras el uso de la plataforma MOODLE. Como resultado la actitud de los docentes arroja un significativo valor a la planificación adaptado a las necesidades específicas del estudiantado cuyo beneficio impacta en la experiencia de aprendizaje tras el uso de la tecnología.

Palabras clave: Actitud de los docentes, tic, proceso enseñanza.

Abstract

Education is the comprehensive formation of the human being based on humanistic values, and the university's role lies in professional construction to serve society to build a sustainable, integrative future oriented to the development of each nation. From this context, the research aimed to analyze the attitude of teachers towards implementing ICT in the teaching process. The research was based on the qualitative paradigm per the phenomenological interpretive method, the content analysis allowed information to be collected from the unstructured interview after the use of the Moodle platform. As a result, the attitude of the teachers gives significant value to the pedagogical praxis adapted to the specific needs of the students whose benefit impacts the learning experience in the context of technology.

Keywords: Teachers' attitude, ICT, teaching process.

Introducción

La era de la globalización ha traído cambios en diferentes aspectos de la vida. Desde mediados del siglo XX el conocimiento se ha convertido en un recurso clave para el desarrollo de los ámbitos: económico, político, organizativo, comunitario y educativo; obligando a la renovación de las estructuras y procesos de



todos los sistemas que conforman la sociedad. Los tiempos actuales son de profundas transformaciones en la vida del ser humano, lo que origina que constantemente se hable de crisis en los diferentes cambios de la vida social y educativa a nivel mundial.

Los constantes cambios y evolución de la sociedad respecto al uso de las tecnologías en general, y en el ámbito educativo en particular, están potenciando el hecho innegable de que es importante un uso de las TIC en la escuela, con coherencia y bien enfocado hacia una práctica efectiva. (Sáez López, 2010). Venezuela no escapa de esta realidad por lo que la educación juega un papel muy importante, dentro de esta crisis, el docente quien desempeña un rol significativo en el proceso de enseñanza – aprendizaje. En este sentido, es necesario que ellos adopten nuevas directrices en función de una mayor movilización y participación dentro de la acción educativa.

En Venezuela se han presentado a lo largo de los años cambios profundos en lo social, en lo político, en lo económico, especialmente en lo humano. Esto ha conllevado a cambios profundos en el sistema educativo en general, pero específicamente en el nivel universitario reposa la consolidación ética y profesional de construir un ser humano acorde con los retos de una sociedad contextualizada por la tecnología. Con una formación integral, que en lo ontológico posea profunda calidad humana, moral y ética en cada una de sus actitudes, con amor a la patria y a todos quienes vivimos en ella. Así también, en lo epistemológico debe adquirir un nivel de competencias en el conocimiento universal, técnico, científico y humanista que los conduzca a la reflexión. Se trata de un ser de pensamiento libre y crítico.

Todos los cambios mencionados coinciden con el inicio de un nuevo siglo, la era del conocimiento, la era de las tecnologías, y su transformación debe ir impregnada por un conjunto de postulados y acontecimientos que inducen a transformaciones substanciales en todo el sistema educativo, entre ellos los paradigmas socio-cognitivos sobre el aprendizaje; las reformas en la enseñanza universitaria; los modelos curriculares, cuyas bases socio-críticas, ecológicas, sociológicas, culturales y constructivistas promueven la formación profunda e integral de los estudiantes; de conformidad con las políticas y acuerdos nacionales e internacionales.

El modelo formativo entre muchos de sus estamentos debe responder como instrumento de análisis y de intervención en la realidad educativa, debe representar, una potente herramienta intelectual para abordar los problemas educativos, ayudándonos a establecer el necesario vínculo entre el análisis teórico y la intervención práctica. Es por lo que les corresponde a los docentes universitarios, transmitir una herencia cultural con eficiencia, competitividad, y mentalidad crítica, propiciando a su vez la autonomía social y cultural del país. Se requiere un docente calificado, motivado, reconocido por la sociedad, capaz de relacionarse con su medio social y sobre todo consciente de su responsabilidad con los estudiantes y de la unidad de su quehacer personal y profesional, como modelo de comportamiento ético para las nuevas generaciones y como orientador de la práctica pedagógica.

En este sentido es necesario tener presente que el desarrollo humano consiste en la construcción armoniosa de un conjunto de características bio-psico-socioculturales propias de toda persona, que se ponen en juego en la búsqueda de bienestar y la realización individual como colectiva. Que aborde a cada persona como un ser único, de libre pensamiento, trascendiendo el dualismo cuerpo/alma, individuo/sociedad, naturaleza/cultura, un ser humano armónico, consciente de los cambios y transformaciones del entorno social.

Con base en estos planteamientos, surge la inquietud investigativa de analizar en el personal docente de la Facultad de Ciencias de la Educación de la Universidad de Carabobo la visión de la tecnología. En virtud de ello, surge la siguiente interrogante ¿Cuál es la actitud de los docentes en este proceso educación y tecnología? Una vez analizada la interrogante surgió el objetivo de develar la actitud de los docentes ante la implementación de las TIC en el proceso de enseñanza. La importancia del estudio se justifica en la comprensión de los rasgos culturales que marcan las pautas para una praxis educativa universitaria inmersa en la sociedad de la información.



Marco teórico

(Morales, 2003), citado por Vasquez R., (2022) define la actitud como un estado psicológico interno que se manifiesta a partir de respuestas observables o vías de expresión cognitivas, afectivas y conductuales. Si bien la actitud se caracteriza por su carácter evaluativo interno, su concepción multidimensional la define conforme a tres componentes o tipos de respuesta: cognitivo, afectivo y conductual. (Eagly & Chaiken, 1993).

El estudio de la actitud de los docentes frente al uso de la tecnología ha considerado la teoría del aprendizaje significativo de Ausubel ya que se centra en el aprendizaje de materias escolares. La expresión significativo implica que se opone a lo memorístico.

Se denomina contenido significativo cuando es incorporado al conocimiento de quien aprende y que establece una relación con su conocimiento previo. D. Ausubel, J.D. Novak y H. Hanesian (1989), destacan la importancia del aprendizaje por recepción. Es decir, el contenido y estructura de la materia los organiza el profesor. En cuanto a su influencia en el diseño de software educativo referida a la instrucción programada y a la EAO, señala que se trata de medios eficaces para proponer situaciones de descubrimiento y simulaciones.

Se suman a estos aportes teóricos la teoría de (Bruner, 1988) ya que atribuye específica importancia a la acción en los aprendizajes. La resolución de problemas dependerá de cómo se presentan estos en una situación concreta, pues suponen un reto que conlleve a su resolución y transferencia del aprendizaje. (Fabre & Orange, 1997) señalan que el tratamiento didáctico de los obstáculos se realiza en el contexto de la resolución de problemas. Proponen en este sentido tres tipos de enseñanza la comprensión que es expuesta por el docente y enfrentadas por el estudiante. La resolución de problemas cuya respuesta es exclusiva del estudiante. Por último, la problematización que emplea la pregunta como técnica parcial a partir de interrogantes generalizadas.

El docente tiene un objetivo y es que pretende que los estudiantes construyan un conocimiento de forma progresiva a partir de las soluciones encontradas. De acuerdo con este planteamiento la investigación asume lo señalado por la UNESCO ya que las tecnologías digitales se han convertido en una necesidad social para garantizar la educación como un derecho humano básico, especialmente en un mundo que debe hacer frente a crisis y conflictos cada vez más frecuentes.

(Medina, 2014) refiere que un contexto didáctico apoyado en la tecnología está estructurado en acciones y saberes, al respecto enfatiza en la acción didáctica desplegada en innovaciones en la forma de enseñar y manejo de estrategias. La motivación para incrementar la creatividad del sujeto en situación de aprendizaje, así como la promoción de experiencias de bienestar y aprendizaje experiencial. La acción tecnológica está comprendida por la valoración y comprensión de los aportes tecnológicos para aumentar su uso.

La acción gnoseológica implicada en el conocimiento e importancia en la búsqueda de información veraz. Desde un escenario como la plataforma Moodle se concibe la acción comunicacional puesto que otorga especial atención a la lectura y escritura en las formas de experimentación del aprendizaje colaborativo. Como cierre de estas acciones la referida autora menciona la importancia de valores axiológicos que engloban la ética y responsabilidad.

Un interesante aporte teórico lo encontramos en (Gisbert, 1999) quien plantea que el trabajo de un ciberprofesor tiene cualidades y actitudes que lo definen, entre ellas destaca: la formación inicial, la formación permanente, el dominio de la tecnología, capacidad de adaptación y la flexibilidad, ante estas actitudes el mencionado autor enfatiza sobre el cambio imperativo de estrategias a nivel comunicacional.

En adición a estas cualidades Gisbert señala la didáctica como una dimensión importante presente en el trabajo docente, en este marco menciona la relevancia de las modalidades de formación, programación y



planificación, materiales didácticos, actividades de aprendizaje, la evaluación continua y la metodología. Tras reconocer la relevancia de la didáctica hemos considerado pertinente asumir esta conceptualización para esta investigación ya que el escenario tecnológico está representado por la actitud de los docentes frente al uso de la Plataforma Moodle como recurso tecnológico. (Mata de López & Acevedo Blanco, 2010) sugieren la necesidad de incorporar progresivamente las Tecnologías de la Información y Comunicación a sus labores académicas, a través de asignación de actividades que requieran del uso de Internet esto coincide con el concepto de fijar metas en la resolución de problemas como se ha mencionado anteriormente.

Metodología

La investigación ha sido estructurada siguiendo la forma señalada por Martínez (2004); se planteó el objetivo en el que se busca descubrir el significado conjunto de toda expresión de la vida humana tales como habla, texto y comportamiento. El método se corresponde con el hermenéutico por su capacidad de análisis de contenido y la técnica ha sido la entrevista que, una vez se identificaron los corpus lingüísticos permitieron la teorización señalada como conclusiones y sugerencias vinculadas a las actitudes expresadas por los docentes en calidad de informantes clave. De acuerdo con el paradigma cualitativo se utilizó la información suministrada para su respectivo análisis e interpretación.

Las siguientes características permitieron la utilización de la metodología cualitativa: holística porque permitió el acercamiento a informantes clave. Naturalista porque se llegó a importantes conclusiones a través de la conversación surgida en el marco de la entrevista. Comprensiva porque más que la verdad en el objeto de estudio se enfocó en la perspectiva de los actores principales que, en este caso fueron las actitudes docentes. (Monje, 2011).

El significado de las experiencias constituye el núcleo de la investigación, por ello se describió el fenómeno de estudio a partir de lo que los mismos actores comparten dialógicamente sobre sus vivencias de uso de la plataforma Moodle, específicamente a través de la voz de diez docentes entre los que destacan cinco jubilados y cinco activos.

De acuerdo con la metodología de (Martínez, 2004) se han planteado dos tipos de descripciones la primera se corresponde con la situacional y la segunda con la endógena que, su importancia radica en expresar de forma general aquello que se descubrió tras el proceso de las entrevistas. En síntesis, la investigación se estructuró según el corpus lingüístico, categorías e interpretación que dieron lugar a los hallazgos y propuesta relacionada con los aspectos didácticos en el marco de la enseñanza de cara a la tecnología. Se ha seguido la premisa del ya mencionado autor puesto que resulta fácil comprender que los procesos de estructuración y teorización dado que constituyen el corazón de la actividad investigativa e ilustran el procedimiento y el producto de la verdadera investigación, es decir, cómo se produce la síntesis teórica de todo el trabajo.

Seguidamente se han seleccionado un número específico de categorías en calidad de mostrar el proceso de estructuración que se ha seguido.



Tabla 1.
Corpus lingüístico generalizado. Estructuración.

Corpus	Tipo de respuesta. Actitud	Categoría
Estoy consciente del poco manejo que tengo de la plataforma, pero igual intento desarrollar los temas y objetivos para trabajar a distancia.	Cognitiva	Planificación de contenido
Los problemas de electricidad en la zona donde vivo cada día se convierten en el mayor obstáculo de trabajo. Aunque siempre dedico más tiempo para planificar las actividades y dejarlas previamente en la plataforma. La plataforma es muy buena y tiene distintos recursos.	Conductual	Planificación y uso de la tecnología
Mi actitud frente al uso de la tecnología es positiva pues no dudo que ayuda a nuestros estudiantes porque sabemos que la tecnología avanza sin detenimiento alguno, en ese sentido tenemos que estar actualizados.	Afectiva	Responsabilidad
Yo creo que lo más importante es la comunicación con los estudiantes, que ellos estén bien informados del objetivo de la unidad a estudiar. Prepararles las actividades y tareas para que busquen la solución con tiempo y hagan el esfuerzo por hacer las tareas de manera eficiente. Sobre todo, para que elaboren sus propios conceptos e ideas.	Cognitiva y conductual	Planificación
Una ventaja es que estamos trabajando con adultos, incluso muchos ya trabajan en el campo educativo. Entonces esto hace que nuestra práctica docente sea a partir de la andragogía y sobre esa dimensión llevar a cabo el proceso de enseñanza y aprendizaje. Tener consciencia de la importancia de mantener un trabajo colaborativo que beneficie la adquisición y dominio de conocimientos.	Cognitiva Conductual	Pedagogía andragógica Comunicación
Uno de los aspectos más difíciles que me ocurre a menudo es cuando los estudiantes me dicen que tienen que cubrir los gastos de teléfono y que quitan prestado para poder entrar a la plataforma. Eso para mi es un poco triste y bueno trato de ser lo más práctico posible para que el tiempo en la plataforma sea rápido y económico para ellos.	Afectivo	Planificación Didáctica
Mi actitud frente al uso de la plataforma en principio era negativa porque los estudiantes se quejan del tiempo, de no tener datos en su teléfono, otros se les dificulta por problemas de electricidad, en fin, un innumerable listado de inconvenientes. Sin embargo, estoy convencido de la necesidad de trabajar con lo que la tecnología nos brinda como apoyo en la enseñanza y aprendizaje.	Afectivo Conductual	Innovar Cambio de actitud
He leído sobre la importancia de la tecnología en la educación y siempre concluyo que el elemento base es la pedagogía con la que uno trabaje y convierta la clase a distancia en un momento agradable y deseo de aprender lo mejor del tema en estudio. Pienso que el estudiante sabe más que el docente pues siempre está dispuesto a enfrentar los problemas, eso justo hace que como docente no me sienta lejos de la actualidad y trato de estar a la altura de las exigencias de mis estudiantes. Conversar sobre las metas en común y poner actividades si bien realistas con la unidad curricular también de nivel que requiera un gran esfuerzo cognitivo del estudiante, esa es una garantía del verdadero aprendizaje.	Cognitivo Conductual	Comunicación Didáctica
Cuando tengo problemas con la plataforma porque por la baja conectividad no puedo, tomo la decisión de mandar las lecturas y los trabajos que tienen que hacer vía correo electrónico. Tomo esta decisión un poco arcaica, pero sin duda nos mantenemos al día con el calendario y la planificación. Siempre los estudiantes responden y logran hacer los informes o resumen que les pido. Eso si hago una discusión de los temas para que no haya dudas de quien hizo el trabajo.	Cognitiva Conductual	Comunicación Planificación
Honestamente creo que trabajar con la plataforma es práctico porque se deja todo en el bloque de trabajo. Se asignan los libros, los artículos y las presentaciones de los temas. Luego allí mismo se asignan las tareas y esto hace más eficiente la práctica pedagógica y el trabajo que tienen que hacer los estudiantes.	Cognitivo Conductual	Planificación
Particularmente puedo decir que me ha sido difícil entender la diferencia entre trabajar a distancia y la presencialidad. De modo pues que gracias a la práctica he podido concluir que trabajar con la tecnología siempre es aprovechar las oportunidades que ofrece y que son infinitas las posibilidades. Y ha sido muy rica la experiencia de conversar en el aula con todos reunidos después que han trabajado en la plataforma. Los estudiantes reconocen que el manejo del tiempo lo tienen ellos, que se pueden organizar y así tomar notas para discutirlos en clase. Casi siempre les pongo tareas exigentes que requieran conocimiento y creatividad.	Afectivo Cognitivo Conductual	Comunicación Planificación Exigencias
Yo manejo el concepto mixto entre lo que significa la plataforma y lo que significa la clase aquí en la Facultad.	Cognitivo	Planificación



Resultados y discusión

Una vez que el investigador haya determinado y organizado las categorías y propiedades que estimó y juzgó más adecuadas como elementos descriptivos, puede optar por lograr o alcanzar tales descripciones establecidas de acuerdo con la actividad prevalente que los constituye. (Martínez, 2004).

Descripción situacional

La educación venezolana en los actuales momentos está enmarcada en los procesos de cambios para adecuarse a los avances científicos, tecnológicos y humanísticos. En este sentido el sistema educativo está comprometido con la generación de acciones conducentes y pertinentes en el logro de una transformación sugerida por los nuevos tiempos y contextos. Para honrar este compromiso, se hace necesario usar en la cotidianidad escolar, herramientas para la innovación y creatividad en el campo educativo; en virtud de ello, este planteamiento requiere de un docente que desarrolle competencias innovadoras acorde con el uso y avance de la tecnología. Tal como señalan (Zatsepina et al., 2023) la educación a distancia implica recibir servicios educativos de forma remota, principalmente sin asistir físicamente a una institución de educación superior, utilizando nuevas tecnologías informáticas y de comunicación.

Descripción endógena

La investigación ha encontrado, según los informantes, que las Tecnologías de información y comunicación (TIC) ofrecen las herramientas necesarias para que los docentes estén inmersos en los diversos escenarios educativos; donde se generan nuevos retos para el abordaje de los programas educativos mediante propuestas innovadoras que van a facilitar el quehacer del docente en el ámbito educativo y cultural lo que permite el mejoramiento de la calidad educativa.

Los informantes señalan el valor educativo de la plataforma al plantear la importancia que tiene la incorporación de la praxis andragógica ya que les permite sumergirse en innovadoras formas del conocimiento a través de la comunicación interpersonal. De allí que se generen comunidades virtuales en medio de la misma plataforma Moodle. Este intercambio comunicativo permite la creación de grupos entre estudiantes y docentes proporcionando la interacción constante en el marco de la construcción de conocimientos acorde a las exigencias actuales de la sociedad marcada por el uso de la tecnología.

La implementación de la tecnología concretamente permite tener acceso a contenidos online, mejora la productividad del aprendizaje, optimiza el tiempo de instrucción, y gracias a la interacción comunicativa se alimenta el trabajo colaborativo.

Como parte de la descripción endógena se aprecian los componentes de la actitud que han sido puestos en consonancia con el corpus, de acuerdo con esto las respuestas de orden cognitivo se relacionan con las creencias y pensamientos de los docentes. El componente afectivo se vincula con las emociones y sentimientos según la experiencia vivida en los casos específicos referidos por el docente. Y sin duda, las respuestas de orden conductual son las que condujeron a los docentes a tomar decisiones que se convirtieron en acciones. Mismas que se consideran de gran relevancia ya que tales decisiones siempre tuvieron el objetivo de beneficiar el ejercicio docente permitiendo una práctica de éxito que incide positivamente en los estudiantes.

Conclusiones

La categorización ha permitido englobar las actitudes del docente frente a la necesidad de emplear la tecnología como parte de su práctica diaria, gracias a las respuestas y análisis de los corpus hemos comprobado la importancia de la planificación, sea el recurso tecnológico que se utilice. Vemos con precisión que los docentes le dan especial atención a las actividades y tareas para la resolución de



problemas que sin duda marcan el trabajo del estudiante por construir sus propios conceptos. Algunos han hablado de la importancia de la puesta en práctica de principios metodológicos para enseñar a los adultos. La planificación remite a la didáctica como parte esencial de implementar estrategias educativas que tengan en cuenta las necesidades, experiencias previas, motivaciones e intereses de los estudiantes. Sobre esta importante base se realizan las siguientes recomendaciones.

- Crear las actividades y problemas según las expectativas del modo de vida de los estudiantes. Según sus propios objetivos y percepciones que del curso tengan.
- Promover un aprendizaje autodirigido, ya que es la forma de incrementar la autonomía y responsabilidad. El estudiante fijara sus propias metas y ritmo de estudio.
- Planificar los contenidos cuya aplicación a su experiencia estudiantil los conduzca por el camino de la definición de conceptos y conocimientos sólidos sobre la materia en estudio.
- Promover experiencias de colaboración que sean transferibles del escenario de la plataforma al escenario de la clase presencial, esto en caso de trabajar bajo el concepto a distancia y presencial.
- Fijar metas de resolución de problemas que conduzcan al trabajo colaborativo donde el intercambio de conocimientos sea el objetivo principal.
- Establecer el contenido y las actividades según horarios flexibles.

En resumen, el trabajo en la Plataforma Moodle es valorado por los docentes como un espacio de enfoque educativo adaptado a las características y necesidades específicas de los estudiantes, utilizando las funcionalidades de la plataforma para crear un ambiente de aprendizaje efectivo y significativo.

Referencias Bibliográficas


- Alzate, L. A., & Gaitán Martínez, Y. M. (2024). Impacto de las TIC en la enseñanza y aprendizaje en estudiantes inclusivos del programa de Licenciatura en Informática. *Revista Científica Del Amazonas*, 7(13), 20-29. <https://doi.org/10.34069/RA/2024.13.03>
- Ausubel, D. (1976). *Psicología Educativa*. México: Trillas, S.A.
- Ausubel, D. P., Novak, J. D., & Hanesian, H. (1989). *Psicología cognitiva. Un punto de vista cognoscitivo*. México: Trillas.
- Bruner, J. S. (1988). *Desarrollo educativo y educación*. Madrid: Morata.
- Eagly, A.H., & Chaiken, S. (1993). *The Psychology of attitudes*. Orlando, FL: Harcourt. Brace, Jovanovich.
- Fabre, M., & Orange, Ch. (1997). Construcción de problemas y superación de obstáculos en Camilloni, A. (Ed. Gedisa). *Los obstáculos epistemológicos en la enseñanza* (pp. 63-89). Barcelona: Editorial Gedisa, S.A.
- Gisbert, M. (1999). *La nueva actitud del docente del futuro en Lacruz Alcocer. M.* (Ed. Universidad de Castilla). Nuevas tecnologías para futuros docentes. (pp. 305-310). Cuenca: Castilla.
- Martínez, M. (2004). *Ciencia y arte en la metodología cualitativa*. (pp. 268-274). México: Ediciones Trilla.
- Mata de López, A. I., & Acevedo Blanco, A. C. (2010). La actitud de los profesores hacia el uso de las tecnologías de la información y comunicación. *Investigación y Postgrado*, 25(2-3), 022-042. https://ve.scielo.org/scielo.php?script=sci_arttext&pid=S1316-00872010000200005
- Medina, E. (2014). *Virtualización didáctica de la planificación instruccional*. Venezuela: Editorial Dirección de medios y publicaciones de la Universidad de Carabobo.
- Monje Álvarez, C.A. (2011). *Metodología de la investigación cuantitativa y cualitativa*. Guía didáctica. Colombia, Neiva: Universidad Surcolombiana. Facultad Ciencias Sociales y humanas. Programación de comunicación social y periodismo.
- Morales, J.F. (2003). *Actitud*. En R.C. Vazquez (Coord.), Terol C., M.C., Martin-Aragon, M., De la Torre E. Ediciones Miguel Hernández (p.p 1-16). Universitat.
- Sáez López, J.M. (2010). Actitudes de los docentes respecto a las TIC, a partir del desarrollo de una práctica reflexiva. *Escuela Abierta*, 13, 37-54.
- Zatsepina, N., Borin, K., Korostel, P., Fonariuk, O., & Doronina, T. (2023). The role and impact of information technology on the educational process. *Revista Eduweb*, 17(3), 124-133. <https://doi.org/10.46502/issn.1856-7576/2023.17.03.11>




DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.6>Medina, N., Rodríguez, M., Rodríguez, Y., & Virgen, K. (2024). Proceso educativo y emocional vivido por los adolescentes ante el fenómeno migratorio de los padres. *Revista Eduweb*, 18(3), 54-65. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.6>

Proceso educativo y emocional vivido por los adolescentes ante el fenómeno migratorio de los padres


Educational and emotional process lived by adolescents facing the migration phenomenon of parents

Medina Nelly <https://orcid.org/0000-0001-5850-6520>
medinely@gmail.com


Universidad de Carabobo Valencia, República Bolivariana de Venezuela.

Rodríguez Marisol <https://orcid.org/0000-0003-0732-8669>
macrodriguez4@gmail.com

Universidad de Carabobo Valencia, República Bolivariana de Venezuela.

Rodríguez Yolanda <https://orcid.org/0000-0002-7422-9073>
yrodriguezuc888@gmail.com

Universidad de Carabobo Valencia, República Bolivariana de Venezuela.

Virgen Kennys <https://orcid.org/0009-0008-7063-5737>
alivi81.virgen@gmail.com

Universidad de Carabobo Valencia, República Bolivariana de Venezuela.

Recibido: 13/12/23

Aceptado: 28/04/24

Resumen

La presente investigación tuvo como objetivo comprender el proceso educativo y emocional vivido por los adolescentes ante la migración de sus padres. Centrada en el paradigma cualitativo, con análisis de contenido para explicar y sistematizar la información obtenida. El estudio reveló la capacidad de resiliencia de los individuos para superar las malas condiciones de educabilidad que enfrentan en un contexto familiar de abandono, tristeza y soledad, arrojando luz sobre el tipo de acciones que los educadores podrían llevar a cabo para intervenir en situaciones desfavorables, y quizá para identificar acciones correctivas que, desde la política social y educativa, se podrían impulsar para mejorar las condiciones de los estudiantes que viven en condiciones de desequilibrio emocional producto de la migración de sus padres.

Palabras clave: Adolescentes, educación, emocional, migración, padres.

Abstract

The objective of this research was to understand the educational and emotional process experienced by adolescents when faced with the migration of their parents. Focused on the qualitative paradigm, with content analysis to explain and systematize the information obtained. The study revealed the resilience



capacity of individuals to overcome the poor educational conditions they face in a family context of abandonment, sadness and loneliness, shedding light on the type of actions that educators could carry out to intervene in unfavourable situations, and perhaps to identify corrective actions that, from social and educational policy, could be promoted to improve the conditions of students who live in conditions of emotional imbalance as a result of their parents' migration.

Keywords: Adolescents, education, emotion, migration, parents.

Introducción

La migración, está entendida como el desplazamiento de personas o grupos de su lugar de origen o residencia a otro distante geográficamente y que guarda diferencias respecto al primero, está relacionada con la expansión del ser humano y con la lucha por la supervivencia; este fenómeno ha sido practicado por multitud de pueblos y culturas a lo largo de la historia de la humanidad Mazuera-Arias et al., (2019). Sin embargo, en los últimos años ha cobrado una mayor relevancia debido a la generalización a nivel mundial, así como por las consecuencias que trae tanto para los países de origen como de acogida en múltiples niveles (sociales, legislativo, económico) entre otros.

Algunas personas se desplazan en busca de trabajo o de nuevas oportunidades económicas, para reunirse con familiares o para estudiar. Otros se van para escapar de conflictos, persecuciones, del terrorismo o de violaciones o abusos de los derechos humanos. En la actualidad, el número de personas que vive en un país distinto de su país natal es mayor que nunca. Según el Informe sobre las migraciones en el mundo 2020 de la OIM, a junio de 2019 se estimaba que el número de migrantes internacionales era de casi 272 millones en todo el mundo, 51 millones más que en 2010. Casi dos tercios eran migrantes laborales.

Al respecto, los migrantes internacionales constituían el 3,5% de la población mundial en 2019, en comparación con el 2,8% en 2000 y el 2,3% en 1980. En la actualidad, el número de personas que vive en un país distinto de su país natal es mayor que nunca ONU (2019). Según el Informe sobre las migraciones en el mundo 2020 de la OIM del Departamento de Asuntos Económicos y Sociales (DAES) de las Naciones Unidas, hasta junio de 2019 se estimaba que el número de migrantes internacionales era de casi 272 millones en todo el mundo, 51 millones más que en 2010. Casi dos tercios eran migrantes laborales. Los migrantes internacionales constituían el 3,5% de la población mundial en 2019, en comparación con el 2,8% en 2000 y el 2,3% en 1980 (OIM, 2019). Dicho esto, el aumento de los migrantes internacionales a lo largo del tiempo (tanto en cifras absolutas como proporcionalmente) ha sido evidente, y algo más rápido de lo que se había pronosticado. Globalmente, el número estimado de migrantes internacionales ha aumentado en las últimas cinco décadas.

El total estimado de 272 millones de personas que vivían en un país distinto de su país natal en 2019 es superior en 119 millones a la cifra de 1990 (153 millones) y triplica con creces la de 1970 (84 millones). Aunque la proporción de migrantes internacionales a nivel mundial también aumentó en ese período (OIM, 2019). Mientras que muchas personas escogen voluntariamente migrar, otras muchas tienen que migrar por necesidad. Según la ONU (2019) ACNUR reporta que el número de personas desplazadas por la fuerza en todo el mundo era de 79,5 millones a finales de 2019. De ellos, 26 millones eran refugiados (20,4 millones de refugiados bajo el mandato del ACNUR, 5,6 millones de refugiados palestinos bajo el mandato de UNRWA). 45,7 millones de personas fueron desplazados internos, 4,2 millones fueron solicitantes de asilo y 3,6 millones fueron venezolanos desplazados en el exterior.

La Organización Internacional para las Migraciones (OIM, 2019) define a un migrante como cualquier persona que se desplaza, o se ha desplazado, a través de una frontera internacional o dentro de un país, fuera de su lugar habitual de residencia independientemente de: 1) su situación jurídica; 2) el carácter voluntario o involuntario del desplazamiento; 3) las causas del desplazamiento; o 4) la duración de su estancia ONU (2019). En 2019 el número de migrantes internacionales (personas que residen en un país distinto al de nacimiento) alcanzó casi los 272 millones en todo el mundo – 48 por ciento de mujeres -



frente a los 258 millones de 2017. De estos, 164 millones son trabajadores migrantes. Asia acoge alrededor de 31 por ciento de la población migrante internacional, mientras que el dato para el resto de los continentes se reparte así: Europa 30 por ciento; las Américas 26 por ciento; África 10 por ciento; y Oceanía 3 por ciento ONU (2019).

Se estima que entre el 2012 y 2017 han debido emigrar al exterior 815.000 personas, por su parte la Organización de las Naciones Unidas (ONU) estimó que la migración en Venezuela en el año 2015 fue de 1.421.000 personas. En los dos últimos años, la mayoría de los migrantes venezolanos se ha dirigido hacia Colombia o usan este país como tránsito para llegar a otros destinos. Después de Colombia, Estados Unidos y España son los países donde se registran mayor cantidad de venezolanos, esto según el informe de tendencias migratorias nacionales en América del Sur, publicado por la ONU en febrero de 2018 Mazuera-Arias et al., (2019).

Profundizando sobre las causas del fenómeno, PROVEA (2017) realizó la Encuesta Nacional de Condiciones de Vida de la Población Venezolana (ENCOVI) donde se destaca que el 61,7 por ciento de los hogares se encuentran en condición de pobreza, un indicador que para 2014 se situaba en 23,6 por ciento, pasando a 49,9 por ciento en 2015 y a 51,5 por ciento en 2016, un crecimiento acelerado en apenas 4 años debido principalmente a la caída del ingreso producto de la crisis económica. Y, según ha dicho la Comisión Económica para América Latina y El Caribe de la Organización de Naciones Unidas (ONU, 2019) (CEPAL), la principal causa del aumento de la pobreza en Venezuela es la caída del ingreso producto de la pérdida de poder adquisitivo de los salarios y a la alta inflación.

En 2017 Venezuela entró en un contexto de Emergencia Humanitaria Compleja en el que más del 80 por ciento de la población, se encuentra imposibilitada de satisfacer sus necesidades en salud y alimentación. Desde octubre pasado, el país ingresó en un período de hiperinflación que, según la Asamblea Nacional, situó el índice de precios al consumidor en 2.626 por ciento para diciembre de 2017, con proyecciones que superan el 10.000 por ciento para el cierre del 2018. PROVEA (2017)

En consecuencia, el fenómeno de la migración forzada en Venezuela, en los últimos años ha alcanzado dimensiones preocupantes por la magnitud del número de venezolanos migrando a otros países, sino también por las condiciones en las cuales están emigrando, convirtiendo este fenómeno de local a continental, poniendo a una situación de vulnerabilidad a los/as venezolanos/as que emigran. La falta de un documento de identidad vigente, la escasez de recursos para emprender el viaje, el desconocimiento de las condiciones legales de otros países para migrar, las condiciones de salud y seguridad dejan expuestas a esas personas a riesgos inminentes por la falta de protección configurándose una amenaza a la vida de los venezolanos emigrantes. Mazuera-Arias et al (2019)

Los factores económicos y sociales que impulsan la migración venezolana son principalmente en la reducción de ingresos por la comercialización del petróleo, reaparición y expansión de enfermedades que habían sido erradicadas como la malaria y difteria, escasez de alimentos y medicamentos básicos, sumándose a ello la crisis política e institucional. Asimismo, la hiperinflación en Venezuela es considerada la peor del mundo inclusive peor que en los países en guerra, desde la Segunda Guerra Mundial. Las sucesivas reconversiones monetarias que ha realizado el gobierno venezolano nunca han solucionado el problema Mazuera-Arias et al., (2019). Este deterioro generalizado de la economía venezolana impacta directamente a la población asalariada, cuyos ingresos no alcanzan para adquirir ni siquiera la canasta alimentaria mensual, ni pensar en los requerimientos de salud o educación. De acuerdo con lo que se ha venido desarrollando, a lo largo de la formación educativa la familia es presentada como la unidad fundamental y que como grupo comparte una historia que está en permanente cambio y movimiento debido a que sus miembros crean modos diversos la relación entre ellos. En Venezuela existe un marco legal, que define a la familia como la primera institución de la sociedad, tal es el caso del Artículo 75 de CRBV (Constitución de la República Bolivariana de Venezuela, 1999) donde deja evidencia que el Estado creador de la norma garantizará la protección de la familia como base fundamental de la sociedad y en este sentido velará por el bienestar de ésta y de todos sus integrantes, creando mecanismos a través de



las instituciones que velen por la protección de este bienestar, tal como se cita en la LOPNA (Ley No. 5.266, 1998) en su Artículo 5° donde se establecen las Obligaciones Generales de la Familia:

La familia es responsable, de forma prioritaria, inmediata e indeclinable, de asegurar a los niños y adolescentes el ejercicio y disfrute pleno y efectivo de sus derechos y garantías. (...) El Estado debe asegurar políticas, programas y asistencia apropiada para que la familia pueda asumir adecuadamente esta responsabilidad, y para que los padres y las madres asuman, en igualdad de condiciones, sus responsabilidades y obligaciones. (p. 3)

Contradictorio a lo expuesto anteriormente, la realidad de la emigración venezolana obliga a reflexionar en las diversas y complejas experiencias de vida a las que se exponen los ciudadanos en su proceso de migración y a los que se quedan en el país, la cual necesariamente está marcada por duelos como separación de los familiares y amigos, duelo por la lengua materna, la cultura, pérdida de su tierra, pérdida del estatus social, pérdida de contacto con el grupo social y duelo por la pérdida de la seguridad física, cada uno de ellos denota diferentes tragedias para la vida del emigrante, pero sin duda alguna la separación familiar representa el mayor desarraigo y dolor, ya que es en la mayoría de las veces el motor para migrar, pero el causante de mayores sacrificios para enviar algo de dinero para el sustento de quienes se quedan o que viajan a su lado cada uno con su dolor, pero intentando proteger al otro por encima de sus propias limitaciones. Por lo que la migración representa, para muchas familias, el mecanismo para mejorar el nivel de vida, ya que trae consigo un considerable potencial de desarrollo para los migrantes y sus familias, especialmente de orden económico.

Para ilustrar lo anteriormente dicho, Gimeno Collado et al., (2014), exponen que la realidad de la migración también plantea otros retos a las familias y a sus integrantes. Los autores precisan que los más afectados por la migración de las familias suelen ser los menores y los jóvenes, ya sea porque están separados de sus progenitores permaneciendo en el lugar de origen padeciendo las consecuencias en los múltiples contextos inherentes al proceso migratorio: los familiares que permanecen en el lugar de origen, las personas que emigran solas o las familias enteras que emigran. Por lo que vale la pena profundizar estos aspectos sobre los inconvenientes que trae consigo la migración de las familias para sus miembros y los entornos donde se desenvuelven: la sociedad, la escuela u otro.

Es menester puntualizar que el proceso migratorio provoca un impacto social, cultural, político y económico, en cuya dinámica destaca la familia como protagonista, ya que sus miembros hacen esfuerzos por mantener y preservar los vínculos a través de las fronteras Mazuera-Arias et al., (2019). De esta manera, la familia juega un papel central dentro del evento migratorio, al establecer y construir lazos que superan la presencia física, lo cual supone arreglos y reconfiguraciones en el interior de la misma, lo que genera una situación estresante que incluye alteraciones psicológicas importantes entre las personas que permanecen en su lugar de origen, quienes requieren de un trabajo psicológico importante y la utilización de recursos de relación social en donde los menores son los menos favorecidos al no poseer estas herramientas de afrontamiento que da la experiencia y que pueden traer consigo serias repercusiones en todos los ámbitos de la vida e incluso en el educativo, que representa el centro de este estudio.

En el caso de los niños que se quedan solos en los lugares de origen, estos deben adoptar en muchos casos, responsabilidades y funciones que no son propias de sus edades, como el arribo a un nivel de independencia en parte económica y social, que los expone a problemáticas tales como la delincuencia, las drogas, la deserción escolar, los embarazos tempranos, etc.

Por otra parte, la desintegración familiar es otra de las consecuencias, originadas por la migración la cual repercute enormemente en el desarrollo del niño y la niña. La familia es el núcleo donde existen lazos fuertes de unión, constituye uno de los componentes centrales en las edades tempranas, la ausencia de uno o más miembros de la familia, crea una ruptura difícilmente superable para un niño o una niña, que va a repercutir necesariamente en su proceso de aprendizaje, así como en sus procesos de socialización con el entorno que le rodea. Adicionalmente los más pequeños atraviesan un período de adaptación al



hecho de que no están ya con sus papás el niño puede controlar su entorno de seguir asistiendo a clases, pero sus emociones no las pueden controlar, les embargan sentimientos que le dominan, el niño presenta actitud irritable o puede tener cambios conductuales. Coronel Berrios (2013).

Referentes teóricos

La fundamentación teórica de esta investigación se centró en la teoría psicosocial de Erikson (1987). Este autor afirmó que, los seres humanos con un desarrollo sano deben pasar a través de ocho etapas entre la infancia y la edad adulta tardía. En cada fase, la persona se enfrenta, y es de esperar que domine, nuevos retos. Todo periodo se basa en la culminación con éxito de las etapas anteriores. Si los retos no se completan con éxito en una fase, es de esperar que reaparezcan como problemas en el futuro.

Los 8 estadios psicosociales propuestos en la teoría fue la influencia de factores psicosociales, así como los socioculturales en el desarrollo del "Yo", y, por otro, propuso el desarrollo de la identidad como sucesión de etapas diferenciadas entre las que existen períodos de transición (crisis evolutivas), conceptualizando ocho crisis psicosociales o etapas del desarrollo de la identidad hacia la síntesis del "Yo".

1. **Confianza vs desconfianza:** Este estadio transcurre desde el nacimiento hasta los dieciocho meses de vida, y depende de la relación o vínculo que se haya creado con la madre. La relación con la madre determinará los futuros vínculos que se establecerán con las personas a lo largo de su vida. Es la sensación de confianza, vulnerabilidad, frustración, satisfacción, seguridad... la que puede determinar la calidad de las relaciones.
2. **Autonomía vs vergüenza y duda:** Este estadio empieza desde los 18 meses hasta los 3 años de vida del niño. Durante este estadio el niño emprende su desarrollo cognitivo y muscular, cuando comienza a controlar y ejercitar los músculos que se relacionan con las excreciones corporales. Este proceso de aprendizaje puede conducir a momentos de dudas y de vergüenza. Asimismo, los logros en esta etapa desencadenan sensación de autonomía y de sentirse como un cuerpo independiente.
3. **Iniciativa vs culpa:** Este estadio viaja desde los 3 hasta los 5 años. El niño empieza a desarrollarse muy rápido, tanto física como intelectualmente. Crece su interés por relacionarse con otros niños, poniendo a prueba sus habilidades y capacidades. Los niños sienten curiosidad y es positivo motivarles para desarrollarse creativamente.
4. **Laboriosidad vs inferioridad:** Este estadio se produce entre los 6-7 años hasta los 12 años. Los niños muestran un interés genuino por el funcionamiento de las cosas e intentan llevar a cabo muchas actividades por sí mismos, con su propio esfuerzo y poniendo en uso sus conocimientos y habilidades. Por esa razón es tan importante la estimulación positiva que pueda ofrecerle la escuela, en casa o por el grupo de iguales. Éste último comienza a adquirir una relevancia trascendental para ellos.
5. **Exploración de la identidad vs difusión de identidad:** Este estadio tiene lugar durante la adolescencia. En esta etapa, una pregunta se formula de forma insistente: ¿quién soy? Los adolescentes empiezan a mostrarse más independientes y a tomar distancia de los padres. Prefieren pasar más tiempo con sus amigos y comienzan a pensar en el futuro y a decidir qué quieren estudiar, en qué trabajar, dónde vivir. La exploración de sus propias posibilidades se produce en esta etapa. Comienzan a apuntalar su propia identidad basándose en las experiencias vividas. Esta búsqueda va a causar que en múltiples ocasiones se sientan confusos acerca de su propia identidad.
6. **Intimidad frente al aislamiento:** Este estadio comprende desde los 20 años hasta los 40, aproximadamente. La forma de relacionarse con otras personas se modifica, el individuo empieza a priorizar relaciones más íntimas que ofrezcan y requieran de un compromiso recíproco, una intimidad que genere una sensación de seguridad, de compañía, de confianza.
7. **Generatividad frente al estancamiento:** Este estadio transcurre entre los 40 hasta los 60 años. Es un lapso de la vida en el que la persona dedica su tiempo a su familia. Se prioriza la búsqueda de equilibrio entre la productividad y el estancamiento; una productividad que está vinculada al futuro, al porvenir de los suyos y de las próximas generaciones, es la búsqueda de sentirse necesitado por los demás, ser y sentirse útil.



8. Integridad del yo frente a la Desesperación: Este estadio se produce desde los 60 años hasta la muerte. Es un momento en el que el individuo deja de ser productivo, o al menos no produce tanto como era capaz anteriormente. Una etapa en la que la vida y la forma de vivir se ven alteradas totalmente, los amigos y familiares fallecen, uno tiene que afrontar los duelos que causa la vejez, tanto en el propio cuerpo como en el de los demás.

A partir de lo anteriormente expuesto puede precisarse la importancia que tiene esta teoría en el desarrollo de esta investigación. La etapa de desarrollo de la adolescencia es conocida como la crisis de identidad, donde el adolescente lucha para lograr un sentido de identidad ante los demás, de esta manera busca cumplir los diversos roles del adulto como desafíos propios.

De esta manera, se puede señalar que la identidad buscada por el individuo para ingresar a una comunidad donde el yo es un estilo individual del ser humano y quien busca introducirse en la comunidad inmediatamente. Es importante identificar la prioridad de los individuos en esta etapa. El sujeto tiene muchas preguntas para encontrarse con el mismo y con los demás. Es necesario mencionar el rol de los padres y otros modelos observados los cuales influyen en el desarrollo de su identidad personal. Cada individuo debe encontrar su identidad y debe utilizar todas sus posibilidades para lograrlo.

Teoría de los Sistemas Ecológicos. Bronfenbrenner (1979)

La teoría ecológica de Bronfenbrenner o teoría de los sistemas ecológicos fue planteada por primera vez por en su libro denominado la ecología del desarrollo humano ha servido como base para otras ciencias, como la psicología del desarrollo o la sociología. Esta explica cómo influyen los distintos grupos sociales en el desarrollo del niño y del adolescente.

Al respecto, el citado autor afirma:

Esto describe que un organismo biológico puede tener un impacto en el buen desarrollo de un ser humano. Un claro ejemplo es que debemos entender la ecología de los mares, si el mar está contaminado, no se muestran las condiciones necesarias para que un pez pueda vivir o subsistir en el hábitat a la que pertenece, lo mismo pasará con los árboles y la ecología de la tierra. De esta manera se entiende la perspectiva que tiene el autor en mencionar que la ecología del ambiente influye de alguna manera en el desarrollo del niño (p. 39).

Metodología

La investigación cualitativa puede resumirse en palabras de Martínez, (2006) como aquella que:

Trata de identificar la naturaleza profunda de las realidades, su estructura dinámica, aquella que da razón plena de su comportamiento y manifestaciones. De aquí, que lo cualitativo (que es el todo integrado) no se opone a lo cuantitativo (que es sólo un aspecto), sino que lo implica e integra, especialmente donde sea importante. (p.173)

Según el autor, este paradigma comprende el conocimiento como el resultado de una dialéctica entre el sujeto y el objeto de estudio, que se mueven en un trasfondo existencial y vivencial, en un mundo de vida, de donde evidenciará el modo propio y peculiar que tiene un grupo humano de asignar significados a las cosas y de simbolizar la realidad. De este modo, se destaca la pertinencia del enfoque cualitativo para la investigación, pues estamos ante la comprensión empática de las experiencias de vida de las personas, en relación con un determinado fenómeno o problema de estudio.

Para el desarrollo de la investigación se trabajó con el enfoque biográfico, bajo el método de relato de vida. Que, de acuerdo con Moreno, (2009) la define como el despliegue de las experiencias de una persona a lo largo del tiempo, lo cual incluye una selección consciente e inconsciente de recuerdos, de sucesos o situaciones en las cuales participó directa e indirectamente y su participación mediada por las



experiencias posteriores. Por lo tanto, el relato que hace la persona no es solo una descripción de sucesos, sino también una selección y evaluación de la realidad. El ya referido autor considera que es suficiente uno o dos relatos de vida para estudiar una sociedad. Asimismo, afirma que “las referencias de la vida cotidiana son los suficientemente numerosas como para designar, más allá de las características personales, un modo de vida”. De igual modo, de acuerdo con Morín, (1989): “se trata no de un determinismo sociológico exterior sino de una estructuración interna (...) la cultura, la sociedad están en el interior del ser humano”. (p. 31).

De modo que el conocimiento está en la cultura y la cultura está en el conocimiento.

La realización del relato de vida cumplió con los siguientes requisitos propuestos por Moreno, (2006) esquematizados en la siguiente figura:

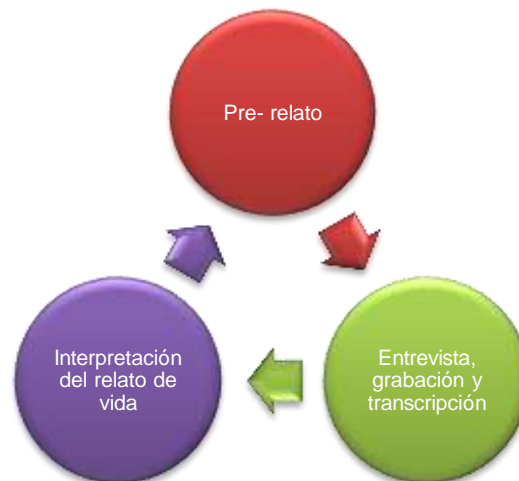


Figura 1. Fase previa al relato de vida.

Siendo la validez la fuerza mayor de las investigaciones cualitativas. En efecto, el modo de recabar los datos, de captar cada evento desde sus diferentes puntos de vista, de vivir la realidad estudiada y de analizar e interpretarla inmersos en su propia dinámica, ayuda a superar la subjetividad y da a los investigadores un rigor y una seguridad en sus conclusiones que muy pocos métodos pueden ofrecer.

En la investigación cualitativa se hace necesaria una buena confiabilidad y para Martínez (2006) “es aquella que es estable, segura, congruente, igual a sí misma en diferentes tiempos y previsible para el futuro” (p.79). Para elevar la credibilidad de una investigación según el autor antes señalado ésta “debe estar orientada hacia la concordancia interpretativa entre los diferentes observadores o jueces del mismo fenómeno” (p.80).

Técnicas de análisis de los datos o de la información

El proceso de interpretación se realizó siguiendo el modelo de categorización de Martínez (2006) el cual consistió en transcribir la entrevista, grabaciones y descripciones en los dos tercios izquierdos de las páginas, dejando el tercio derecho para la categorización. Por último, se realizaron los cuadros de análisis e interpretación, la diagramación y la teorización.

Resultados y discusión

La investigación se realizó a través del análisis de contenido, según Bardin (1996) lo conceptualiza como “el conjunto de técnicas de análisis de las comunicaciones tendentes a obtener indicadores por procedimientos sistemáticos y objetivos de descripción del contenido de los mensajes permitiendo la inferencia de conocimientos relativos a las condiciones de producción/recepción de estos mensajes.” (p. 32)

El propósito básico del análisis de la información es la identificación de determinados elementos componentes de los documentos escritos: letras, sílabas, lexemas, fonemas, sintagmas, palabras, frases, párrafos, títulos, caracteres, reactivos, secciones, temas, asuntos, medidas de espacio, medidas de tiempo, símbolos, entre otros y su clasificación bajo la forma de variables y categorías para la explicación de fenómenos sociales bajo investigación.

Resultados y su análisis

Cuadro 1.

Unidades de Análisis con sus categorías y sub-categorías sociológicas

Unidades de análisis	Categorías sociológicas	Sub-categorías
La migración, está entendida como el desplazamiento de personas o grupos de su lugar de origen o residencia a otro distante geográficamente y que guarda diferencias respecto al primero, está relacionada con la expansión del ser humano y con la lucha por la supervivencia; este fenómeno ha sido practicado por multitud de pueblos y culturas a lo largo de la historia de la humanidad Mazuera-Arias et al., (2019).	Migración	Padres migrantes
Asociado al concepto de inteligencia emocional, de acuerdo con explicaciones de Goleman (2018), permite entender que en ella se enfatiza el papel preponderante que ejercen las emociones dentro del funcionamiento psicológico de una persona cuando ésta se ve enfrentada a momentos difíciles y tareas importantes: los peligros, las pérdidas dolorosas, la persistencia hacia una meta a pesar de los fracasos, el enfrentar riesgos, los conflictos con un compañero. Si se tiene como base el desarrollo de la inteligencia emocional que según Goleman (2018), trata de cinco principios básicos; (a) el conocimiento de las emociones propias y ajenas, (b) el desarrollo de la empatía, (c) el control de los impulsos emocionales y de conducta, (d) la auto-motivación para alcanzar objetivos y (e) el desarrollo de las habilidades sociales positivas que ayuden a la relación con otras personas, la práctica de estos principios mejoran notablemente las relaciones familiares y ayuda a que la tarea educativa, familiar y comunitaria encuentre el equilibrio que tanto se desea.	Proceso emocional	Resiliencia
La educación es por excelencia un proceso de cambios; donde se imparten aprendizajes y enseñanzas, conocimientos, buscando la socialización metódica de la nueva generación haciendo que los jóvenes crezcan en un determinado estilo de vida. La educación permite que se incremente la capacidad productiva de las sociedades a través de la provisión de habilidades técnicas y sociales, así como mediante diversos tipos de motivaciones, igualmente la educación ayuda al ascenso social del individuo.	Proceso educativo	Motivación
Este estadio tiene lugar durante la adolescencia. En esta etapa, una pregunta se formula de forma insistente: ¿quién soy? Los adolescentes empiezan a mostrarse más independientes y a tomar distancia de los padres. Prefieren pasar más tiempo con sus amigos y comienzan a pensar en el futuro y a decidir qué quieren estudiar, en qué trabajar, dónde vivir. La exploración de sus propias posibilidades se produce en esta etapa. Comienzan a apuntalar su propia identidad basándose en las experiencias vividas. Esta búsqueda va a causar que en múltiples ocasiones se sientan confusos acerca de su propia identidad.	Exploración de la Identidad vs Difusión de Identidad	Soledad



Cuadro 2.

Unidades de Análisis: La migración; Categoría: Migración; Sub-categoría: Padres migrantes

Inf.	Unidad de codificación	Unidad contextual	Unidad Analítica
R	<p>Mis padres salieron del país en busca de mejoras para sus hijos. Mi papá está en Chile. Es Licenciado en Informática y mi mamá está en Perú con mi hermana de 6 años. También es graduada, pero ella es Licenciada en enfermería. Ambos son profesionales</p> <p>Como ya te dije y desde que salieron del país tienen empleos fijos en esos países. Dios me los ha cuidado muchote.</p> <p>Mi pa se fue el 08/01/2019 y mi ma el 22/01/2019. Se llevan 15 días de diferencia en los viajes puecsss. A mí me dejaron porque no tenían para mi pasaje y los gastos que el viaje implicaba.</p> <p>Mi pa se fue el 08/01/2019 y mi ma el 22/01/2019. Se llevan 15 días de diferencia en los viajes puecsss. A mí me dejaron porque no tenían para mi pasaje y los gastos que el viaje implicaba. Yo solo me rio porque debo confesarte que no ha sido tan fácil ni pa mi ni para mi familia regada Solo que ellos no lo reconocen como yo pues. Cuando les digo que deseo vernos juntos y no por una simple video llamada y se me agua el guarapo hasta me pongo a llorar ellos cambian el tema y terminan haciendo video llamada cada uno por su cuenta para brindarme el apoyo que ellos suponen que necesito, pero yo los quiero a ellos junto a mí.</p> <p>Me hacen muuuuuucha falta y sé que debo continuar, aunque a veces siento que seguiremos así y me tocara sobrevivir acá solo.</p>	<p>Mejor calidad de vida familiar</p> <p>Nivel académico universitario</p>	<p>La situación humanitaria actual de Venezuela se caracteriza por una amplia migración de su población a diferentes países del continente de manera transitoria o como destino a largo plazo o permanente. Entre las necesidades sentidas de los migrantes se encuentran la falta trabajo digno con la posibilidad de obtener ingresos económicos suficientes para satisfacer necesidades relacionadas como alimentación, vivienda, educación, estado de salud como preexistencia de la migración o como consecuencia de la misma, presentación personal</p> <p>La migración se puede entender como un movimiento de personas, sea cual fuere su tamaño, composición o causas, hacia el territorio de otro estado o dentro del mismo, implicando un conjunto de factores causales, de desarrollo y consecuencias, tanto para la sociedad de origen como para la de destino La migración hacia otro país, implica una reorganización de las actividades en la vida de las personas involucradas en tal proceso, asimismo un replanteamiento en las necesidades, los satisfactores y las capacidades que se requieren para la realización de una vida de calidad.</p>

Conclusiones

La migración es el desplazamiento de personas desde su lugar de residencia habitual hacia otra, en algunos casos por un corto tiempo o de manera permanente La ausencia de uno de los padres ha traído como consecuencia la separación física y emocional de la familia, a partir de lo cual los hijos viven situaciones frustrantes al sentirse abandonados afectivamente por sus representantes. Por otra parte, resulta complejo buscar suerte en el extranjero, la migración de venezolanos representa consecuencias negativas, pero uno de sus resultados preocupantes son los niños ya que se incrementa el número de padres que deciden emprender camino a otro país. Esos niños y jóvenes quedan bajo la tutela de un familiar, abuelos, amigos, vecinos e incluso en estado de soledad y desamparo.

Este estudio aporta de forma certera a la investigación sobre el impacto psicológico, educativo y social que causa la migración de los padres venezolanos a los hijos que quedan solos o con familiares una vez que estos se marchan del país. El estudio ayuda a comprender con una idea más completa en relación con las problemáticas biopsicosociales vinculadas con la emigración laboral de los padres y como vislumbrar el proceso vivido por los adolescentes ante el fenómeno migratorio de sus progenitores.

La investigación se centró en el relato de vida de un adolescente, quien vive actualmente en la ciudad de Valencia, estado Carabobo, Venezuela y vive en carne propia el proceso de separación de sus padres; madre y padre, por razones migratorias. Ambos progenitores decidieron emprender una nueva vida cada uno por su lado en distintos países, el padre emigró hacia una región ubicada en Perú y la madre hacia



otra ciudad distinta ubicada en Chile, son países fronterizos, pero con realidades y contextos diferentes. Este proceso migratorio, además de dejar solo al adolescente en el país, los padres sufrieron un rompimiento como pareja, como matrimonio y que los aleja uno del otro.

La migración produce en los adolescentes, la más absoluta orfandad de padres vivos, duelo, soledad, tristezas, llanto, además abusos; físico, emocional y educativo por parte de los cuidadores. El crecimiento y la formación de un adolescente separado físicamente-emocional-psicológica y socialmente, de su familia primaria, sin el apoyo de sus padres deja profundas cicatrices en su vida, ya que al desaparecer esta estructura, en este caso por la migración de los padres los niños, así como los adolescentes pierden cobijo, conexión emocional, un lugar de calidez, lo que podría conducirlos a la desesperanza, la desmotivación, al aislamiento, la soledad y por ende la alegría de vivir plenamente.

La migración desvirtúa el funcionamiento total del sistema familiar al desestructurarse este núcleo los individuos que componen esta unidad dejan de trabajar juntos e interactuar por intereses comunes, además ya los límites propios se desvanecen y surge la despreocupación, el desinterés y compromiso por los demás miembros de la familia.

La separación de la madre por emigración está considerada más riesgosa en el desarrollo de los menores que la separación del padre. Cuando el emigrante es el padre los hijos tienen el privilegio de seguir viviendo en sus casas y ser cuidados por su madre; cuando emigra la madre muy pocas veces, el padre se queda al cuidado directo de sus hijos. Pero si emigran los dos el hijo adolescente que queda en casa se siente desorientado, desafortunado, herido en lo más profundo de su ser. Las migraciones forman las familias más transnacionales y un gran número de menores se desarrollan en sus países de nacimiento al cuidado de sustitutos sin relaciones habituales con su madre o su padre salvo los contactos sean telefónicos o por el uso de internet. Se evidencia entonces que los niños y los adolescentes no eligen la migración de sus padres y a menudo no entienden esta situación, en algunos casos los hijos saben acerca de las decisiones de los padres al emigrar, siendo los últimos en enterarse de esta realidad, en conocer los hechos en la mayoría de los casos experimentan miedo tristeza y depresión ante la inminente realidad de la ausencia de la figura protectora y afectiva de enorme relevancia en su proceso de desarrollo y crecimiento.

Otro aspecto derivado del estudio, fue lo relacionado con la parte emocional ya que en las complejas relaciones intrafamiliares, las emociones juegan un importante papel, siendo definidas por Bisquerra Alzina (2003) como “un estado complejo del organismo caracterizado por una excitación o perturbación que predispone a una respuesta organizada” (p.12), lo cual implica el aprendizaje del manejo de respuestas emocionales con el fin de poder construir relaciones interpersonales asertivas y armónicas. La familia juega un importante papel en el fomento de esta habilidad a lo largo de años de infancia y adolescencia, contribuyendo de forma sustancial a la adquisición de habilidades sociales necesarias para un buen desenvolvimiento social de los hijos, siendo un espacio de mayor relevancia para este aprendizaje debido a que dentro de las interrelaciones personales en las que se desenvuelve la familia se viven a diario diversas emociones que expresan posiciones frente a las circunstancias específicas, lo cual requiere de un aprendizaje en cuanto a su manejo con el fin de no afectar el funcionamiento familiar.

Los adolescentes con padres emigrantes enfrentan fuerzas externas sobre las que carecen prácticamente de control. Los imperativos de la cultura, el género, la mundialización y la pobreza han empujado a millones de adolescentes de forma prematura a asumir funciones y responsabilidades propias de adultos. A medida que desaparecen las redes sociales tradicionales, la estructura de la familia se remodela y a veces se viene abajo, y la capacidad de los sistemas de apoyo de la familia y la comunidad disminuye. Al ver cómo su mundo pierde seguridad, coherencia y estructuras, los adolescentes enfrentan, con demasiada frecuencia, elecciones difíciles, casi siempre sin nadie que los ayude. Dentro de este proceso emocional surge la capacidad de la resiliencia por parte de muchas personas, pieza clave para la sociología de la educación, puesto que podríamos aprender cómo han hecho los individuos para superar las malas condiciones de educabilidad que enfrentan en un contexto familiar de abandono, tristeza y soledad.



El estudio de los resilientes podría arrojar luz sobre el tipo de acciones que los educadores podrían llevar a cabo para intervenir en situaciones desfavorables, y quizá para identificar acciones correctivas que, desde la política social y educativa, se podrían impulsar para mejorar el contexto de los estudiantes que viven en circunstancias de desequilibrio emocional producto de la migración de sus padres.

Por tanto, el papel de la educación es facilitar el desarrollo personal y familiar mediante acciones sistemáticas y programadas, los padres y los educadores deben saber, que el desarrollo es consecuencia de la educación, ya que el nacimiento de un niño implica no solo proporcionarle cuidados físicos de protección, sino convertirlo en miembro de la especie humana, integrarlo en el grupo cultural donde ha nacido y cuyas costumbres, tradiciones y normas ha de asimilar. Finalmente, los riesgos que asumen los adolescentes no son un reflejo de sus propias actitudes y deseos, sino la consecuencia de presiones que ejercen sobre ellos algunos adultos, por sus formas de comportamiento abusivas y explotadoras, por los ejemplos que establecen y por las políticas que crean. En el momento en que los niños y jóvenes se están transformando en hombres y mujeres, quizás la más influyente de todas las presiones sea la migración forzada de sus padres.

Referencias Bibliográficas

- Bardin, L. (1996). *Análisis de contenido*. Editorial Akal.
- Bisquerra Alzina, R. (2003). Educación emocional y competencias básicas para la vida. *Revista de Investigación Educativa*, 21(1), 7-43. Recuperado a partir de <https://revistas.um.es/rie/article/view/99071>
- Blynova, O., Popovych, I., Semenova, N., Kashyryna, Y., Ursulenko, O., & Kononenko, O. (2020). Personality Factors of Choosing Adaptation Strategies in a Different Cultural Environment by Labor Migrants from Ukraine. *Amazonia Investiga*, 9(32), 45-54. <https://doi.org/10.34069/AI/2020.32.08.5>
- Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge: Harvard University Press.
- Constitución de la República Bolivariana de Venezuela (1999). *Gaceta Oficial Extraordinaria N° 36.860 de fecha 30 de diciembre de 1.999*. Recuperado de https://www.oas.org/dil/esp/constitucion_venezuela.pdf
- Coronel Berrios, F. H. (2013). Efectos de la migración en el proceso de aprendizaje-enseñanza y su tratamiento desde la escuela. *Revista integra educativa*, 6(1), 57-77. http://www.scielo.org.bo/scielo.php?script=sci_arttext&pid=S1997-40432013000100004&lng=es&tlng=es
- Erikson, E. (1987). *Teoría Psicosocial*. Buenos Aires. Paidós Recuperado de <https://psicologiaymente.com/desarrollo/teoria-del-desarrollo-psicosocial-erikson>
- Gimeno Collado, A., Lafuente Benaches, M. J., & González Sala, F. (2014). Análisis del proceso migratorio de las familias colombianas en España. *Escritos de Psicología*, 7(1), 31-42. Recuperado de: http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S1989-38092014000100004&lng=es&nrm=iso
- Goleman, D. (2018). *Inteligencia Emocional*. Editorial Kairos. Recuperado de: http://www.cutonala.udg.mx/sites/default/files/adjuntos/inteligencia_emocional_daniel_goleman.pdf
- Ley No. 5.266. Ley Orgánica para la Protección del Niño y del Adolescente (LOPNA). *Gaceta Oficial Extraordinaria*, 2 de octubre del año 1998. Recuperado de <http://www.ucv.ve/uploads/media/lopna.pdf>
- Martínez, M. (2006). *Comportamiento Humano: Nuevos métodos de Investigación*. 2da edición. México. Trillas.
- Mazuera-Arias, R., Albornoz-Arias, N., Morffe Peraza, M.A., Ramírez-Martínez, C., & Carreño-Paredes, M.T. (2019). *Informe de movilidad humana venezolana II. Realidades y perspectivas de quienes emigran (8 de abril al 5 de mayo de 2019)*. San Cristóbal, Venezuela: SJR (Venezuela) - Centro Gumilla - UCAT - IIES-UCAB. Recuperado de <https://bonga.unisimon.edu.co/items/7bc0deb4-7577-42d5-bede-b0d4f88510b1>



- Moreno, A. (2006). *Heterotopia: Tejiendo el Pensamiento desde el Otro Lugar*. Caracas, Venezuela: Centro de Investigaciones Populares.
- _____ (2009). *El Aro y la Trama: Episteme, Modernidad y Pueblo*. Edit. Convivium Press, Florida USA. Recuperado de https://bibliofep.fundacionempresaspolarg.org/media/1280379/vsxx_l1_4_nosotros_3_t.pdf
- Morín, E. (1989). *La Nueva Ciencia. Su Desafío, Lógica y Método*. México, Editorial Trillas.
- Organización Internacional para las Migraciones (OIM). (2019). *Informe sobre las migraciones en el mundo*. Recuperado de https://publications.iom.int/system/files/pdf/wmr_2020_es.pdf
- Organización de Naciones Unidas (ONU) (2019). *Asuntos que nos importan: Migración. Paz, dignidad e igualdad en un planeta sano*. Recuperado de <https://www.un.org/es/global-issues/migration>
- PROVEA (2017). *Encuesta Nacional de Condiciones de Vida de la Población Venezolana (ENCOVI) 2017: 87% de los hogares venezolanos están en condición de pobreza*. Recuperado de <https://provea.org/actualidad/encovi-2017-87-de-los-hogares-venezolanos-estan-en-condicion-de-pobreza/>






DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.7>

Cómo citar:

González Torres, A., Ramírez Castañeda, I.A., & Brauer Aguilar, M.S. (2024). Competencias digitales en estudiantes de ingeniería: Análisis del uso y percepción de herramientas tecnológicas. *Revista Eduweb*, 18(3), 66-87. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.7>

Competencias digitales en estudiantes de ingeniería: Análisis del uso y percepción de herramientas tecnológicas

Digital competencies in engineering students: Analysis of the use and perception of technological tools

Arturo González Torres <https://orcid.org/0000-0002-3337-7600>
cann.azteca13@gmail.comTecnológico Nacional de México/ Instituto Tecnológico de Milpa Alta, Profesor - Investigador,
Ciudad de México, México.**Iscander Armando Ramírez Castañeda** <https://orcid.org/0000-0003-2613-2207>
ixcander@gmail.comTecnológico Nacional de México/ Instituto Tecnológico de La Laguna, Profesor,
Coahuila, México.**Martha Susana Brauer Aguilar** <https://orcid.org/0000-0002-6400-4452>
susanabrauer.sma@gmail.comInstituto Tecnológico y de Estudios Superiores de Monterrey, Profesora - Investigadora,
Ciudad de México, México.

Recibido: 01/08/24

Aceptado: 26/09/24

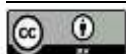
Resumen

El artículo tiene como objetivo explorar el uso y percepción de herramientas digitales en estudiantes de ingeniería de primer semestre. La metodología empleada fue cuantitativa, con un enfoque exploratorio y descriptivo. Se utilizó un instrumento de medición validado con un alto coeficiente de fiabilidad (Alfa de Cronbach de 0.963) para evaluar el desarrollo de las competencias clave en el ámbito profesional, se considerarán cuatro dimensiones: manejo estratégico de la información, comunicación eficaz, dominio de herramientas tecnológicas y capacidad organizativa. Los hallazgos más relevantes incluyen: Un nivel moderado de competencia digital entre los estudiantes, con un promedio general de 62.74% en el uso de herramientas digitales. Los resultados de esta investigación revelan que, a pesar de una aparente familiaridad con las herramientas tecnológicas, los futuros ingenieros presentan oportunidades de desarrollo en sus competencias digitales, especialmente en el ámbito académico.

Palabras clave: Competencia digital, educación superior, herramientas digitales, ingeniería, tecnología educativa.

Abstract

The article aims to explore the use and perception of digital tools in first semester engineering students.



The methodology used was quantitative, with an exploratory and descriptive approach. A validated measurement instrument with a high reliability coefficient (Cronbach's alpha of 0.963) was used to assess the development of key competencies in the professional field, four dimensions will be considered: strategic management of information, effective communication, mastery of technological tools and organizational skills. The most relevant findings include: A moderate level of digital competence among students, with an overall average of 62.74% in the use of digital tools. The results of this research reveal that, despite an apparent familiarity with technological tools, future engineers present opportunities for development in their digital competencies, especially in the academic sphere.

Keywords: Digital competence, higher education, digital tools, engineering, educational technology.

Introducción

Derivado de todos los cambios tecnológicos y que de alguna manera han sido la mejor opción para la difusión de la enseñanza y aprendizaje, en este sentido de acuerdo con (Díaz-Guecha & Márquez-Delgado, 2019), el rápido avance de la tecnología en un mundo globalizado ha provocado una mayor necesidad de actualización continua de conocimientos. Frente a este panorama cambiante la sociedad ha creado diversas herramientas digitales que transforman la forma en que se enseña y aprenden cosas nuevas; facilitando el acceso a información y mejorando notablemente las experiencias educativas.

En este contexto Díaz-Guecha & Márquez-Delgado (2019) destaca que esta revolución tecnológica implica no solo un cambio en las herramientas utilizadas sino también en nuestra manera de pensar y colaborar juntos en equipo. Es casi como si estuviéramos erigiendo una nueva torre de Babel para conectarnos por medio del conocimiento. En este nuevo mundo educativo no podemos permanecer estáticos en el suelo mirando hacia arriba; más bien debemos convertirnos en el pasajero del ascensor que nos lleve hasta la cima adaptándonos al vertiginoso ritmo de la innovación y preparando tanto estudiantes como profesores para ser los constructores del porvenir.

En ese mismo sentido, los avances tecnológicos y científicos, especialmente en el ámbito de la informática, han transformado rápidamente los procesos educativos, proporcionando un mayor acceso a la información y mejorando la calidad de la enseñanza y el aprendizaje. Si bien, con la globalización la educación debe adoptar las tecnologías emergentes para fomentar e incrementar el conocimiento aunado a un trabajo colaborativo, en específico, en el ámbito de la educación se debe mantener a la vanguardia con el uso de las Tecnologías de la Información y la Comunicación (TIC), no solo dominando las herramientas, sino también aplicándolas efectivamente para mejorar los procesos educativos.

El objetivo de este estudio es proporcionar una comprensión detallada del uso y la percepción de las herramientas digitales en los estudiantes de ingeniería de una universidad pública, con el fin de proporcionar recomendaciones para mejorar la integración y el uso efectivo de tecnologías digitales en la educación de ingeniería.

La irrupción de las tecnologías digitales en el ámbito académico ha redefinido los paradigmas de la enseñanza superior. En este contexto, analizar el modo en que los estudiantes de ingeniería de una institución pública interactúan con estas herramientas y perciben su impacto resulta fundamental para comprender los procesos de transformación que atraviesa la educación superior en la era digital. En carreras como ingeniería, que requieren una sólida formación teórica y práctica, las herramientas digitales no solo facilitan el aprendizaje y la comprensión de conceptos complejos, sino que también proporcionan plataformas para simulaciones, modelado y otras aplicaciones prácticas esenciales.

Además, la pandemia de COVID-19 ha acelerado la adopción de herramientas digitales en la educación, obligando a las instituciones a adaptarse rápidamente a nuevas formas de enseñanza. Sobre este punto, la investigación de "Las clases virtuales en México durante la pandemia. Ventajas y desventajas", realizada por Martínez-Aguilar, & Pérez -Múzquiz (2022), obtuvieron resultados como "si las clases virtuales facilitan



o dificultan el proceso de aprendizaje-enseñanza”, teniendo como resultado relevante que el 50.6% de los encuestados respondió que en su mayoría lo dificultan.

Por ello la importancia de realizar esta investigación referente a las competencias digitales en estudiantes de ingeniería, es crucial por varias razones, en el caso de las carreras de ingeniería están cada vez más vinculadas al uso de tecnologías avanzadas y poder comprender las competencias digitales de los estudiantes permite identificar áreas de mejora que los preparen para un entorno laboral altamente digitalizado; puede optimizar el proceso de aprendizaje a través del análisis del uso y la percepción de las herramientas digitales puede coadyuvar en el diseño de estrategias educativas más efectivas y ajustarlas a las exigencias de los alumnos; así también identificar la adaptación de los cambios educativos, los cuales se está transformando digitalmente, lo anterior es clave para asegurar que las instituciones educativas evolucionen al mismo ritmo que la tecnología, lo cual garantiza la relevancia de sus programas.

Por lo anterior, este estudio examina el uso y percepción de las herramientas digitales en estudiantes de primer semestre de ingeniería, el cual muestra resultados que abarcan las cuatro dimensiones plasmadas en el instrumento de medición que son: información, comunicación, tecnología y organización dejando ver variables como competencia digital, habilidad en organización y manejo de la tecnología, destacando la necesidad de integrar mejor la alfabetización digital en los programas educativos de ingeniería para preparar a los estudiantes para un entorno profesional más digitalizado.

El presente artículo se divide en cuatro apartados, iniciando por los *Referentes teóricos*, donde se describen tanto los antecedentes históricos del uso de las herramientas digitales y el proceso de enseñanza - aprendizaje durante la pandemia de Covid-19; en una segunda instancia se adentra a la *Metodología* desde el enfoque cuantitativo, en el cual se basa la investigación permitiendo la recolección y análisis de datos con la finalidad de comprender el fenómeno de este caso de estudio; en el apartado tres de los *Resultados y discusión*, donde se informa de manera simple y objetiva sobre los hallazgos obtenidos de los datos del instrumento de medición; por último las *Conclusiones*, que observa que los estudiantes tienen preferencias o mayor familiaridad con ciertas herramientas digitales, lo cual podría guiar a los educadores en la selección de herramientas más efectivas para el aprendizaje.

Referentes teóricos o revisión de literatura

En los últimos años, la incorporación de herramientas digitales en la educación ha transformado significativamente la forma en que los estudiantes acceden y asimilan el conocimiento. Esta transformación ha sido acelerada por la pandemia de COVID-19, que obligó a las instituciones educativas a adoptar rápidamente métodos de enseñanza a distancia. Diversos estudios realizados en diferentes regiones del mundo han evaluado tanto la efectividad de estas herramientas como los desafíos que enfrentan en su implementación. Por lo que a continuación se destaca un breve resumen de la adaptación que se ha presentado en diferentes regiones del mundo.

El trabajo de investigación realizado por Sunkel (2010) revela una cruda realidad: en América Latina, el amanecer del siglo XXI no trajo consigo una revolución tecnológica que emparejara el terreno de juego. Al contrario, la brecha digital que ya existía se agrandó como un abismo, dejando a muchos aún más rezagados en la era digital. Era claro que se requerían políticas públicas más sólidas para mejorar la educación de manera equitativa y acorde a las demandas actuales del siglo XXI; entre ellas destacaban iniciativas como mejorar la conectividad en los programas educativos y la capacitación docente junto a una profunda transformación institucional. Sin embargo, en esta última década, dada la situación de la pandemia de COVID-19, lo que en un principio se planteaba como una necesidad, se convirtió en un tema imperativo que demandaba atención inmediata en diferentes regiones del mundo, generándose un cambio en todas sus dimensiones y ámbitos, donde los nuevos dispositivos se han convertido en un bien de primera necesidad (Castellano Gil, 2020).



Por lo que, el consumo de las nuevas tecnologías, ha sido centro de atención por diversos investigadores en otros espacios Latinoamericanos con enfoques y tratamientos diferentes, por ejemplo en un estudio cualitativo tomado por Linne en Castellano Gil (2020), sobre el uso de las TIC, realizado sobre una población estudiantil de las facultades de Filosofía y Letras y Ciencias Sociales de la Universidad de Buenos Aires, arrojó un comportamiento paradójico, donde el incremento de accesibilidad a internet beneficia la disponibilidad de información que conlleva a la superficialidad y rapidez en las tareas académicas, que lleva a su autor a conceptualizar ese fenómeno de “fastfood académico”. En esa misma línea se orienta otro trabajo, tomado de Salado y Ramírez en Castellano Gil (2020) donde sugieren que la mera presencia de tecnologías digitales en el entorno académico no garantiza una mejora en los procesos de enseñanza-aprendizaje.

Para García Martín & García Martín (2021), la llegada del COVID-19 a nuestras vidas en 2020 hizo que las escuelas y colegios en España tuvieran que adaptarse de manera drástica. De repente las aulas bulliciosas se transformaron en simples pantallas y tanto profesores como alumnos se vieron inmersos en una nueva realidad. La clásica pizarra física fue reemplazada por plataformas digitales y este repentino cambio representó un desafío sin precedentes. Esta situación revolucionó por completo la forma en que concebimos la enseñanza y el proceso de aprendizaje. García Martín, & García Martín señalan que en la actualidad y especialmente durante la última década, ha imperado un constante interés por que los sistemas educativos respondan de manera satisfactoria a las demandas sociales. Cada alumno tiene sus propias características únicas y por tanto es fundamental personalizar la enseñanza según sus necesidades individuales y velocidades de aprendizaje ¡Todos salimos beneficiados cuando el proceso educativo es atractivo y se adapta a cada persona!.

De acuerdo a Comisión Económica para América Latina y el Caribe (CEPAL-UNESCO, 2020), durante el año 2020, el cierre de los establecimientos escolares obligó a los países de la región (América Latina y El Caribe), a implementar de forma inesperada y como respuesta urgente ante la crisis, diversas modalidades de educación a distancia. A pesar de que la educación a distancia dista de ser una novedad educativa, y muchos países contaban con plataformas digitales, programas de dotación de tecnología a estudiantes y docentes, o incluso de prácticas educativas implementadas a través de la radio y la televisión, la mayoría de los países se encontraba en condiciones subóptimas para enfrentar esta transición tan inesperada. (Huepe et al., 2020)

En otra perspectiva, para Feijóo et al., (2021), la pandemia fue un desafío sin precedentes para el sistema educativo en todo el mundo y China no fue la excepción; las escuelas tuvieron que adaptarse rápidamente a las clases en línea lo que resultó ser un éxito desde el punto de vista institucional al salvar el año escolar gracias a la tecnología; no obstante si nos adentramos en la experiencia cotidiana de las aulas virtuales la realidad es distinta. Los maestros se comparaban como navegantes en un barco recién estrenado: lidiando por dominar las herramientas digitales y extrañando la cercanía de sus estudiantes. Mientras tanto los alumnos, a menudo presionados por unos padres que consideraban el futuro de sus hijos en riesgo, sentían en ocasiones una soledad más profunda que nunca. A pesar de los obstáculos, encontraron en el aprendizaje en línea un valioso aliado que probablemente nos seguirá acompañando en el futuro, aunque de forma más complementaria al modelo educativo tradicional.

Como se puede identificar en los diferentes continentes, el uso de las tecnologías dentro de la educación, a través de las diferentes investigaciones, están en pro del conocimiento, sin embargo, no hay que perder en cuenta que, puede acarrear problemas técnicos como factores que limiten la aplicación y uso de las mismas, cuestiones como el acceso limitado a dispositivos con conexión a internet, falta de capacitación en el uso de las plataformas para los docentes y estudiantes.

Lo anterior demuestra la importancia de reconocer que, más allá del acceso rápido a información que nos brindan las tecnologías actuales, la educación a distancia abre un mundo de posibilidades. Personas con diversas circunstancias, ya sea por motivos laborales, familiares o discapacidades, ahora pueden acceder a estudios de calidad sin las limitaciones de un aula física. Las plataformas educativas en línea han



democratizado el conocimiento, permitiendo que cada individuo explore su potencial sin importar su ubicación.

En México, el uso de herramientas digitales en la educación ha tenido un impacto positivo en el rendimiento académico, por ejemplo el Instituto Politécnico Nacional (IPN) siempre a la vanguardia, fue uno de los primeros en México en vislumbrar el potencial de la educación en línea, ofreciendo bachillerato y algunas licenciaturas. Asimismo, ha dado un paso significativo al dotar a sus aulas con tecnología de punta, como televisores, proyectores, pantallas interactivas y acceso a internet. Sin embargo, esta implementación se ha centrado mayormente en facilitar el acceso a la información y la comunicación, dejando aún un margen de exploración para aprovechar al máximo el potencial de estas herramientas en la creación de entornos de aprendizaje verdaderamente digitales, por lo que, la crisis sanitaria supuso un reto sin precedentes para el Instituto Politécnico Nacional (IPN), pero al mismo tiempo representó una oportunidad única para transformar la forma de educar. Tanto profesores como estudiantes colaboraron estrecha mente para llevar las clases a un entorno digital. El IPN ofreció una amplia variedad de herramientas y recursos educativos que iban desde materiales interactivos hasta tutoriales personalizados para aprender a utilizar plataformas como Classroom y Moodle. De esta manera la comunidad del IPNy demostró su capacidad de adaptación y resistencia frente a la adversidad convirtiendo los obstáculos en oportunidades para innovar en el ámbito educativo. (Jiménez Galán et al., 2021).

Sin lugar a dudas, en paralelo las plataformas de teleformación engloban un amplio rango de aplicaciones informáticas instaladas en un servidor cuya función es facilitar al profesorado la creación, administración, gestión y distribución de recursos por medio de la Internet y diversas plataformas que pueden ser de tipo comercial, de software libre y de desarrollo propio o bien existen las comerciales que han evolucionado ante el creciente mercado de actividades formativas en Internet y son una buena opción, pero se requiere de una licencia para usarlas tomado de Sánchez, en Gómez Collado (2016). Las plataformas de software libre son gratuitas y una de las más conocidas es el Modular Objet Oriented Distance Learning Environment (MOODLE). Las de desarrollo propio responden más a factores educativos y pedagógicos, y surgen en instituciones o en grupos de investigación. La Universidad Autónoma del Estado de México (UAEMéx) cuenta con el Sistema de Educación Continua y a Distancia (Seduca), que es una plataforma propia utilizada por profesores y estudiantes de diversas áreas del conocimiento (Gómez Collado et al., 2016).

En este contexto, la Universidad Nacional Autónoma de México (2021), en la conferencia virtual “Las tecnologías de información y comunicación y su implicación en el aprendizaje y la investigación”, Héctor Benítez Pérez, Director General de la DGTIC, anunció una revolución en la forma de evaluar a los estudiantes. Ahora se cuentan con salones de clase virtuales diseñados especialmente para exámenes profesionales. Esto significa que cualquier egresado, sin importar dónde se encuentre, puede presentar su examen de grado desde la comodidad de su hogar, siempre y cuando tenga una conexión a internet.

Referentes teóricos

Derivado del cierre generalizado en las instituciones educativas de todos los niveles académicos derivado de la pandemia por el virus Covid-19, y según datos recabados por la Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura (Unesco), fue en el mes de abril 2020 que más del 90 % de los estudiantes a nivel mundial se vieron afectados por la suspensión e inactividad de todas las actividades educativas en modalidad presencial. Esta drástica medida generó la necesidad de que todos los involucrados, incluyendo directivos, docentes y estudiantes, buscaran y se adaptaran a nuevas alternativas para los procesos tradicionales de enseñanza, lo que obligó a transitar hacia una modalidad virtual apoyada en herramientas y plataformas de educación a distancia, transición que impactó en todos los sistemas educativos a nivel mundial (IESALC-UNESCO, 2020).

Tomando en cuenta los datos proporcionados por la Organización de las Naciones Unidas (2020), las suspensiones en las áreas educativas sorprendieron al 94% de los estudiantes a nivel mundial, afectando



de manera más directa a países en vías de desarrollo; denotando un impacto intenso la incapacidad de algunos grupos para acceder a las tecnologías en esta contingencia sanitaria, y que finalmente resultó en una pérdida irremediable de oportunidades educativas en poblaciones con carencias significativas abonándole el abandono de las aulas y demás actividades escolares.

La interrupción de clases presenciales en los países hispanos llevó a la búsqueda y aceptación de alternativas de enseñanza a distancia. Así, se emplearon diversas opciones tecnológicas con el fin único de dar continuidad a los programas académicos. Para lograr esto, fue esencial el apoyo y la movilización del personal educativo, así como priorizar la atención a la salud y el bienestar integral de los estudiantes (CEPAL-UNESCO, 2020). De acuerdo con los hallazgos de Brown & Salmi (2020), se revela que, a pesar de la voluntad de las instituciones educativas por continuar con el proceso de enseñanza - aprendizaje en línea, fueron pocas las que lograron cumplir con los requisitos necesarios para la transición de manera ágil. Este desafío pegó demasiado en los estudiantes pertenecientes a los grupos más vulnerables, demostrando la disparidad en el acceso a la educación en línea por lo que los hallazgos de Lloyd (2020) resaltan la necesidad de estar preparados para adaptarnos a estos cambios en un mundo que experimenta una constante modernización, especialmente en el ámbito tecnológico, donde cada día surgen novedades digitales o actualizaciones.

El proceso de enseñanza - aprendizaje en modalidad en línea durante la pandemia de Covid-19 se volvió esencial para llevar a buen término los planes y programas de estudio. Según Molina-Montalvo et al. (2023), la modalidad virtual ha estado históricamente vinculada a instituciones de nivel superior y al sector empresarial, sobre todo en las universidades de Inglaterra, Estados Unidos y Nueva Zelanda que fueron pioneras en la incorporación de cursos a distancia, y que después abarcaron áreas de Europa y Latinoamérica. En respuesta a la transformación de la educación virtual en una necesidad imperativa, estas instituciones se han visto obligadas a diseñar nuevos protocolos educativos con la finalidad de preservar la integridad del aprendizaje de los alumnos (Zuluaga-Gómez & Valencia-Ortiz, 2021).

La modalidad académica en línea durante la crisis sanitaria se desarrolló a través de los medios digitales, quienes tuvieron un papel trascendental en la educación en línea. Este cambio, por supuesto, exigió el esfuerzo de los profesores para adaptar programas, metodologías e instrumentos de evaluación, lo que también demandó un proceso constante de reflexión sobre los aspectos académicos y los recursos tecnológicos disponibles en cada contexto (García Aretio, 2021).

Así, las nuevas tecnologías de la información surgieron como elementos prioritarios para dar continuidad a la enseñanza a distancia, lo que fomentó el desarrollo y uso de diversas herramientas y plataformas digitales diseñadas exclusivamente para el contexto educativo. En este tenor, las plataformas educativas más demandadas fueron Google Classroom, Microsoft Teams, E-dixgal y Edmodo (Otero et al., 2020), las cuales demostraron ser fundamentales para el entorno educativo al permitir y facilitar la interacción entre docentes y estudiantes, la distribución de materiales educativos y la realización de actividades académicas de manera virtual.

Los estudios de Elbashir & Hamza (2022) nos muestran de manera clara cómo la tecnología ha transformado nuestras vidas. Ante este nuevo panorama, resulta evidente que los sistemas educativos deben evolucionar y adoptar metodologías pedagógicas innovadoras que permitan a los estudiantes desarrollar las competencias necesarias para enfrentar los desafíos del siglo XXI. Tal como lo evidencian Fucili et al. (2020), este nuevo escenario ha propiciado la proliferación de plataformas de e-learning, entornos virtuales diseñados para facilitar la adquisición de conocimientos y habilidades de manera flexible y personalizada.

De acuerdo con Mitchell & Herrera (2020), las herramientas virtuales aplicadas en la educación permiten ampliar las oportunidades de los estudiantes y facilitan el acceso directo a los conocimientos de forma casi inmediata. La crisis sanitaria global desencadenó en cada uno de nosotros una necesidad innata de cuestionar lo establecido y explorar nuevas fronteras del pensamiento, propiciando un florecimiento sin precedentes de la creatividad individual.



De igual manera, Auteri et al. (2020) señala que en el contexto educativo las medidas sanitarias significaron un cambio de paradigma dando lugar a grandes cambios en todos los niveles educativos. El nuevo ritmo y manera de llevar el proceso de enseñanza - aprendizaje, generó la disminución de tiempos e incentivo la producción de nuevos materiales audiovisuales para cumplir con los objetivos.

En este sentido, el uso de las TIC y las herramientas virtuales en la educación benefician la generación de conocimientos acerca de estos entornos, así como de las diferentes aplicaciones para mejorar el proceso de enseñanza-aprendizaje, causando un impacto importante en el aprendizaje y la calidad de la educación (Milá Pascual et al., 2022). Por lo tanto, es importante conocer cuáles son las aplicaciones, plataformas virtuales y herramientas digitales usadas en el ámbito educativo, ya que a través de ellas los estudiantes logran una mayor y mejor autonomía e independencia, marcando ellos mismos su ritmo de aprendizaje (Vélez-Sabando et al., 2022).

Como lo señalan Tzenguzha-Abarca et al. (2021) en su examinación, las herramientas digitales emergentes constituyen un paradigma innovador en el ámbito educativo, facilitando la construcción de aprendizajes significativos y potenciando el desarrollo de competencias clave en los estudiantes. La implementación de herramientas virtuales en el ámbito educativo exige una consideración minuciosa de las particularidades tanto del estudiantado como del profesorado. Es imperativo que estas herramientas se adapten de manera flexible a las diversas necesidades y estilos de aprendizaje, proporcionando una interfaz intuitiva y una experiencia de usuario amigable que fomente la participación activa.

En la era digital, las herramientas tecnológicas han emergido como catalizadores inigualables para fomentar la creatividad y la innovación en los estudiantes. Al trascender los límites de los métodos pedagógicos tradicionales, estas herramientas equipan a las nuevas generaciones con competencias esenciales para el siglo XXI. Además de optimizar la gestión de recursos y ampliar el alcance educativo, la integración de tecnologías digitales en los procesos de enseñanza-aprendizaje representa una inversión en el futuro (Kumar & Vasimalairaja, 2019).

El panorama digital contemporáneo se caracteriza por una rica diversidad de herramientas, cada una con su propia identidad y capacidad evolutiva, en consecuencia, la variable en estudio se operacionaliza a través de las dimensiones expuestas en la Tabla 1.

Tabla 1.

Dimensiones e indicadores del uso de las herramientas digitales.

Herramienta	Indicador
Almacenamiento: constituyen entornos virtuales que facilitan el almacenamiento y acceso remoto a grandes volúmenes de datos.	Google Drive, One Drive, Mega y Dropbox
Colaborativas: suscitan la formación de redes colaborativas entre estudiantes.	Moodle y Google Classroom
Comunicación: son herramientas fundamentales en la construcción de experiencias de aprendizaje significativas y personalizadas.	Zoom, Google Meet y Skype
Creación de contenido: posibilitan la generación y distribución abierta de recursos académicos, ampliando el acceso al conocimiento.	Kahoot, ExcelLearning y Powtoon
Evaluación: constituyen instrumentos indispensables para cuantificar y cualificar los logros académicos adquiridos por los estudiantes en un determinado campo de estudio.	Socrative

Fuente: Kumar & Vasimalairaja, (2019); Gonzales Arteaga, & Oseda Gago, (2021)

Incluso, cuando se habla de una evaluación completa de herramientas digitales, suelen considerarse también los aspectos de la compatibilidad con diferentes dispositivos, la disponibilidad de recursos y materiales relevantes, la interactividad, la retroalimentación proporcionada, la seguridad de la información y la accesibilidad para estudiantes con discapacidades. Además, es relevante tener en cuenta las opiniones y vivencias de los propios estudiantes universitarios al utilizar estas herramientas, pudiendo ser



a través de encuestas, entrevistas o grupos de discusión, para comprender mejor el contexto de sus necesidades y expectativas, de modo que, en caso necesario, se puedan mejorar y adaptar las herramientas digitales a sus nuevos requerimientos específicos.

Cabe mencionar que las herramientas digitales en línea han mejorado la forma en que se adquieren conocimientos, ya que se cuenta con acceso a cursos, tutoriales y recursos educativos de calidad, logrando que estas herramientas ofrezcan flexibilidad y conveniencia para aprender a un ritmo personalizado, no importando el lugar y momento; debido a esto, se entiende que el aprendizaje no había sido tan accesible como ahora lo es y que está al alcance de los estudiantes universitarios que quieran aprovechar sus ventajas.

Lo anterior se expone debido a que, antes de la pandemia, en el ámbito académico y en cualquiera de sus variantes, no había sugerencias que hicieran una verdadera diferencia en nuestro estudio. Hernández Suárez et al. (2021) aseveran que la motivación del alumno y los recursos técnicos son factores clave en este proceso. La educación superior debe ser un faro que guíe a las nuevas generaciones hacia un futuro más justo y sostenible; dicho de otro modo, la educación debe abrir las puertas a un mundo digital lleno de posibilidades, donde todos puedan explorar y crecer. Hoy más que nunca, los profesores necesitan evolucionar junto con el mundo que los rodea. Imaginemos un aula donde la tecnología no sea solo una herramienta, sino una compañera de viaje que despierta la curiosidad y el amor por aprender.

Según Guillén-Gámez et al. (2021) los profesores de hoy necesitan un kit de herramientas digital que les permita navegar por las aguas de la educación moderna. Imaginemos un aula donde los docentes, equipados con las últimas tecnologías, puedan encender la chispa de la curiosidad en cada estudiante, ofreciéndoles un acceso instantáneo a un mundo de conocimiento y fomentando un diálogo abierto y colaborativo. Si bien, las herramientas de colaboración son soluciones ideales para realizar actividades académicas en línea, como cuando quedó demostrado durante el confinamiento debido a la crisis sanitaria Covid-19, (Mosquera Gende, 2022), estas herramientas no solo resuelven el problema de la distancia, sino que también fortalecen las habilidades como el aprendizaje colaborativo, independencia y autoaprendizaje. Además, se trata de que estas herramientas digitales permitan un aprendizaje más interactivo y personalizado, mejorando la eficiencia y la calidad de los resultados académicos universitarios. Es por ello, que la UNESCO ha emitido un comunicado hacia la comunidad internacional, en el que proporciona una lista de herramientas de colaboración digital y plataformas tecnológicas que favorezcan la disminución del impacto o efecto que conllevó la pandemia para el sector educativo (Ramírez Montoya et al., 2022). Es por ello que empresas como Microsoft y Google han ofrecido, aunque con algunas limitaciones, acceso gratuito a aplicaciones de colaboración en diversos países. Por ejemplo, Google nos ha facilitado la vida digital con herramientas como Jamboard, que transforma cualquier pantalla en una pizarra colaborativa.

En México se usa una gran diversidad de herramientas digitales, las más utilizadas incluyen redes sociales como Facebook, Instagram y Twitter, plataformas de mensajería como WhatsApp, aplicaciones de streaming como Netflix y Spotify, así como plataformas de comercio electrónico como MercadoLibre y Amazon. Estas herramientas permiten a las y los universitarios estar en contacto con un público más amplio y generar mayores oportunidades de interacción académica y laboral en un entorno digital.

Además, en México, las herramientas digitales han transformado la forma en que las instituciones de educación superior se comunican e interactúan. Desde redes sociales como Facebook e Instagram, hasta plataformas de comercio electrónico como Mercado Libre y todos aquellos portales y herramientas digitales académicas donde se trabaja e interactúa, permiten concentrar a una mayor cantidad de partes interesadas y generar mayores oportunidades de usabilidad y utilidad para fines académicos, administrativos y de investigación.

En tan solo unos años, los medios tradicionales han cambiado y se han adaptado a las nuevas tecnologías que han ido abarcando cada vez más la atención debido a la importancia que han generado, ejemplo de



esto es la aparición de las grandes plataformas de medios sociales que, sin lugar a duda, han transformado los canales de comunicación.

Cuando aparecieron las primeras comunidades en línea, fue aumentando la participación y la interacción, y en breve nacieron más medios sociales, lo que provocó el comienzo de este gran despertar de los canales de comunicación, hasta lo que conocemos actualmente como redes sociales, quienes han generado un alto impacto en el estilo de vida de las y los universitarios. Las redes sociales han dejado huella en la vida académica, sobre todo en la forma de comunicar, en el compartir los conocimientos y las opiniones dentro y fuera del aula, en la forma en que se contactan con otros estudiantes de diversos lugares, logrando la experiencia de vivir en vivo algo inesperado.

El comparativo de las primeras redes sociales es que no eran tan completas ni sofisticadas como lo son las actuales; por ejemplo, con el surgimiento de la primera red social, llamada SixDegrees, no tuvo el mismo éxito como las plataformas sociales actuales de Facebook, Instagram, Snapchat, Twitter, Pinterest, YouTube, entre otras. En la actualidad, cada persona en el mundo, incluyendo a los niños, a quienes se les conoce como la generación Z o nativos digitales, tienen contacto frecuente con dispositivos tecnológicos, desde computadoras personales, tabletas, smartphones o teléfonos inteligentes, y con muchas otras herramientas digitales que se vuelven una necesidad de uso en los diferentes ámbitos de la sociedad (Xie, 2020).

Ya que la evaluación de herramientas digitales en jóvenes universitarios se refiere al análisis y estudio de las diferentes herramientas tecnológicas digitales que están disponibles y que son utilizadas por ellos para mejorar su experiencia académica y rendimiento, dicha evaluación implica el tener en cuenta aspectos como la usabilidad, funcionalidad, eficacia, beneficios y motivaciones que ofrecen estas herramientas digitales a los jóvenes universitarios.

La educación ya no se reduce a la transmisión de conocimientos; es un arte que se transformó junto con la tecnología modernizada. Para ser maestros motivadores, debemos ser mentes creativas curiosas que emplean las herramientas digitales como instrumentos para diseñar aulas dinámicas y experiencias educativas memorables, como señalan Ramos Hernández & Maya Rosell (2022) que, la motivación es como un motor que impulsa a maestros y alumnos por igual. Cuando ambos comparten esta pasión por aprender y crecer juntos en conocimiento; se crea un ambiente educativo dinámico y enriquecedor donde las barreras desaparecen y el avance es constante.

Actualmente, se observa una baja participación del profesorado que no ha logrado adaptarse a las herramientas digitales debido al miedo a implementar algo nuevo en sus clases, (Palomino & Camilo, 2021). La tecnología no es solo una herramienta, es una puerta hacia un mundo de experiencias interactivas. La incorporación de herramientas digitales en el entorno educativo cataliza una profunda transformación pedagógica, desplazando los modelos pasivos de aprendizaje hacia paradigmas constructivistas que empoderan al estudiante como agente activo de su propio conocimiento. La iniciativa de Levano-Francia et al. (2019) presenta un enfoque prometedor para potenciar la integración de herramientas digitales en las prácticas docentes. Sin embargo, las tecnologías requieren que el profesorado esté capacitado (Díaz-Arce & Loyola-Illesca, 2021), y tenga la formación en el uso de las herramientas digitales que le permita eliminar viejos métodos de enseñanza y dar lugar a nuevos conceptos, métodos, prácticas y manejos de datos (Santana-Mero et al., 2021). La tecnología es un camino muy beneficioso, sin embargo, este tipo de desarrollos sirven tanto para extender como para mejorar el aprendizaje (Vera & García-Martínez, 2022).

Fernández-Sánchez et al. (2019) aluden a que las herramientas digitales, las TIC y las redes sociales pueden ser herramientas importantes para la educación superior, ya que tienen recursos adicionales para motivar a los estudiantes e incrementar su participación. Estos recursos son como un kit de herramientas para maestros, diseñados para hacer que el aprendizaje sea más divertido y efectivo. En este sentido, la tecnología se presenta como un complemento valioso para la educación, al permitir una interacción más



dinámica entre los estudiantes y el docente al ofrecer nuevos y mejores panoramas en que la información se presenta y donde se toma en consideración el fundamento teórico del conectivismo, del socio constructivismo y de la motivación en el alumnado (Rodríguez Barboza et al., 2022). Utilizadas de forma inteligente, las herramientas digitales pueden encender la chispa de la curiosidad en nuestros estudiantes, motivándolos a participar activamente y a aprender de manera más profunda.

de Soto García (2018) plantea que las herramientas digitales transforman la enseñanza en un diálogo dinámico. En este nuevo escenario, los estudiantes son los protagonistas activos de su propio aprendizaje, construyendo conocimientos de manera colaborativa y motivada. De simples receptores a creadores activos, los estudiantes construyen su propio conocimiento digitalmente, motivándose y aprendiendo de manera más profunda. Además, considerando que al estar ante una cultura universitaria en la que los estudiantes deben estar en permanente contacto con diversas fuentes de información, saber manejar el conocimiento y seleccionar lo que es apropiado para un contexto determinado, son ellos mismos quienes están interactuando y sacando el mayor provecho a esas herramientas digitales.

Como señalan Monroy et al. (2018) el docente contemporáneo no solo selecciona herramientas digitales, sino que las moldea y adapta para co-crear experiencias de aprendizaje únicas. Su rol trasciende la mera transmisión de conocimientos; se convierte en un guía que acompaña a cada estudiante en su propio trayecto. Además, la motivación puede ser intrínseca o extrínseca, y es importante que los profesores puedan identificar cuál es la fuente de motivación de cada estudiante para adaptar sus métodos de enseñanza y mantenerlos involucrados en el proceso educativo (González Benito et al., 2021).

Metodología

Método

El enfoque cuantitativo es un método de investigación que se basa en la recolección y análisis de datos numéricos con el fin de comprender fenómenos y establecer patrones y relaciones entre variables. Este método se utiliza ampliamente en diversas disciplinas como las ciencias sociales, naturales y aplicadas (Creswell & Creswell, 2018). SAGE Publications.

Caracterizado por su objetividad y precisión, el enfoque cuantitativo busca minimizar la subjetividad a través de métodos estructurados y herramientas estadísticas. Los datos recolectados son de naturaleza numérica, lo que facilita su análisis mediante diversas técnicas estadísticas (Hernández et al., 2020). Los estudios cuantitativos se destacan por ser altamente estructurados y controlados, con hipótesis y variables claramente definidas desde el inicio. Esto permite generalizar los resultados obtenidos a poblaciones más amplias, siempre y cuando se utilice una muestra representativa y adecuada (Johnson & Christensen, 2020). SAGE Publications.

Entre las ventajas clave del enfoque cuantitativo se encuentra su precisión y exactitud, derivadas del uso de métodos estadísticos robustos. La objetividad también es una ventaja significativa, dado que este enfoque minimiza el sesgo subjetivo tanto en la recolección como en el análisis de datos (Creswell & Creswell, 2018). Además, facilita la generalización de resultados y permite controlar rigurosamente las variables para establecer relaciones causales claras y directas entre ellas (Hernández et al., 2020).

En otro punto, el nivel exploratorio de investigación se utiliza cuando el tema es novedoso o poco estudiado. Se enfoca en obtener información inicial sobre un fenómeno específico para identificar variables y formular preguntas o hipótesis que guíen estudios más profundos. Su objetivo principal es familiarizarse con el fenómeno y establecer las bases para investigaciones futuras. Las investigaciones exploratorias son flexibles y abiertas, permitiendo al investigador ajustar el enfoque conforme avanza el estudio. Emplean métodos cualitativos como entrevistas, grupos focales y revisión de literatura para obtener una comprensión preliminar del fenómeno (Hernández et al., 2020).

El nivel descriptivo se centra en detallar las características de un fenómeno o población específica sin



establecer relaciones causales entre variables. Este tipo de investigación radica en ofrecer una descripción objetiva y precisa de un suceso o acontecimiento, construyendo una imagen fiel y veraz de la realidad en estudio. Por lo que las investigaciones descriptivas utilizan tanto métodos cualitativos como cuantitativos. En el enfoque cuantitativo, se recopilan datos numéricos que se analizan estadísticamente para describir la distribución de variables en una población. En el enfoque cualitativo, se recogen datos narrativos que describen las características y experiencias de los sujetos, ya que el objetivo principal del nivel descriptivo es proporcionar una descripción detallada y exacta del objeto de estudio, lo cual puede ser fundamental para desarrollar teorías y para estudios posteriores de carácter correlacional o experimental (Hernández et al., 2020).

En este caso un ejemplo de aplicación del estudio exploratorio se podría ver reflejado en investigar el uso inicial de nuevas tecnologías educativas en aulas universitarias para identificar las variables clave y desarrollar hipótesis sobre su impacto. Posteriormente, un estudio descriptivo podría detallar cómo estas tecnologías son implementadas y utilizadas por los estudiantes y docentes, proporcionando datos precisos sobre sus características, ventajas y desafíos.

Por lo anterior, de acuerdo con Hernández et al. (2020), es importante abordar el diseño experimental, el cual es una metodología rigurosa utilizada para establecer relaciones de causalidad entre variables mediante la manipulación y control de variables en un entorno controlado, dentro de sus características en el diseño experimental, el investigador manipula una o más variables independientes para observar su efecto en la variable dependiente. Esta manipulación permite determinar si hay una relación causal entre las variables. Por lo que es importante, tener claro los siguientes conceptos:

Tabla 2.
Concepto clave.

Control de Variables Extrañas	Se deben controlar todas las variables extrañas o confusas que puedan afectar los resultados del experimento. Esto se logra mediante técnicas como la aleatorización y el uso de grupos de control.
Grupos de Control y Experimental	Generalmente, los estudios experimentales incluyen al menos dos grupos: el grupo experimental, que recibe el tratamiento o intervención, y el grupo de control, que no lo recibe. Esto permite comparar los efectos de la variable independiente.
Aleatorización	La asignación aleatoria de los sujetos a los grupos de control y experimental es crucial para asegurar que cualquier diferencia observada entre los grupos se deba al tratamiento y no a otras variables.
<i>Tipos de Diseños Experimentales</i>	
Diseño Experimental Puro	Involucra la manipulación de la variable independiente y el control de las variables extrañas mediante la aleatorización.
<i>Incluye diseños como</i>	
Diseño de Post-prueba con Grupo Control	Los sujetos son asignados aleatoriamente a los grupos experimental y de control, y se mide la variable dependiente después de la intervención.
Diseño de Pre-prueba y Post-prueba con Grupo Control	Se mide la variable dependiente antes y después de la intervención en ambos grupos para evaluar el cambio producido por el tratamiento.
Diseño Cuasi-experimental	No utiliza la aleatorización, lo que puede introducir sesgos, pero sigue manipulando la variable independiente.
<i>Ejemplos incluyen</i>	
Diseño de Serie Temporal Interrumpida	Se realizan múltiples observaciones antes y después de la intervención para detectar tendencias y cambios.

Fuente: Elaboración propia con información de Hernández, Fernández, & Baptista, (2020).

Participantes

Participaron en estudio un conjunto de 44 estudiantes matriculados en primer semestre. La selección de



la población de estudio se fundamentó en criterios específicos relacionados con la naturaleza del tema de investigación y la disponibilidad de participantes. En este caso, se optó por estudiantes matriculados en el primer semestre de su carrera profesional.

Instrumento

Según Hernández et al. (2006), un instrumento de medición es un recurso o herramienta que se utiliza para recolectar datos de manera sistemática y válida, con el fin de responder preguntas de investigación o evaluar variables específicas en un estudio. Estos instrumentos pueden tomar diversas formas, como cuestionarios, escalas de actitudes, guías de observación, pruebas psicométricas, entre otros. La clave de un buen instrumento de medición radica en su capacidad para obtener información confiable y válida sobre las variables de interés, asegurando que los datos recolectados sean consistentes y puedan ser interpretados de manera adecuada para los propósitos del estudio.

En ese sentido, se consideró un instrumento de medición que caracteriza las habilidades digitales de interés con propósito educativo, el cual considera cuatro dimensiones: acceso a información, manejo de comunicación, aspectos de organización y manejo de tecnología portátil, estas corresponden a categorías mayormente utilizadas por los estudiantes (Organista-Sandoval et al., 2016; Kukulska & Traxler, 2007). En estrecha colaboración con un panel de expertos, se diseñó un conjunto inicial de 31 ítems de medición, fundamentados en un exhaustivo análisis del comportamiento observable. La escala de medición se recupera a partir de la especificación propuesta por Carrera Farran et al. (2011) (Organista-Sandoval et al., 2016).

El cálculo de univocidad realizado en el instrumento antes señalado se basó en la suma de evaluación de los expertos para cada reactivo dividido entre el valor máximo de la escala por el número de expertos (Organista-Sandoval et al., 2016). La fiabilidad de un instrumento de medición se define como el grado en el que las puntuaciones obtenidas reflejan la verdadera puntuación del individuo en el constructo latente. Este concepto se vincula estrechamente con la precisión y la consistencia de la medición. Para ello, se calculó el coeficiente Alpha de Cronbach tomado de Nunnally y Bernstein en Organista-Sandoval et al. (2016). Es conveniente señalar que la fiabilidad no es una característica del instrumento, sino de las puntuaciones obtenidas en una muestra determinada (Celina Oviedo & Campo Arias, 2005), (Organista-Sandoval et al., 2016).

Uno de los supuestos de los modelos de ecuaciones estructurales de acuerdo Organista-Sandoval et al. (2016), es que las variables observadas mantengan, de forma conjunta, una distribución normal multivariante para optimizar los estimadores tanto individuales como de ajuste global. Para estimar esa condición, el instrumento utilizó la prueba de normalidad multivariante del paquete AMOS, que considera las razones críticas de asimetría y curtosis (González et al., 2006) para analizar si las variables mantenían un patrón de distribución mesocúrtico y sin sesgo. De las treinta variables evaluadas en el cuestionario, tan solo un 40% (n=12) demostraron ajustarse a una distribución normal univariante. La estructura conceptual de las habilidades digitales se sustenta en cuatro factores o variables latentes especificadas como las dimensiones de: manejo de información, manejo de comunicación, manejo de tecnología y aspectos de organización (Organista-Sandoval et al., 2016).

Las variables observadas o medibles como lo describe Organista-Sandoval et al. (2016), están conformadas por los valores que se obtienen de las respuestas a los reactivos del cuestionario. En esta etapa, se va a someter el modelo a un examen riguroso. Usando una técnica estadística avanzada, los Modelos de Ecuaciones Estructurales, se compara lo que el modelo predice con lo que realmente se observó en las respuestas de los estudiantes. Uno de los indicadores que se utilizan, el Chi-cuadrado, dirá si el modelo está "viendo" la realidad de la misma manera que el investigador. Entre más pequeño sea este valor, mejor será el ajuste. Según lo señalado por Byrne en Organista-Sandoval et al. (2016), el índice de bondad de ajuste (GFI) ofrece una estimación de la proporción de la variabilidad observada en los datos que es capturada por el modelo propuesto. Por su parte, el índice ajustado (AGFI) refina esta medida al incorporar una penalización por la complejidad del modelo. En ambos casos, valores cercanos



a la unidad sugieren un ajuste adecuado del modelo a los datos.

En consecuencia, el instrumento utilizado de esta investigación se aplicó en una muestra de 44 alumnos, de los cuales se distribuyen como se detalla a continuación: de la Ingeniería en Gestión Empresarial de la asignatura de Desarrollo Humano 12, para la materia de Fundamentos de Investigación de la Ingeniería en Bioquímica 25, finalmente de la Ingeniería en Inteligencia Artificial de la misma asignatura 7 alumnos.

Resultados y discusión

El estudio revela un panorama alentador sobre la adopción de herramientas digitales entre los estudiantes de primer ingreso en carreras de Ingeniería. Con una muestra de 44 estudiantes, se observa un uso moderadamente alto de tecnologías digitales en sus prácticas académicas. El análisis abarca cuatro dimensiones clave: información, comunicación, tecnología y organización, cada una ofreciendo perspectivas únicas sobre cómo los estudiantes interactúan con el entorno digital en su vida académica. Aunque se detectaron áreas de oportunidad, en general, los resultados pintan un cuadro positivo de una generación de ingenieros en formación que está abrazando la transformación digital desde el inicio de su carrera universitaria.

Tabla 3.

Distribución de estudiantes.

Materia	Total Alumnos
Desarrollo Humano IGE	12 (9h 3 m)
Fundamentos de Investigación IBQ	25 (12h, 13 m)
Fundamentos de Investigación IIA	7 (3h, 4m)
TOTAL	44

Fuente: Elaboración propia.

La tabla preliminar muestra la distribución de alumnos por materia. La muestra total es de 44 estudiantes, con la mayoría (25) en Fundamentos de Investigación de Ingeniería Bioquímica, seguido por 12 en Desarrollo Humano de Ingeniería en Gestión Empresarial, y 7 en Fundamentos de Investigación de Ingeniería en Alimentos. Esto indica una representación desigual entre las diferentes materias y programas.

La figura 1 se observan dos segmentos: Masculino (en azul) representa el 54.55% de los estudiantes y Femenino (en rojo) representa el 45.45% de los estudiantes.

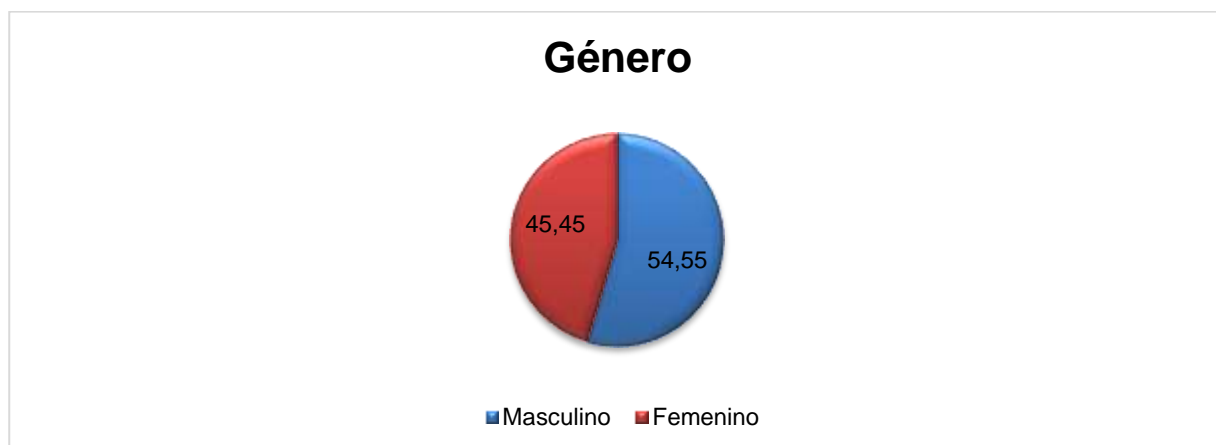


Figura 1. Género.

Fuente: Elaboración propia.

La figura antecesora alude a una distribución relativamente equilibrada entre géneros, con una ligera mayoría de estudiantes masculinos en comparación con las estudiantes femeninas.

En la figura 2 se presentan tres gráficos circulares que resumen la completitud de los datos en términos de variables, casos y valores:

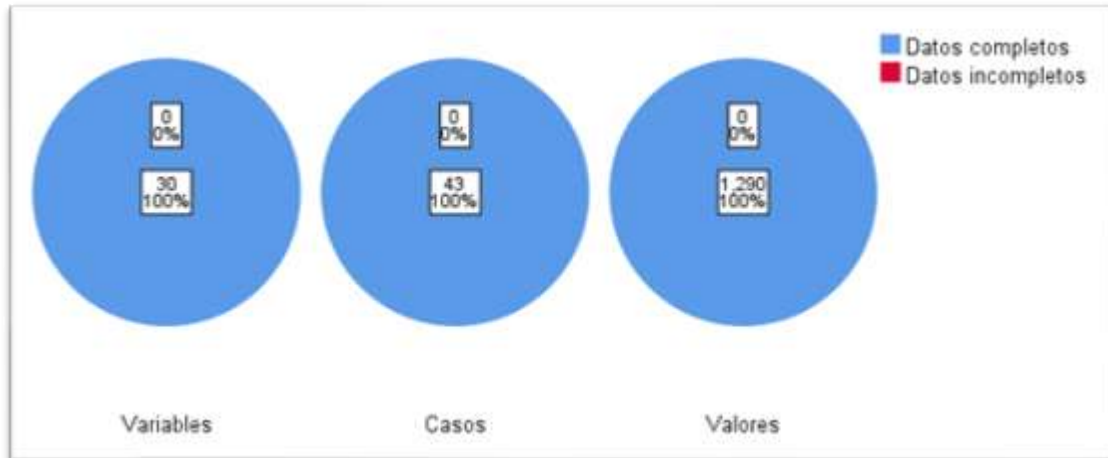


Figura 2. Resumen global de información.

Fuente: Elaboración propia con base en el programa SPSS, versión 25.

La figura preliminar ilustra lo siguiente:

- Variables. Datos completos: 30 (100%), lo cual indica que todas las variables del estudio tienen datos completos, sin valores perdidos.
- Casos. Datos completos: 43 (100%), lo cual muestra que todos los casos (estudiantes) tienen datos completos, sin pérdida de cifras.
- Valores. Datos completos: 1,290 (100%), esto significa que el total de valores en el conjunto de datos está completo, sin ningún valor perdido.

Con el objetivo de determinar la consistencia interna de las escalas utilizadas, se calculó el coeficiente Alfa de Cronbach. Los resultados de este análisis se presentan en la Tabla 4.

Tabla 4.

Estadísticas de fiabilidad.

Alfa de Cronbach	No. de elementos
0.963	30

Fuente. Elaboración propia con base en el programa SPSS, versión 25.

La Tabla anterior presenta un coeficiente de 0.963, calculado a partir de 30 ítems. Este valor indica una excelente consistencia interna, confirmando la fiabilidad del instrumento, información retomada de los autores Rodríguez-Rodríguez, J., & Reguant-Álvarez (2020).

La figura 3 evidencia la integración de herramientas digitales en las prácticas informativas entre los alumnos de nuevo ingreso.



Figura 3. Resultados de variable información.

Fuente. Elaboración propia.

La figura antecesora apuntó que las barras 5 y 7 tienen los valores más altos (67.44), lo que indica una mayor percepción o uso en comparación con los otros ítems. En cambio, la barra 3 tiene el valor más bajo (54.26), lo que sugiere una menor percepción o uso. El promedio obtenido de esta dimensión es de 61.79%, lo que proporciona una visión general del nivel medio de percepción o uso de todos los ítems evaluados.

La figura 4 presenta un análisis preliminar sobre la adopción de herramientas digitales como medio de comunicación entre los alumnos de nuevo ingreso.

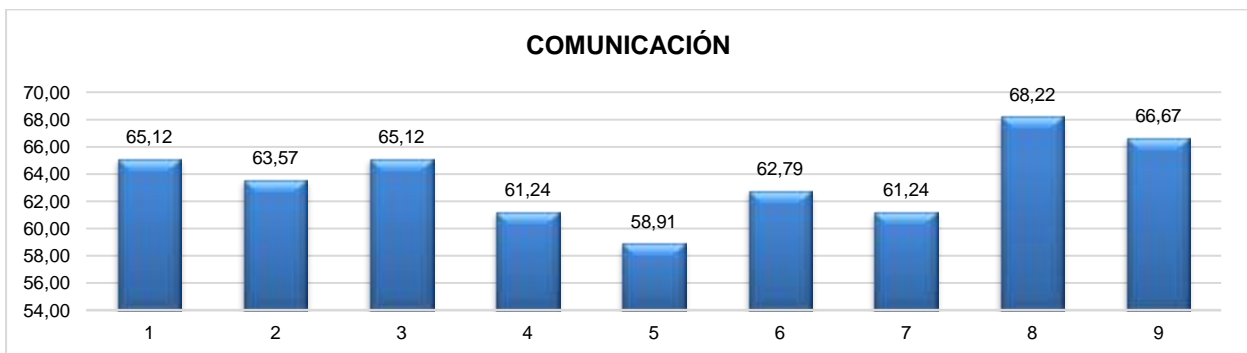


Figura 4. Resultados de variable comunicación.

Fuente. Elaboración propia.

La figura anterior mostró las barras 8 y 9 tienen los valores más altos (66%), lo que indica una mayor percepción o uso en comparación con los otros ítems. En cambio, la barra 5 tiene el valor más bajo (58.91%), lo que sugiere una menor percepción o uso. El promedio obtenido de esta dimensión es de 63.28%, lo cual indica un nivel de percepción o uso moderadamente alto en general.

La figura 5 expone el grado de apropiación de recursos digitales entre los alumnos de nuevo ingreso, destacando su relevancia en el desarrollo de competencias tecnológicas iniciales.

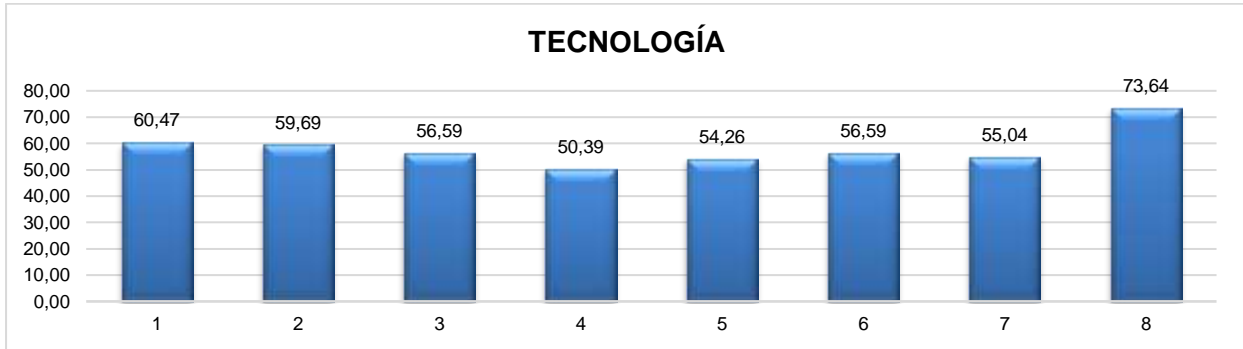


Figura 5. Resultados de variable tecnología.

Fuente. Elaboración propia.

La figura antecesora aludió que las barras 8 tiene el valor más alto (73.64%), lo que indica una mayor percepción o uso en comparación con los otros ítems. En cambio, la barra 4 tiene el valor más bajo (50.39%), lo que sugiere una menor percepción o uso. El promedio obtenido de esta dimensión es de 58.33%, lo cual señala un punto medio en la percepción o uso de los elementos evaluados.

La figura 6 presenta un análisis preliminar sobre la adopción de herramientas digitales de organización entre los alumnos de nuevo ingreso.



Figura 6. Resultados de variable organización.

Fuente. Elaboración propia.

La figura anterior representó que las barras 2, 3 y 4 tiene el valor más alto (70%), lo que indica una mayor percepción o uso en comparación con los otros ítems. En cambio, la barra 6 tiene el valor más bajo (61.24%), lo que sugiere una menor percepción o uso. El promedio obtenido de esta dimensión es de 67.55%, lo cual indica un nivel de percepción o uso general moderadamente alto.

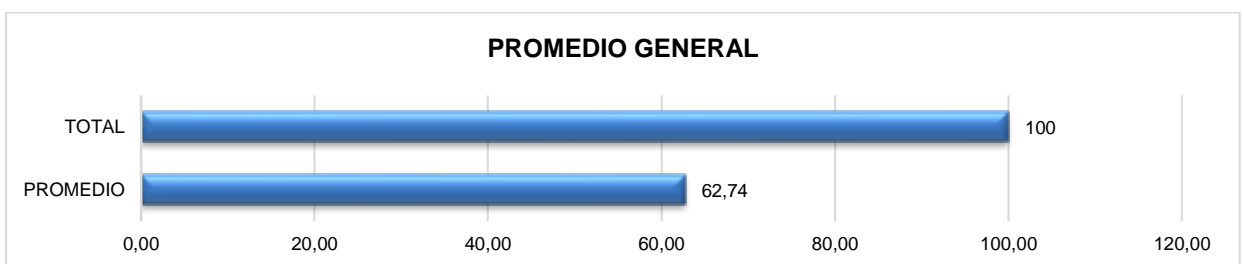


Figura 7. Promedio General.

Fuente. Elaboración propia.

La figura antecesora simboliza el promedio general de los datos mostrados en las figuras anteriores, ofreciendo una visión global del uso de herramientas digitales por parte de los estudiantes de ingeniería de primer semestre, el cual fue de 62.74%, lo cual señala que, en promedio, más de la mitad de los estudiantes utilizan habitualmente herramientas digitales como parte de sus estudios.

Discusiones

El estudio inicia con la preocupación de que nuestros estudiantes de ingeniería pudieran no estar completamente preparados para un mundo profesional cada vez más digitalizado. Los resultados confirman parcialmente estas preocupaciones. Si bien se evidencia un uso moderado de herramientas digitales, el promedio general de 62.74% sugiere que hay un margen significativo de mejora. Esto es particularmente crucial en ingeniería, donde la innovación tecnológica es constante y la adaptabilidad digital es una competencia clave.

Estos hallazgos tienen implicaciones profundas para cómo abordamos la enseñanza de la ingeniería. Primero, necesitamos capitalizar las fortalezas que hemos identificado. La alta competencia en organización digital podría ser un punto de partida para introducir herramientas más avanzadas de gestión de proyectos y colaboración, habilidades cruciales en la práctica de la ingeniería moderna. En cuanto a la brecha en habilidades tecnológicas, esto desafía a integrar más experiencias prácticas con tecnologías emergentes en nuestros cursos introductorios. Se puede considerar la implementación de laboratorios virtuales, proyectos basados en simulaciones, o incluso colaboraciones con la industria para exponer a los estudiantes a aplicaciones del mundo real de las herramientas digitales en ingeniería.

Los resultados de este estudio revelan un nivel moderado de competencia digital entre los estudiantes de ingeniería de primer semestre, con un promedio general de 62.74%. Esto coincide con los hallazgos de Díaz-Arce & Loyola-Illescas (2021), quienes observaron que, si bien los estudiantes universitarios están familiarizados con la tecnología, existe un amplio margen de mejora en sus competencias digitales dentro del entorno escolar.

La dimensión de organización mostró el promedio más alto (67.55%), mientras que el manejo de tecnología obtuvo el más bajo (58.33%). Esto sugiere que los estudiantes tienen habilidades para organizar información digital, pero pueden carecer de competencias técnicas más avanzadas. Este hallazgo se alinea con lo reportado por Guillén-Gámez et al. (2021), quienes enfatizaron la necesidad de fortalecer las competencias técnicas en los programas de formación universitaria.

La distribución equilibrada entre géneros (54.55% masculino, 45.45% femenino) en cuanto al uso de herramientas digitales contrasta con estudios previos que han señalado brechas de género en competencias digitales. Por ejemplo, Levano-Francia et al. (2019) habían identificado diferencias significativas en el uso de tecnología entre hombres y mujeres en educación superior, lo que sugiere que puede haber una tendencia hacia la equidad en este aspecto.

El alto coeficiente Alfa de Cronbach (0.963) del instrumento utilizado respalda su confiabilidad y validez. Esto es crucial considerando la importancia de contar con herramientas de medición robustas en el campo de las competencias digitales, como lo han señalado Palomino & Camillo (2021) en su revisión de instrumentos para evaluar competencias digitales en docentes.

La variación en los porcentajes de uso entre diferentes herramientas dentro de cada dimensión indica preferencias o mayor familiaridad con ciertas herramientas digitales. Esto se alinea con las observaciones de Molina-Montalvo et al. (2023), quienes encontraron que los estudiantes tienden a favorecer ciertas plataformas o aplicaciones basadas en su facilidad de uso y relevancia percibida para sus estudios.

El nivel moderado de competencia digital observado subraya la necesidad de integrar más efectivamente la alfabetización digital en los programas de estudio de ingeniería. Esto coincide con las recomendaciones



de Vera & García-Martínez (2022), quienes argumentan que las universidades deben adaptar sus currículos para incluir el desarrollo sistemático de competencias digitales, especialmente en disciplinas técnicas como la ingeniería.

Es importante reconocer las limitaciones del estudio para interpretar los resultados con cautela:

- **Tamaño de la muestra:** Con 44 estudiantes, nuestro estudio proporciona una visión valiosa pero limitada.
- **Enfoque en primer semestre:** Al centrarse en estudiantes de primer ingreso, capturamos una instantánea de sus habilidades al inicio de su formación. Un estudio longitudinal podría ofrecer insights sobre cómo estas competencias evolucionan a lo largo de la carrera.

Estas limitaciones, lejos de invalidar los hallazgos, ofrecen direcciones claras para futuras investigaciones y nos recuerdan la importancia de interpretar nuestros resultados como un punto de partida para una exploración más profunda.

Conclusiones

Esta investigación examina la utilización y las opiniones de los estudiantes de primer año de ingeniería respecto al empleo de instrumentos digitales revela varios puntos importantes:

El alto coeficiente Alfa de Cronbach (0.963) indica que el instrumento utilizado tiene una excelente consistencia interna y fiabilidad, lo que fortalece la validez de los resultados obtenidos.

Los alumnos demuestran un conocimiento intermedio de las tecnologías digitales, con un promedio general de 62.74% en el uso de herramientas digitales. Esto sugiere que, si bien los estudiantes están familiarizados con la tecnología, aún hay margen para mejorar sus habilidades digitales en el contexto educativo.

Entre las cuatro dimensiones evaluadas (información, comunicación, tecnología y organización), los estudiantes mostraron mayor competencia en aspectos de organización (67.55%) y menor en el manejo de tecnología (58.33%). Esto indica que los estudiantes podrían beneficiarse de una formación más enfocada en habilidades tecnológicas específicas.

La distribución relativamente equilibrada entre géneros (54.55% masculino, 45.45% femenino) indica que la diferencia de género en la utilización y acceso a herramientas digitales en este grupo de estudiantes es mínima.

La completitud de los datos (100% en variables, casos y valores) refleja un alto nivel de participación y compromiso de los estudiantes con el estudio, lo que aumenta la confiabilidad de los resultados.

Las variaciones en los porcentajes de uso entre diferentes herramientas dentro de cada dimensión indican que los estudiantes tienen preferencias o mayor familiaridad con ciertas herramientas digitales sobre otras. Esto podría guiar a los educadores en la selección de herramientas más efectivas para el aprendizaje.

El nivel moderado de competencia digital observado subraya la necesidad de integrar más efectivamente la alfabetización digital en los programas de estudio de ingeniería, especialmente en los primeros semestres.

La muestra, aunque limitada en tamaño y alcance, proporciona una visión valiosa de las habilidades digitales de los estudiantes de ingeniería de primer semestre, que podría servir como punto de partida para investigaciones más amplias y para el diseño de estrategias educativas que mejoren la competencia digital de los estudiantes.



Estas conclusiones resaltan la importancia de continuar desarrollando y adaptando las estrategias educativas para mejorar las competencias digitales de los estudiantes de ingeniería, preparándolos así para un entorno profesional cada vez más digitalizado.

Como líneas de investigación futuras:

- Impacto a largo plazo del uso de herramientas digitales en el desarrollo profesional de ingenieros: Esta área de investigación podría centrarse en llevar a cabo un estudio longitudinal que siga la trayectoria de los estudiantes de ingeniería desde el primer semestre hasta varios años después de su graduación. El propósito sería analizar cómo el nivel de competencia digital adquirido durante sus años universitarios impacta en su desempeño profesional, habilidad para adaptarse a nuevas tecnologías y oportunidades de crecimiento en sus carreras. Estos hallazgos ofrecerían información valiosa sobre la importancia y efectividad de las habilidades digitales adquiridas en la universidad en el entorno laboral real de la ingeniería.
- Desarrollo de un modelo predictivo de éxito académico basado en competencias digitales: Esta área de estudio se enfocaría en desarrollar un modelo predictivo que emplee la información sobre las habilidades digitales de los alumnos de primer año para predecir su desempeño académico futuro en la carrera de ingeniería. La investigación podría considerar factores adicionales como historial educativo, circunstancias socioeconómicas y preferencias en el estilo de aprendizaje. El propósito consistiría en descubrir tendencias y conexiones entre las destrezas digitales en etapas tempranas y el desempeño académico a lo largo de la trayectoria educativa, lo que habilitaría a las organizaciones a crear medidas de apoyo temprano y adaptadas para respaldar a los estudiantes en situación de riesgo de bajo rendimiento.

Referencias Bibliográficas

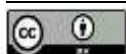
- Auteri, M., Lannutti, L., Pantuso, F., & Stella, F. (2020). Introducción a la Genética mediante el uso de herramientas virtuales. In *Memorias de las Jornadas Nacionales y Congreso Internacional en Enseñanza de la Biología* (Vol. 2, No. Extraordinario, pp. 173-173). <http://congresos.adbia.org.ar/index.php/congresos/article/view/127>
- Brown, C., & Salmi, J. (2020). *Putting fairness at the heart of higher education*. University World News. The Global Window on Higher Education. <https://www.universityworldnews.com/post.php?story=20200417094523729>
- Castellano Gil, J. M. (2020). Equipamiento, uso y consumo de TIC en estudiantes de educación en la Universidad Nacional de Costa Rica. *Revista Conrado*, 16(72), 334-341. http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1990-86442020000100334
- Carrera Farran, F. X., Vaquero Tió, E., & Balsells Bailón, M. (2011). Instrumento de evaluación de competencias digitales para adolescentes en riesgo social. *EduTec, Revista Electrónica De Tecnología Educativa*, (35), a154. <https://doi.org/10.21556/edutec.2011.35.410>
- Celina Oviedo, H., & Campo Arias, A. (2005). Aproximación al uso del coeficiente alfade Cronbach. *Revista Colombiana de Psiquiatría*, 34(4), 572-580. <https://www.redalyc.org/articulo.oa?id=80634409>
- CEPAL-UNESCO. (2020). *La educación en tiempos de la pandemia de COVID-19*. Informe COVID-19 CEPAL-UNESCO. https://repositorio.cepal.org/bitstream/handle/11362/45904/1/S2000510_es.pdf
- Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). SAGE Publications.
- de Soto García, I. S. (2018). Flipped Classroom como herramienta para fomentar el trabajo colaborativo y la motivación en el aprendizaje de geología. *EduTec. Revista Electrónica De Tecnología Educativa*, (66), 44-60. <https://www.edutec.es/revista/index.php/edutec-e/article/view/1239>
- Díaz-Arce, D., y Loyola-Illescas, E. (2021). Competencias digitales en el contexto COVID-19: una mirada desde la educación. *Revista Innova Educación*, 3(1), 120-150. <https://doi.org/10.35622/j.rie.2021.01.006>



- Díaz-Guecha, L. Y., & Márquez-Delgado, R. A. (2019). Tecnologías del Aprendizaje y el Conocimiento como estrategias en la formación de los docentes de la Escuela Normal Superior de Cúcuta, Colombia. *ÁNFORA*, 27(48), 17-40. <https://doi.org/10.30854/anf.v27.n48.2020.667>
- Elbashir, R. M., & Hamza, S. M. (2022). The impact of virtual tools on EFL learners' performance in Grammar at the times of COVID 19 Pandemic. *Journal of University Teaching & Learning Practice*, 19(3). <https://ro.uow.edu.au/jutlp/vol19/iss3/07>
- Feijóo, C., Fernández, J., Arenal, A., Armuña, C., & Ramos, S. (2021). *Tecnología educativa en China*. Instituto Nacional de Tecnologías Educativas y Formación del Profesorado. Obtenido de https://intef.es/wp-content/uploads/2021/11/2021_06_EdTech-China_INTEF_def.pdf
- Fernández-Sánchez, L., Martínez Gil, N., López Rodríguez, D., García Cabanes, M. C., Kutsyr, O., Noailles, A., ... & Maneu, V. (2019). *Herramientas digitales como recurso para la resolución de cuestionarios dentro y fuera del aula*. Alicante: Universidad de Alicante, Instituto de Ciencias de la Educación (ICE). <http://hdl.handle.net/10045/99178>
- Fucili, E., Masi, A., & Terranova, D. (2020). El uso de herramientas virtuales en la enseñanza de la historia en la universidad. *Virtualidad, Educación Y Ciencia*, 11(20), 182-191. <https://doi.org/10.60020/1853-6530.v11.n20.27455>
- García Aretio, L. (2021). COVID-19 y educación a distancia digital: preconfinamiento, confinamiento y posconfinamiento. *RIED. Revista Iberoamericana de Educación a Distancia*, 24(1), 09-32. <https://doi.org/10.5944/ried.24.1.28080>
- García Martín, J., & García Martín, S. (2021). Uso de herramientas digitales para la docencia en España durante la pandemia por COVID-19. *Revista Española de Educación Comparada*, 38, 151-173. <https://acortar.link/msgHlx>
- Gómez Collado, M. E., Contreras Orozco, L., & Gutiérrez Linares, D. (2016). El impacto de las tecnologías de la información y la comunicación en estudiantes de ciencias sociales: un estudio comparativo de dos universidades públicas. *Revista Innovación educativa* 16(17), 61-80. https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1665-26732016000200061
- González, N., Abad, J., & Lévy, J. (2006). *Normalidad y otros supuestos en análisis de covarianzas*. Editorial Netbiblo.
- González Benito, A. M., López Martín, E., Expósito Casas, E., & Moreno González, E. (2021). Motivación académica y autoeficacia percibida y su relación con el rendimiento académico en los estudiantes universitarios de la enseñanza a distancia. *Revista electrónica de investigación y evaluación educativa*, 27(2). <https://hdl.handle.net/11162/219307>
- Gonzales Arteaga, J. J., & Oseda Gago, D. (2021). Influencia de herramientas virtuales en el desarrollo de competencias digitales. *Ciencia Latina Revista Científica Multidisciplinar*, 5(4), 6073-6097. https://doi.org/10.37811/cl_rcm.v5i4.759
- Guillén-Gámez, F. D., Ruiz-Palmero, J., Palacios Rodríguez, A., & Martín-Párraga, L. (2021). Formación del profesorado universitario en Competencia Digital: análisis con métodos de investigación correlacionales y comparativos. *Hachetetepé. Revista científica De Educación Y Comunicación*, (24), 1101. <https://doi.org/10.25267/Hachetetepé.2022.i24.1101>
- Hernández Suárez, C. A., Prada Núñez, R., & Mariño, L. F. (2021). Educación mediada por las TIC en la educación superior en medio del periodo de aislamiento de la pandemia Covid-19. *Revista Boletín Redipe*, 10(10), 347-357. <https://doi.org/10.36260/rbr.v10i10.1491>
- Hernández, R. H., Collado, C. F., & Lucio, P. B. (2006). *Metodología de la investigación* (5a ed.). McGraw-Hill.
- Hernández, R., Fernández, C., & Baptista, P. (2020). *Metodología de la investigación* (7ª ed.). McGraw-Hill Education
- Huepe, M., Palma, A., & Trucco, D. (2020). Educación en tiempos de pandemia. Una oportunidad para transformar los sistemas educativos en América Latina y el Caribe. *Comisión Económica para América Latina y el Caribe (CEPAL)*. <https://acortar.link/mKdUbM>
- IESALC-UNESCO. (2020). *COVID-19 y educación superior. De los efectos inmediatos al día después. Análisis de impacto, respuestas políticas y recomendaciones* [Documentos de trabajo]. IESALC-UNESCO. <https://www.iesalc.unesco.org/wp-content/uploads/2020/04/COVID-19-070420-ES-2-1.pdf>



- Jiménez Galán, Y. I. Hernández Jaime, J., & Rodríguez Flores, E. (2021). Educación en línea y evaluación del aprendizaje: de lo presencial a lo virtual. *RIDE. Revista Iberoamericana para la Investigación y el Desarrollo Educativo*, 12(23). <https://mail.ride.org.mx/index.php/RIDE/article/view/1005/3111>
- Johnson, R. B., & Christensen, L. (2020). *Educational Research: Quantitative, Qualitative, and Mixed Approaches* (7th ed.). SAGE Publications
- Kukulska, A., & Traxler, J. (2007). *Mobile teaching and learning*. In *Mobile learning* (pp. 41-60). Routledge.
- Kumar, P., & Vasimalairaja, M. (2019). Digital tools in learning. In *National conference on cognitive and techno pedagogical skills for 21st century learners*. Alagappa University, 221 p. <https://acortar.link/NXRFqX>
- Levano-Francia, L., Sánchez, S. Guillén-Aparicio, P., Tello-Cabello, S., Herrera-Paico, N., & Collantes-Inga, Z. (2019). Digital Competences and Education. *Propósitos y Representaciones*, 7(2), 569-588. <https://dx.doi.org/10.20511/pyr2019.v7n2.329>
- Lloyd, M. (2020). Desigualdades educativas y la brecha digital. En J. Girón (ed.), *Educación y pandemia. Una visión académica* (pp. 115-121). UNAM. https://www.iisue.unam.mx/investigacion/textos/educacion_pandemia.pdf
- Marrero-Sánchez, O., & Vergara-Romero, A. (2023). Digital competence of the university student. A systematic and bibliographic update. *Amazonia Investiga*, 12(67), 9-18. <https://doi.org/10.34069/AI/2023.67.07.1>
- Martínez-Aguilar, J. M., & Pérez -Múzquiz, E. E. (2022). Las clases virtuales en México durante la pandemia. Ventajas y desventajas. *Revista Electrónica en Educación y Pedagogía*, 6(11), 71-82. <https://doi.org/10.15658/rev.electron.educ.pedagog22.11061106>
- Milá Pascual, M. de la C., Torres Milá, I., & Aties López, L. (2022). *La utilización de herramientas virtuales y su relación con el proceso educativo*. XIX Congreso de la Sociedad Cubana de Enfermería 2022. <https://acortar.link/PVXh71>
- Mitchell, T., & Herrera, S. (2020). Virtual Tools Show Promise for Moving the Needle on Culturally and Linguistically Diverse Family Engagement. *The Advocate*, 26(1). <https://doi.org/10.4148/2637-4552.1149>
- Molina-Montalvo, H. I., Macías Villarreal, J. C. y Hernández Fonseca, M. del R. (2023). Evaluando el uso de la plataforma Microsoft Teams en los procesos de enseñanza y aprendizaje durante la pandemia de COVID-19 en una universidad pública. Una perspectiva de los estudiantes. *IE Revista de Investigación Educativa de la REDIECH*, (14), e1633. https://doi.org/10.33010/ie_rie_rediech.v14i0.1633
- Monroy, A., Hernández, I., y Jiménez, M. (2018). Aulas Digitales en la Educación Superior: Caso México. *Formación universitaria*, 11(5), 93-104. <https://dx.doi.org/10.4067/S0718-50062018000500093>
- Mosquera Gende, I. (2022). Herramientas digitales colaborativas para la formación de futuros docentes en una universidad online. *REDU. Revista de Docencia Universitaria*, 20(1), 35-50. <https://doi.org/10.4995/redu.2022.16806>
- Palomino, M. R. Q., & Camillo, J. G. H. (2021). Competencias digitales en los docentes de educación básica del Perú. *South Florida Journal of Development*, 2(3), 3890-3904. <https://doi.org/10.46932/sfjdv2n3-007>
- Organista-Sandoval, J., Lavigne, G., Serrano-Santoyo, A., & Sandoval-Silva, M. (2016). Desarrollo de un cuestionario para estimar las habilidades digitales de estudiantes universitarios. *Revista Complutense de Educación*, 28(1), 325-343. https://doi.org/10.5209/rev_RCED.2017.v28.n1.49802
- Organización de las Naciones Unidas. (2020). *Policy Brief: Education during COVID-19 and beyond*. United Nations. <https://acortar.link/BBzQq>
- Otero, L. C. (2020). Herramientas digitales para la comunicación, la tele-docencia y la tele-orientación educativa en tiempos de COVID-19. *AOSMA*, (1), 92-111. http://aosma.es/wordpress/wp-content/uploads/2020/04/00_AOSMA_ESPECIAL.pdf
- Ramírez Montoya, M. S., McGreal, R., & Obiageli Agbu, J.-F. (2022). Horizontes digitales complejos en el futuro de la educación 4.0: luces desde las recomendaciones de UNESCO. *RIED-Revista Iberoamericana de Educación a Distancia*, 25(2), 09-21. <https://doi.org/10.5944/ried.25.2.33843>



- Ramos Hernández, D., & Maya Rosell, Y. (2022). Los juegos tradicionales y la motivación por el aprendizaje del idioma inglés. *Sociedad & Tecnología*, 5(3), 565–576. <https://doi.org/10.51247/st.v5i3.265>
- Rodríguez-Rodríguez, J., & Reguant-Álvarez, M. (2020). Calcular la fiabilidad d'un qüestionari o escala mitjançant l'SPSS: el coeficient alfa de Cronbach. *REIRE Revista d'Innovació i Recerca En Educació*, 13(2), 1-13. <https://doi.org/10.1344/reire2020.13.230048>
- Rodríguez Barboza, J. R., Ávila Sánchez, G. A., Pérez Saavedra, S. S., Rivera Rojas, C. N., & Acevedo Flores, J. (2022). Enfoque comunicativo como estrategia didáctica para mejorar la expresión oral del inglés en tiempos de pandemia. *Revista AVFT*, 41(1), 20-25. <https://doi.org/10.5281/zenodo.6370130>
- Santana-Mero, R. C., San Andrés-Laz, E. M., & Pazmiño-Campuzano, M. F. (2021). El trabajo colaborativo: una estrategia en la práctica del docente virtual. *Domino de las Ciencias*, 7(1), 909-924. <http://dominiodelasciencias.com/ojs/index.php/es/article/view/1685>
- Sunkel, G., & Trucco, D. (2010). *Nuevas tecnologías de la información y la comunicación para la educación en América Latina: riesgos y oportunidades*. Cepal.
- Tzenguzha-Abarca, F. X., Cárdenas-Cordero, N. M., Flores-Chuquimarca, D. K., & Brito-Albuja, J. G. (2021). Herramientas virtuales de aprendizaje para el desarrollo de la lectoescritura. *Revista Arbitrada Interdisciplinaria Koinonía*, 6(4), 351. <https://doi.org/10.35381/r.k.v6i4.1506>
- Universidad Nacional Autónoma de México (2021). *[Boletín UNAM-DGCS-379]. Avanza la UNAM en el uso de TIC para el aprendizaje e investigación. Dirección General de Comunicación Social*. https://www.dgcs.unam.mx/boletin/bdboletin/2021_379.html
- Vélez-Sabando, M. E., Chancay-García, L. J., & Zambrano-Acosta, J. M. (2022). Uso de las herramientas virtuales y el aprendizaje gamificado en los estudiantes del 2022. *Revista científica multidisciplinaria arbitrada Yachasun*, 6(10 Ed. esp), 98-117. <https://doi.org/10.46296/yc.v6i10edespab.0167>
- Vera, F., & García-Martínez, S. (2022). Creencias y prácticas de docentes universitarios respecto a la integración de tecnología digital para el desarrollo de competencias genéricas. *Revista Colombiana De Educación*, (84), 1-16. <https://doi.org/10.17227/rce.num84-11582>
- Xie, Y. M. S. (2020). *Marketing herramientas, técnicas y estrategias digital* (2 ed.). RA-MA Editorial.
- Zuluaga-Gómez, M., & Valencia-Ortiz, N. L. (2021). Educación en facultades de medicina del mundo durante el periodo de contingencia por SARS-COV-2. *MedUNAB*, 24(1), 92-99. <https://doi.org/10.29375/01237047.3942>




DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.8>

Cómo citar:

Alekseiko, V., Savina, I., Khallo, O., Ihnatenko, O., & Andreikova, I. (2024). Effectiveness of using digital interactive projection media systems in teaching vocational subjects and in professional activities. *Revista Eduweb*, 18(3), 88-105. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.8>

Effectiveness of using digital interactive projection media systems in teaching vocational subjects and in professional activities


Efectividad del uso de sistemas de medios de proyección digitales interactivos en la enseñanza de materias vocacionales y en actividades profesionales

Vitalii Alekseiko <https://orcid.org/0000-0003-1562-9154>

WoS Researcher ID: KIA-1707-2024

vitalii.alekseiko@gmail.com


Master of the Faculty of Information Technology, Computer Engineering & Information Systems Department, Khmelnytskyi National University, Ukraine.

Inna Savina <https://orcid.org/0000-0002-7718-3488>

WoS Researcher ID: KTI-0298-2024

savinainna48@gmail.com


Candidate of Pedagogical Sciences, Major, Lecturer of the Department of Military History of Ukraine, Educational and Scientific Institute of Military History, National Defense University of Ukraine, Ukraine.

Oleksandra Khallo <https://orcid.org/0000-0003-3383-8486>

WoS Researcher ID: KVB-7568-2024

luska.if@gmail.com

Doctor of Medicine, Associate Professor, Department of Hystology, Cytology and Embryology, Ivano Frankivsk National Medical University, Ukraine.

Oleksandr Ihnatenko <https://orcid.org/0000-0003-4892-1821>

WoS Researcher ID: AAA-1272-2022

sashagid@gmail.com

Candidate of Pedagogical Sciences (PhD), Associate Professor of the Department of Theory and Methodology of Primary Education, Oleksandr Dovzhenko Hlukhiv National Pedagogical University, Ukraine.

Iryna Andreikova <https://orcid.org/0000-0002-3409-2383>

WoS Researcher ID: HKW-8044-2023

irene.ortie@gmail.com

Doctor of Philosophy, Assistant Professor, Assistant Professor of the Foreign Languages Department, Odesa Polytechnic National University, Ukraine.

Recibido: 11/06/24

Aceptado: 29/08/24

Abstract

The article shows the technology's effectiveness and reveals the students' readiness to use digital interactive projection media systems in educational and professional activities. The content of the



interactive education process and its components are disclosed. The essence and significance of digital interactive projection media systems in teaching professional subjects are shown. As an example of digital interactive projection systems, an effective interactive software-technological complex based on SMART Board is shown, the interactive functions of the interactive SMART Board software created specifically for the educational space in teaching vocational subjects and the advantages of the interactive panel in the educational space of a higher school are revealed. Ways of developing the teacher's professional competencies when using an interactive panel or blackboard in classes at a higher school are analyzed. The effectiveness of electronic textbooks, manuals electronic educational and methodological complexes, informative and reference multimedia publications, game educational and developmental publications, scientific research STEM centers, multimedia classes, virtual laboratories, virtual classes, etc. in teaching vocational subjects is shown.

Keywords: digital interactive projection media systems, education, professional activity, students, innovative activity, higher education institutions.

Resumen

El artículo muestra la eficacia de la tecnología y revela la disposición de los estudiantes para utilizar sistemas de medios de proyección digitales interactivos en actividades educativas y profesionales. Se divulga el contenido del proceso educativo interactivo y sus componentes. Se muestra la esencia y la importancia de los sistemas de medios de proyección interactivos digitales en la enseñanza de materias profesionales. Como ejemplo de sistemas de proyección interactivos digitales, se muestra un efectivo complejo tecnológico-software interactivo basado en SMART Board, las funciones interactivas del software interactivo SMART Board creado específicamente para el espacio educativo en la enseñanza de materias vocacionales y las ventajas del panel interactivo en Se revela el espacio educativo de una escuela superior. Se analizan formas de desarrollar las competencias profesionales del docente al utilizar un panel o pizarra interactiva en las clases de una escuela superior. Se muestra la efectividad de los libros de texto electrónicos, manuales de complejos educativos y metodológicos electrónicos, publicaciones multimedia informativas y de referencia, publicaciones educativas y de desarrollo de juegos, centros de investigación científica STEM, clases multimedia, laboratorios virtuales, clases virtuales, etc.

Palabras clave: sistemas de medios de proyección interactivos digitales, educación, actividad profesional, estudiantes, actividad innovadora, instituciones de educación superior.

Introduction

The modern stage of informatization of society is the digitalization of the modern educational process of higher education, which involves the saturation of the learning space with electronic and digital devices, systems, means and the establishment of an electronic communication exchange of information and educational environment between them, which creates a cyber-physical educational space of higher education institutions (Spirin, 2021).

In the conditions of intensive progress of digital interactive projection media systems, in modern conditions of renewal of all spheres of the spiritual life of a person and the social life of society, the higher education system needs a new qualitative level of development of the educational universe, which would meet international standards. Therefore, innovative and developing digital interactive projection media systems are gaining more and more popularity. Personally oriented educational technologies of the organization of the educational space of the higher school come to the fore as a type of pedagogical activity, and the student is at the center of the innovative educational process (Bonch-Bruievych & Nosenko, 2010).

European organizations consider the development of new digital interactive projection media systems, interactive courses, their support and administration as a priority direction for improving the quality of education, in particular, distance education. 25% of the volume of the European market in the field of high-tech innovative distance education (according to research company IDC) is represented online (England,



the Netherlands, Sweden). More than 50% of master's degree programs in the UK in the field of management are conducted using interactive methods, and digital interactive projection media systems. The country in the world with the highest index of Internet activity is Iceland (98%), in the USA the Internet and digital interactive projection media systems are used by 77% of the population, and in Ukraine – 34% (Knysh et al., 2023).

In modern society, there is a corresponding shortage of highly qualified specialists, due to the growth of innovative technologies, and the volume of human knowledge, which is transformed into all aspects of the life of society. Therefore, in modern conditions, it is important to use digital interactive projection media systems when organizing the training of specialists.

And, as a result, digital interactive projection media systems for increasing the level of quality and efficiency of education have great potential and are dynamically developing. The main advantage of digital interactive projection media systems is to approach the real practical activities of specialists in the learning process. Digital interactive projection media systems help to correctly formulate one's own opinion, learn to solve problems, contribute to the optimization and intensification of the educational process, help to discuss, and analyze the information received, defend one's point of view, allow the student to be more independent and confident.

The use of digital interactive projection media systems allows you to relieve the nervous load of students in the learning process, makes it possible to switch attention to key issues when working on a certain topic, change forms of activity, promotes the development of communication skills and abilities (Hevko, 2018).

Literature Review

The effectiveness of the use of digital interactive projection media systems in education suggests that scientists have begun to pay due attention to them. Thus, scientists devote research to interactive technologies in education. I. Hevko (2018) examines the peculiarities of their application and distinguishes the varieties in the educational process. The scientist considered the main problems of the quality of education and considered the conditions for using interactive growth technologies as the main component of the professional issue. The necessity of using digital interactive projection media systems in education has been proven, which affects the improvement of the efficiency of the education system by introducing new approaches to the methodology of conducting seminars, practical classes, and lectures. It is proven that as a result of the optimal use of digital interactive projection media systems in education, positions in the educational process of the teacher and student change. The teacher turns into an organizer of students' cognitive activity, and students become equal subjects in education.

H. Bonch-Bruievych, & T. Nosenko (2010) reveal the importance of the SMART Board software-technological educational complex with software of the 10th version, providing information about tools, purposes, highlighting the main capabilities, practical recommendations, tools for creating interactive classes in the SMART Notebook software environment TM10. They prove that the use of digital interactive projection media systems in education contributes to the optimization and intensification of the educational process, helps to analyze the received information; correctly formulate one's own opinion, learn to solve problems; discuss, and defend one's point of view; to be more confident and independent.

P. Shevchuk, & P. Fenrich (2005) consider practical issues and theoretical principles of using interactive learning methods for the system of higher education institutions. Considerable attention is paid to the application of digital interactive projection media systems in education, organizational, and methodological approaches in the use of non-game and game simulation methods, aimed at consolidating and accumulating knowledge in the objects of the educational process and practicing sustainable skills and abilities.



S. Lytvynova (2011) raises the problem of modernizing the computer-oriented environment of the higher school for individual education of students with modern means; defines the concept of a virtual class, the place of a virtual class among modern computer-oriented teaching aids; analyzes possible systems of full-time education of students using ICT; the concept of web conference and video conference describes the role of online seminars, presents a model of integration of the virtual classroom as a computer-oriented learning environment in the educational process.

Modern education is focused on the development of the independent cognitive activity of students, therefore, K. Nikolenko, Y. Korneiko, & O. Dobrostan (2023), taking into account the individual characteristics of students, consider the use of effective pedagogical technologies, which one of the main directions of the development of the educational process on a grid scale. The scientists analyzed the application of digital interactive systems in education, the main aspects of mobile learning, and interactive technologies in it, which is a way of organizing the educational process, which uses forms based on the interaction of all learning participants and methods of collective scientific knowledge. It has been proven that interactive technologies should be introduced into the process of studying all disciplines to promote the effectiveness of mobile learning. Ways of using a combination of online platforms, interactive textbooks, mobile applications, social networks, QR codes, the project method, cooperative "inverted" learning, and their main advantages and disadvantages are shown. Also, I. Truskavetska (2023) considered the positive aspects and showed minor disadvantages of using various applications, mobile devices, and online services in the educational process of higher school, which allow teachers to create educational materials of augmented reality and interactive textbooks. The study shows the main paths of education seekers, which provide an opportunity to interact with animations and 3D models, virtual objects, which makes the process of higher education effective and interesting.

The use of interactive technologies and the use of digital interactive projection media systems in education have some challenges, which were analyzed by N. Shakun, O. Zivenko, & I. Salnyk (2023). The formation of digital literacy in a student and the formation of digital competence in him indicates the mandatory use of digital technologies in higher education and creates a basis for professional activity to be able to use digital technologies. It has been proven that digitalization in institutions of higher education ensures the formation of competitive specialists, and promotes the flexibility of the educational process, which enables a student, a future specialist, to quickly adapt to rapidly changing and unpredictable conditions.

An analysis of mobile technology and systems of the educational space of the higher school by V. Matsiuk, & I. Pryimak (2022) was made. It has been proven that m-learning is a necessary component of the modern educational process. It is difficult to imagine a modern occupation without the use of gadgets by students, in particular, during the implementation of distance education. The need to use BYOD technology is shown, which makes it possible to bypass the lack of equipment during the experiment and develop skills for similar experiments during independent reproduction by students while working at home.

M. Vykhrystiuk, & I. Salnyk (2022) revealed the history of the development of electronic learning (E-learning), examined the negative and positive sides of one of the forms of E-learning, showed the prerequisites for the emergence of a new educational technology, namely mobile learning m-learning. They proved that with the improvement of the technical part, the prospects for the development of such technologies can be overcome very quickly. The scientists characterized the expediency of implementing digitalization in education, systematized regulatory and legal documents proving the importance of this process; and revealed the essence of the concepts of "digitalization" and "professional training".

The need for digital transformation of the education system is substantiated by O. Tsiuniak, & L. Sultanova (2021), and ways of organizing an innovative educational process in higher education institutions with the introduction of digital and innovative technologies and systems are shown. It has been proven that in the conditions of digitalization, the primary tasks of the development of modern higher education should include not only the resource-filling of the educational environment with modern digital means of learning but also the preparation of higher education students and teachers for their effective use. Therefore, it is expedient in institutions of higher education to equip the premises with new models of technical means of education,



where classes are held. These are multimedia classrooms, and Internet classes, to conduct educational classes using digital and multimedia technologies. Digital transformation of education contributes to the achievement of new educational results and strengthens students' motivation for self-development and self-education.

Therefore, the analysis of scientific sources shows that scientists devote research to interactive technologies in education, consider the main problems of the quality of education and consider the conditions for using interactive technologies for personal growth as the main component of a professional issue; show the importance of the software-technological educational complex SMART Board with software of the 10th version, providing information about tools, purposes, highlighting the main capabilities, practical recommendations, tools for creating interactive classes in the SMART Notebook™10 software environment; define the concept and show the importance of the virtual class in education, the place of the virtual class among modern computer-oriented teaching aids; analyze possible training systems for education seekers using ICT; the use of effective pedagogical technologies, which is one of the main directions of the development of the educational process on a global scale; talk about the need to use various applications, mobile devices, online services in the educational process of a higher school, which allow teachers to create educational materials of augmented reality and interactive textbooks. Therefore, it is expedient in institutions of higher education to equip the premises with new models of technical means of education, where classes are held.

The aim of the study: to show the effectiveness and reveal the level of readiness of students to use digital interactive projection media systems in educational and professional activities

Methodology

During the study of the effectiveness of the use of digital interactive projection media systems in the teaching of vocational subjects, scientific research methods were used, such as:

- The method of analysis, which made it possible to consider the content of digital interactive projection media systems, and their main characteristics in education, to identify the impact on the educational process and to highlight their features;
- The synthesis method made it possible to highlight key aspects for further research and to summarize the obtained data.
- The method of systematization was used to structure information about the challenges and differences that students face in education;
- The decomposition method made it possible to divide complex tasks into smaller elements for detailed analysis;
- The method of generalization made it possible to formulate conclusions regarding the influence of digital interactive projection media systems on the effectiveness of education.

Empirical methods, in particular:

- *Prognostic*, which included the generalization of independent characteristics and expert assessments;
- *Diagnostic*, which included interviews, questionnaires, and surveys;
- *Observational* methods – self-observation, observation, self-assessment – to identify the level of readiness of future specialists to use digital interactive projection media systems;
- *Experimental* methods: experimenting to check the level of readiness of future specialists to use digital interactive projection media systems.

Mathematical statistics methods – for analyzing the obtained results based on establishing quantitative indicators for evaluating the phenomenon under study and confirming their probability.



With the possibility of quantitative and qualitative further analysis of the results, our study was based on an online survey. Respondents of the survey were those with higher education (127 respondents).

To check the effectiveness of the use of digital interactive projection media systems in higher schools in teaching vocational subjects, a pedagogical experiment was conducted in the real conditions of the educational process.

Preparation for the experiment involved the solution of the set tasks:

- Provision of equal initial conditions for the control and experimental groups (training of teachers, success results, number of students);
- Development and selection of diagnostic methods;
- Determining the duration of the experiment;
- Definition of the levels at which we talk about changes in experimental groups.

The purpose of the experiment is to identify the level of readiness of students to use digital interactive projection media systems in educational and professional activities

Levels of students' readiness to use digital interactive projection media systems in educational and professional activities have been established.

As a result of the study, the students of the experimental groups showed better results in terms of the formed readiness to use digital interactive projection media systems in educational and professional activities than the students of the control groups, which indicates an improvement in the results of the assimilation of the educational material by students, which was studied with the help of the use of digital interactive projection media systems, as well as that, that the implementation of the proposed course "Application of digital interactive projection media systems in the teaching of vocational subjects" with the use of innovative methods contributed to increasing the level of students' readiness to use digital interactive projection media systems in professional activities. A sign criterion was used to identify the level of formation of the application of digital interactive projection media systems.

In the study, we used the Student's t-test.

The results of the experiment make it possible to conclude that the introduction of the course "Application of digital interactive projection media systems in the teaching of professional subjects" in the training of future specialists contributed to increasing the level of students' readiness to use digital interactive projection media systems in professional activities.

Results and Discussion

The content of the interactive process in education and its content components.

An innovative modern educational system is a systemically organized set of educational and methodological, technical, informational, and digital support of the educational process, which is inextricably linked with a modern innovative person as a subject of education. An innovative modern educational system is emerging thanks to a set of conditions that ensure the educational process of a higher school: the presence of a system for independent work with information; cognitive educational activity; availability of a system of means of "communication" with information; the presence of intensive ties between the participants of the educational process. To ensure a high-quality, innovative, modern educational system, a higher education institution must have a modern technical base: computer classrooms, powerful computers, interactive whiteboards, multimedia projectors, etc. In the conditions of the organization of distance and mixed learning, in recent years, this is the main condition for educational practice – the introduction of new digital technologies (Hrytsenko, 2023).

Considering the role of digital interactive projection media systems in education, let's consider the essence of the interactive process. Interactive means capable of dialogue, interaction, and interactive technology of



the educational process is a specific model in the organization of cognitive activity, the scientific basis of which is person-oriented learning and its conceptual provisions. Interactive technology in the educational process has a predictable and specific goal, the achievement of which is possible by creating comfortable and innovative conditions of the educational process, under which every student feels intellectual ability and success. The essence of the interactive process is that in the institution of higher education, the educational process takes place under the condition of positive, active, constant interaction of all students of higher education. There is cooperative learning, group, collective, and individual learning when students and the teacher are equal subjects of the educational process (Bonch-Bruievych & Nosenko, 2010).

Services and products on digital computer systems include interactive media that constantly respond to meaningful learning of the user, to his actions, presenting the necessary innovative content, such as graphics, text, animation, audio, video, games, etc. (Marrero-Sánchez & Vergara-Romero, 2023).

The use of digital, interactive technologies, information and communication technologies, electronic interactive projection media systems, and online platforms in education have become the basic tools of mobile and distance learning. It is this innovative toolkit that constitutes the organization of a high-quality educational process, where methods and forms of scientific collective cognition are used, based on the interaction of all participants in the educational process of a higher school. This approach to education allows the creation of conditions for an innovative model of the modern educational process:

- Ensuring the equality of participants in the modern educational process;
- Ensuring free adoption of positions and free exchange of opinions;
- A positive and free atmosphere of learning and education;
- Awareness of the value of forming collective conclusions;
- Recognition of the teacher as an adviser and mentor, and not as a tool of "praise and punishment" (Zinoruk, 2022).

The essence and significance of digital interactive projection media systems in teaching vocational subjects.

Digital interactive projection media systems in the teaching of professional subjects with the use of various playback and recording devices allow you to organize a dialog exchange of various types of audiovisual information: display, audio system, TV, microphone, etc.; designing pleasant-to-use interactive systems that make people's lives easier and perform useful functions. The possibility of storing huge, interactive access to the elements of arrays of information is provided, and with the appropriate sound accompaniment of the reproduction of images.

The design of digital interactive projection media systems in the teaching of vocational subjects should be accessible, useful, and interesting – related to the development of interactive high-quality products that will fit people's lifestyles.

Digital interactive projection media systems are high-tech multimedia devices capable of transmitting images to various surfaces using a projector – horizontal table surfaces, glass screens, walls, floors, etc. You can combine images on the floor and the wall so that they logically complement each other. It is possible to scan human movement thanks to the installed infrared sensors, which the system responds to using numerous visual effects (the variety and number of which are unlimited) and attracts the attention of viewers because it instantly transforms the image.

Such processes are well visualized with the help of digitalization of interactive effects, such as the change of new and old, the transition from one state to another, and the emergence of new objects.



Significance for the educational space of the interactive whiteboard.

An example of a digital interactive projection system can be an interactive software and technology complex based on SMART Board, created by the Canadian company SMART Technologies Inc. (www.smartboard.com.ua), which is now the most common technical base in educational institutions and is used in teaching vocational subjects in an interactive educational environment, is an interactive educational complex, which is also called "interactive whiteboard", allows the use of innovative pedagogical technologies education along with traditional ones and to create an interactive information and communication environment of the educational space.

Interactive software and technology complex based on SMART Board consists of proprietary software and hardware. The component of the hardware part of the complex is based on the SMART Board interactive board. For the complex to become interactive, and the interactive board to perform its functions, a desktop or portable personal computer, communication equipment, and a multimedia projector are needed.

The basis of the work of the interactive software-technological complex is the software specially developed for training, the technological and software product SMART Board software. Its versions are constantly improved and updated. The basis of specialized Notebook software is the SMART Notebook™ 10th version application, which is important for the educational process of a higher school using SMART Technologies interactive devices (AirLiner™ wireless tablets, Sympodium™ tablets, SMART Board interactive boards, SENTEO™ survey system). SMART Board software provides the ability to create compositions from graphic fragments and text fragments, allows you to control applied computer programs by touching the surface of the screen, serves to store the created materials and reproduce them during the demonstration, provides a universal technology for working with various types of information, gives the teacher an effective means of applying and creating author's educational programs in the teaching of vocational subjects (Bonch-Bruievych & Nosenko, 2010).

The interactive whiteboard includes a large touch screen, a projector, and a computer as part of the system. From the image projected on the board, it is possible to make marks and changes while working. All changes are recorded in the corresponding files on the computer, which are saved and edited or copied to other media. In this case, the interactive whiteboard does not work as an information transformer, but as an information input device.

The design of digital interactive projection media systems is an exciting and complex field that influences and relies on the peculiarities of people's lives. There is a wide variety of digital interactive media systems and products, from websites to business applications. The design of digital interactive media systems should be primarily human-oriented. They are necessary for the era of digital technologies in which we live when bits are easily transmitted and transformed, applied in various subject areas.

An interactive whiteboard with a touch-sensitive screen is a computer peripheral device, that creates favorable conditions when working with a large audience and performs the innovative function of an additional, enlarged computer monitor (Tolochko et al., 2023).

Work with an interactive whiteboard is accompanied by the use of additional technical means (testing system) (Kozmenko et al., 2022). When teaching vocational subjects, the teacher asks a question or shows the text of the question on the blackboard with options for answers, students, by pressing the appropriate button on the remote control, choose the correct answer options. The answers are analyzed, and the results can be displayed visually (tables, diagrams) on an interactive whiteboard or entered in a journal. The document lamp allows you to display the image of any object or document directly on the screen. When analyzing homework, you can analyze the correctness of the task, and immediately demonstrate the students' work. You can bring small objects to the screen in an enlarged form and examine them in all detail. Interactive digital complexes can be equipped with other auxiliary devices: markers, styluses, tablets for remote control, etc. (Hevko, 2018).



Interactive functions of SMART Board interactive whiteboard software created specifically for the educational space when teaching vocational subjects.

Let's highlight the interactive functions of SMART Board interactive whiteboard software created specifically for education:

1. *Management from the surface of the board by applied computer programs.*
2. *Processing of graphic images, text information, video, and audio files on the touch surface of the board with the help of hand movement, which allows:*
 - Move around the axis, zoom in and out, clone, group, delete, ungroup, move to a new file page and back;
 - Move any image (screen with a video clip, printed or written word, number, letter, shape, line, photo, etc.) on the surface of the board to any place on the board;
 - From a network resource of any level to the surface of the board, move any files (graphics, text, hyperlinks, video, etc.) from the hard disk of the computer, perform and open any actions with the contents of the files by touching the icon with your finger these files;
 - By cutting out fragments of video films, to frame-by-frame coverage of materials, parts of printed text, and parts of photographs with the necessary objects, combine them with text and graphic information on the surface of the board, move to a new page file and back when teaching subjects of a professional direction;
 - Make and save in the computer memory, a complete video recording of the entire process of working on the board with information objects, creating your own collection of video recordings of the lessons.
3. *Creation of author's educational programs, which allow:*
 - Create educational material directly during the class using the simplicity of information technology, using the program tabs "Gallery", "Applications", "Page Sorter", "Properties", Internet and local network resources;
 - By adding or removing page files – to form the structure of a training session of a professional direction, using the "Page Sorter" program tab;
 - In advance, during the lesson, import or prepare hyperlinks, graphic objects, text files, videos, and photos in the structure of page files using the "Appendixes" program tab;
 - Using the "Gallery" program tab, by the lesson scenario, use a large number of different templates, drawings, information objects, etc. in teaching vocational subjects;
 - prepare in advance, save the educational material, and demonstrate it on the board in the form of a series of slides with graphic comments (Dzhurynskiy et al., 2023).

In teaching professional subjects, it is very important that the creation and editing of objects can be carried out directly in Word, PowerPoint, Excel, etc. applications, and the entire process on the work screen can be recorded in a video file, then played back on the screen using a universal player or on a computer monitor. Manually entered text is automatically recognized electronically (Bonch-Bruievych & Nosenko, 2010).

The advantages of an interactive panel in the educational space of a higher school.

An interactive panel is a device that combines the functionality of a whiteboard, a computer, a projector, a tablet, and a modern TV in a shockproof, ultra-durable case.

The technologies used in the interactive panel are divided into the following types:



- Electromagnetic;
- Analog-resistive sensor;
- Laser;
- Ultrasonic (infrared) (Plakhotnik et al., 2023).

The advantages of using interactive panels in the educational process during classes include (Kuchai et al., 2022):

- Stimulation of professional growth;
- Possibility of animation and modeling of various phenomena and processes;
- Saving time in class;
- Demonstration of professional personal experience;
- Interactivity and visualization;
- Multiple uses of the material;
- Organization of test control of higher education applicants;
- Rational use during the educational process of the higher school.

We will analyze the development of the teacher's professional competencies when using an interactive panel or blackboard in classes at a higher school.

1. Competence of active involvement in the educational process of students of higher education. When conducting classes in the teaching of vocational subjects, the use of various dynamic resources contributes to a convenient test of students' knowledge, increases motivation, and develops discussion.
2. Competence in creating demonstrations, presentations, and models. In combination with an interactive panel, the use of resources and the necessary software helps the teaching staff to present information with the help of various multimedia resources, which provides an opportunity to study the material in maximum detail and comment on it. When explaining concepts and abstract ideas, it is a valuable tool for teachers, helping to explain solids and schemes. With this approach, students can comment on their actions, think aloud, gradually write down ideas on the board, and involve their colleagues in this.
3. Competence to improve the flow and pace of the lesson.

The teacher has the opportunity to simultaneously influence the auditory, visual, and kinesthetic systems of a person, and focuses on each student in the group when teaching vocational subjects. Therefore, a lesson using the panel helps the teacher to develop his competencies and professional skills, to solve such tasks as introducing novelty into the educational process, mobilizing the mental activity of students, increasing the possibility of involuntary memorization of the material, increasing interest in the lesson, systematizing and highlighting the main points in the material teaching vocational subjects (Kuchai et al., 2017).

Electronic textbooks, manuals electronic educational and methodical complexes, informative and reference multimedia publications, game educational and developmental publications in the teaching of vocational subjects.

Electronic textbooks, manuals, and electronic educational and methodological complexes using hypertext technologies include structured and interconnected hypermedia and multimedia texts, maps, biographies and portraits of historical figures, documents, dictionaries of concepts and terms, chronological tables, illustrative material, for testing knowledge and skills – test program by topic, video fragments studied in the training course. Several e-textbooks create an e-library. Electronic educational and methodical complexes of vocational subjects include all components of the educational course (working curriculum, discipline curriculum, models or materials of practical classes, lectures, illustrations, test forms of knowledge control, tasks for independent work, etc.).



Informational and reference multimedia publications – electronic galleries, Internet resources, encyclopedias, in particular, "Wikipedia", which contains illustrations and interesting information from the course, educational subjects, and educational field.

Game educational and development publications – increase interest in a game form to study the course and are created taking into account the age characteristics of the students of education (Hrytsenko, 2023).

Development and implementation of equipment for creating an electronic digital educational environment, innovative computer, multimedia, and computer-oriented learning tools: research STEM centers, multimedia classrooms, virtual laboratories, virtual classrooms, etc.

STEM research centers/laboratories use high-tech up-to-date equipment and teaching aids related to electrical engineering, scientific research in the field of nano-, bio-, energy-saving technologies, technical modeling, automation, IT technologies, robotics, telemechanics, radio engineering and electronics, intelligent systems, aerospace engineering, aviation, etc.

It is appropriate to use the resources of STEM centers/laboratories of scientific and technical stations/laboratories and higher education institutions, which contain a significant number of lectures, video recordings of experiments, methodical developments, and proposals for cooperation in researching while mastering professional subjects.

In addition to traditional means of education, there are open educational Internet resources that provide equal access to quality education for young people, provide learning opportunities for people with special needs, and also ensure the use of various forms of learning (group work, individual learning, project activities, frontal work).

Virtual laboratories, interactive museums, educational sites, and simulation simulators make the learning process creative and accessible – conducting research experiments. So, on the one hand, positive motivation is created for students to master STEM disciplines through the use of high-quality educational Internet resources, and on the other hand, all subjects of the educational process are given the opportunity for collective educational activity, in which the teacher can recommend various educational Internet resources to students for use in self-education.

With the development of technology, projection games, interactive projection with interactive modules, projectors, and other equipment are becoming more and more interesting and innovative. In particular, combined with the medium of creative interactive game content, interactive projection by interactive modules, projectors, and other equipment serves not only for entertainment but also to achieve communication and interaction with students. Interactive projection allows students to have fun and learn during the game. That is why it is preferred by educational institutions because the interactive mode of the game is full of creativity, is changeable and new, and allows you to better enter the game. The Mimio interactive learning system, and the ChariotTech interactive projection system, which consists of a 3D learning system, include the logic of numbers, letters, and interactive stories to help students learn are significant.

Recently, virtual classes for the organization of educational space have become widespread. This educational model of learning is as close as possible to online learning in a real classroom.

To form a virtual class, we use the latest technologies of conference communication. A new service for training provides us with such opportunities – a virtual platform that is being developed for training and holding webinars, and web conferences as a cross-platform.

According to all the indicators of expanded capabilities, cost, and accessibility, we chose the cross-platform WiZiQ for implementation in the educational plane of the higher school. This service provides an opportunity



to teach students online in real-time and create virtual classes. Teachers have the opportunity to create and fill profiles related to their educational activities, to create a library of presentations and books. Therefore, a virtual class is a student's face-to-face training, and it is not distance learning in the traditional sense, which is implemented in higher education using modern Internet technologies.

A virtual class is like a special educational environment, a community of a larger number of people or two people present virtually in a virtual classroom, who carry out educational and cognitive activities in real-time, integrating information and communication technologies and the Internet by jointly chosen goals of the educational space (Bykov, 2008) in which the educational process is carried out innovatively and unites students and the teacher with common educational tasks and goals, who does not need to know additional software products to use the virtual classroom. Such tools as the usual interactive whiteboard, web camera, chat, microphone, etc. are familiar to any teacher. Therefore, the training of the administration and teachers does not require the study of additional complex computer databases, computer platforms, and data that do not cause negative emotions, because in the provision of educational services, this is a new informational step.

The introduction of virtual classes into the system of higher education is an urgent solution to the problems of students who study under individual programs and is an indispensable factor for the development of gifted students, a means of strengthening the influence of specialization on the learning process (Lytvynova, 2011).

The creation of an electronic educational environment in institutions of higher education for the study of vocational subjects is carried out by:

- Automation of the processes of students' educational activities;
- Informatization in higher education institutions of the activities of individual structural divisions;
- Application of electronic learning elements in the educational environment;
- The use of interactive learning to form a new educational space;
- Provision of wide access to local services to those seeking higher education, etc.

In institutions of higher education, a technology based on the use of hi-tech has recently become more widespread, this is the technology of electronic education (e-learning), which includes:

- Use of audio and video accompaniment in educational activities;
- Educational and methodical provision of the educational process of the higher school with online means of information use, on electronic media;
- On-line and off-line multimedia training methods;
- Formation of an innovative environment for students to acquire knowledge.

Such an educational approach through the transition to the forms and principles of open educational communication allows for the modernization of higher education and leads to a comprehensive update of the entire information support system of the institution of higher education, which is based on providing education with flexible access, taking into account social, geographical, and time constraints (Budnyk et al., 2022).

The rapid development and introduction of computer technologies into the educational activities of higher education institutions confirms the need to solve a wide range of tasks related to both the improvement of the educational process itself and infrastructure support. Therefore, it is advisable to carry out the following steps of the institution of higher education when mastering the subjects of a professional direction:

- 1) Creation of new technical and technological, psychological and pedagogical services, information and analytical laboratories, educational and scientific information library centers, information technology centers, etc.;



- 2) To make innovative information and publishing activities: production of electronic resources, electronic educational products, heuristic educational programs, subject data banks, etc. (Tsukanova et al., 2023)

To support the educational process, practical experience in the use and implementation of new digital solutions in higher education, focused on the centralization of access to distance education and the spread of interactive learning, is necessary (Rojas-Bahamón & Arbeláez-Campillo, 2023). The process of implementing distance education in a higher education institution involves the use of a specialized environment, the individualization of curricula, the resolution of the following issues: the regulation of the educational process of higher education regarding the definition of blocks, topics of disciplines through the mutual exchange of information between students of higher education and teachers, the use of active educational communications by students of higher education education and elements of a specialized information environment; maximum access to objects and information resources, information about the higher school, units; publication of educational and methodological publications, electronic educational and methodological manuals; technical and technological transformation into a network communication platform; creation of electronic educational and methodical complexes; stimulating the creation of new educational tasks online; the use of cross-media communications (with the help of mass media information distribution service); providing with the help of any device and any communication channel the ability to communicate in a network technological specialized environment, which is the basis for voice, video and mobile communications, data convergence in an integrated, secure, unified architecture; the organization of a special social-communication, psychological-pedagogical unit of the higher school, which carries out:

- Planning step-by-step, step-by-step implementation of distance learning,
- Constant flexible financial methodical regulation in the educational process of systematic implementation of new forms and means and monitoring (Sulym et al., 2023).

Effective informativeness and effectiveness in providing the educational needs of students of higher education in the formation of an interactive educational environment in modern learning technologies are achieved through the consolidation of all participants in educational and pedagogical activities when teaching professional subjects (Lishchynska, 2018).

Digital interactive projection media systems in the teaching of vocational subjects allow:

- Rationally organize the educational process of the higher school;
- To develop research skills;
- To provide positive motivation for learning;
- To ensure a high degree of differentiation of education;
- Conduct classes at a high aesthetic and emotional level;
- Improve knowledge control;
- To increase the amount of work performed in class;
- Increase the effectiveness of the lesson;
- Provide access to electronic libraries, various reference systems, and other information sources (Bonch-Bruievych & Nosenko, 2010).

Experiment.

With the possibility of quantitative and qualitative further analysis of the results, our study was based on an online survey. The respondents of the survey were those who obtained higher education.

The results of the theoretical analysis show that the problem of using digital interactive projection media systems in the teaching of vocational subjects requires a deeper study due to insufficient study.



With the possibility of quantitative and qualitative further analysis of the results, our study was based on an online survey. Respondents of the survey were those with higher education (127 respondents).

To check the effectiveness of the use of digital interactive projection media systems in higher schools in teaching vocational subjects, a pedagogical experiment was conducted in the real conditions of the educational process.

Preparation for the experiment involved solving the following tasks:

- Provision of equal initial conditions for the control and experimental groups (training of teachers, success results, number of students);
- Development and selection of diagnostic methods;
- Determining the duration of the experiment;
- Definition of the levels at which we talk about changes in experimental groups.

The purpose of the experiment is to identify the level of readiness of students to use digital interactive projection media systems in educational and professional activities.

By students' readiness to use digital interactive projection media systems in educational and professional activities, we mean students' readiness to use digital interactive projection media systems, perception of information with their help during training, and readiness to implement them in their professional activities. Levels of students' readiness to use digital interactive projection media systems in educational and professional activities have been established:

High level – students who have a persistent need for further professional self-improvement and self-discovery; have a persistent and purposeful attitude to learning; have rich fantasy and imagination; have the skills and ability to operate information electronically; show a long-lasting interest in learning with the use of digital interactive projection media systems, a creative attitude with the use of innovative technologies to the organization of the educational process; actively perceive information in electronic form; show creative approaches to the development of classes with elements of digital interactive projection media systems; can independently use digital interactive projection media systems in educational and professional activities.

Intermediate level – students know the basics of digital interactive projection media systems in educational and professional activities; can select and analyze interactive products; are aware of the need to use them in professional activities; show an episodic interest in the application of digital interactive projection media systems in educational and professional activities, apply innovative teaching methods according to the proposed scheme, without showing creative approaches.

Low level – inherent in students with user-level knowledge of digital interactive projection media systems, who are not able to independently work with this product, analyze and select educational material; show weak initiative in learning, do not show interest in classes using digital interactive projection media systems in educational and professional activities; learning is of a copying nature, knowledge, skills, and developed skills are applied when solving the same type of tasks; cannot perceive educational information in electronic form, students lack creative imagination.

The analysis of the criteria for students' readiness to use digital interactive projection media systems in educational and professional activities after and before the formative experiment proved that after the implementation of the courses developed by us for the use of digital interactive projection media systems in educational and professional activities of future specialists, where students had the opportunity to develop their works with the use of digital interactive projection media systems in educational and professional activities, presented them to the group during the study of vocational subjects, the quantitative indicators of the levels in the experimental group increased significantly, while in the control group, the changes were not significant.



In particular:

The formation of the personal and motivational attitude of students to the use of digital interactive projection media systems in mastering professional subjects and professional activities has increased:

- By 41.7% in the experimental groups,
- By 8.9% in control groups;

The formation of general awareness of the use of digital interactive projection media systems has increased:

- By 57% in experimental groups;
- By 5.1% in control groups;

The formation of literacy in the use of digital interactive projection media systems has increased:

- By 48.6% in the experimental groups,
- By 9.9% in control groups.

After the formative experiment, the levels of readiness of the students of the control group and the experimental group regarding the use of digital interactive projection media systems in educational and professional activities were as follows:

EG readiness levels (in %):

- Low 23.5%;
- Average 52.7%;
- High 23.8%.

CG readiness levels (in %):

- Low 51%;
- Average 36.4%;
- High 12.6%.

Therefore, the introduction of digital interactive projection media systems in the teaching of vocational subjects in experimental groups, as well as the introduction of the course "Application of digital interactive projection media systems in the teaching of vocational subjects" contributed to the creation of a positive mood in the class, diversification of forms of educational activity, formation of skills in students and new skill.

As a result of the study, the students of the experimental groups showed better results in terms of the formed readiness to use digital interactive projection media systems in educational and professional activities than the students of the control groups, which indicates an improvement in the results of the assimilation of the educational material by students, which was studied with the help of the use of digital interactive projection media systems, as well as that, that the implementation of the proposed course "Application of digital interactive projection media systems in the teaching of vocational subjects" with the use of innovative methods contributed to increasing the level of students' readiness to use digital interactive projection media systems in professional activities. This contributed to the formation of the creative personality of a specialist who needs further professional self-improvement, a persistent need for self-knowledge, an innovative attitude to the organization of the educational process using digital interactive



projection media systems, a rich creative imagination that can apply the acquired innovative knowledge in his professional activity.

A sign criterion was used to identify the level of formation of the application of digital interactive projection media systems.

In the study, we used the Student's t-test.

The results of the experiment make it possible to conclude that the introduction of the course "Application of digital interactive projection media systems in the teaching of professional subjects" in the training of future specialists contributed to increasing the level of students' readiness to use digital interactive projection media systems in professional activities. Students mastered the stages of using digital interactive projection media systems, learned to organize their study time in working with digital interactive projection media systems, acquired skills and abilities to operate innovative information in electronic form, and used digital interactive projection media systems in independent educational and cognitive activities.

Conclusions

The content of the interactive education process and its components are disclosed. The essence and significance of digital interactive projection media systems in teaching professional subjects are shown. As an example of digital interactive projection systems, an effective interactive software-technological complex based on SMART Board is shown, the interactive functions of the interactive SMART Board software created specifically for the educational space in teaching vocational subjects and the advantages of the interactive panel in the educational space of a higher school are revealed. Ways of developing the teacher's professional competencies when using an interactive panel or blackboard in classes at a higher school are analyzed.

The effectiveness of electronic textbooks, manuals electronic educational and methodological complexes, informative and reference multimedia publications, game educational and developmental publications, scientific research STEM centers, multimedia classes, virtual laboratories, virtual classes, etc. in teaching vocational subjects is shown.

To check the effectiveness of the use of digital interactive projection media systems in higher schools in teaching vocational subjects, a pedagogical experiment was conducted in the real conditions of the educational process.

The purpose of the experiment is to identify the level of readiness of students to use digital interactive projection media systems in educational and professional activities.

Levels of students' readiness to use digital interactive projection media systems in educational and professional activities have been established:

As a result of the study, the students of the experimental groups showed better results in terms of the formed readiness to use digital interactive projection media systems in educational and professional activities than the students of the control groups, which indicates an improvement in the results of the assimilation of the educational material by students, which was studied with the help of the use of digital interactive projection media systems, as well as that, that the implementation of the proposed course "Application of digital interactive projection media systems in the teaching of vocational subjects" with the use of innovative methods contributed to increasing the level of students' readiness to use digital interactive projection media systems in professional activities. Students mastered the stages of using digital interactive projection media systems, learned to organize their study time in working with digital interactive projection media systems, acquired skills and abilities to operate innovative information in electronic form, and used digital interactive projection media systems in independent educational and cognitive activities.



Further research is needed to clarify the ways of using online platforms, interactive textbooks, mobile applications, social networks, QR codes, the project method, and cooperative "inverted" learning, which is important in modern higher education.

Bibliographic References

- Bonch-Bruievych, H. F., & Nosenko, T. I. (2010). *SMART Board interactive complex in the educational process: study guide*. Kyiv: Kyiv University named after B. Hrinchenko. https://elibrary.kubg.edu.ua/id/eprint/7919/1/Bonch_Nosenko_IKSBNP.pdf
- Budnyk, O., Rembierz, M., Arbeláez-Encarnación, T. F., Rojas-Bahamón, M. J., Arbeláez-Campillo, D. F., Chinchoy, A., & Matveieva, N. (2022). Formation of tolerance in the inclusive environment of an educational institution. *Amazonia Investiga*, 11(56), 305-319. <https://doi.org/10.34069/AI/2022.56.08.29>
- Bykov, V. Yu. (2008). *Models of organizational systems of open education: monograph*. Kyiv: Atika. <https://core.ac.uk/download/pdf/11084479.pdf>
- Dzhurynskyi, P., Broiakovskyi, O., Tsviak, O., Koshliak, M., Turchak, A., & Zalizniak, A. (2023). Innovative dimension of effectiveness in physical education student learning. *Amazonia Investiga*, 12(72), 167-179. <https://doi.org/10.34069/AI/2023.72.12.15>
- Hevko, I. V. (2018). Use of interactive technologies in education. *Collection of Scientific Works*, 139, 53-60. <https://enpui.npu.edu.ua/bitstream/handle/123456789/24374/Hevko.pdf?sequence=1>
- Hrytsenko, A. (2023). Opportunities of the information and educational environment in historical education. In *Actual problems of theory and methods of teaching history: Materials of the All-Ukrainian Scientific and Practical Conference* (pp. 216-221). Zaporizhia: Zaporizhia National University. https://sites.znu.edu.ua/interactiv.edu.lab/Conference/aktual__n__problemi_tm_n__.pdf
- Knysh, I., Budanova, O., Vakulenko, S., Syrotina, O., & Popychenko, S. (2023). Innovative educational technologies as a way of higher education enhancement. *Amazonia Investiga*, 12(68), 21-32. <https://doi.org/10.34069/AI/2023.68.08.2>
- Kozmenko, O., Popovych, I., Arbeláez-Campillo, D.F., Rojas-Bahamón, M.J., & Volchenko, L. (2022). Structural and functional model of the successful person training in USA colleges and universities. *Amazonia Investiga*, 11(55), 143-155. <https://doi.org/10.34069/AI/2022.55.07.15>
- Kuchai, O., Hrechanyk, N., Pluhina, A., Chychuk, A., Biriuk, L., & Shevchuk I. (2022). World Experience in the Use of Multimedia Technologies and the Formation of Information Culture of the Future Primary School Teacher. *International Journal of Computer Science and Network Security*, 22(3), 760-768. <https://acortar.link/GzXUdb>
- Kuchai, O., Kuchai, T., & Pyrzyk, I. (2017). Studying the peculiarities of education development in Japan (in terms of primary education). *Science and Education*, 25(5), <https://doi.org/10.24195/2414-4665-2017-5-7>
- Lishchynska, L. B. (2018). Features and perspectives of development of interactive educational space HEI. In *Interactive educational space of HEI* (pp. 21-23). Vinnytsia: VTEI KNTEU. <https://ir.lib.vntu.edu.ua/bitstream/handle/123456789/31577/71035.pdf?sequence=2&isAllowed=y>
- Lytvynova, S. H. (2011). Virtual classroom for organizing individual education of students. *Information Technologies and Learning Tools*, 1(21). <https://lib.iitta.gov.ua/id/eprint/196/1/statija-3.pdf>
- Marrero-Sánchez, O., & Vergara-Romero, A. (2023). Digital competence of the university student. A systematic and bibliographic update. *Amazonia Investiga*, 12(67), 9-18. <https://doi.org/10.34069/AI/2023.67.07.1>
- Matsiuk, V. M., & Pryimak, I. M. (2022). Mobile technologies as a means of learning in physics classes. In *Training future teachers of physics, chemistry, biology, and natural sciences in the context of the requirements of the New Ukrainian School* (p. 221–223). Ternopil: TNPU named after Volodymyr Hnatyuk. <http://physicsnature.tnpu.edu.ua/article/232/>
- Nikolenko, K., Korneiko, Yu., & Dobrostan, O. (2023). Interactive technologies and their application in mobile learning: Differences, challenges, and advantages. *Academic Visions*, (26), 1-13. <https://academy-vision.org/index.php/av/article/view/790>



- Plakhotnik, O., Zlatnikov, V., Strazhnikova, I., Bidyuk, N., Shkodyn, A., & Kuchai, O. (2023). Use of information technologies for quality training of future specialists. *Amazonia Investiga*, 12(65), 49-58. <https://doi.org/10.34069/AI/2023.65.05.5>
- Rojas-Bahamón, M. J., & Arbeláez-Campillo, D. F. (2023). Transforming editorial and peer review processes for a digital age. *Amazonia Investiga*, 12(61), 7-9. <https://doi.org/10.34069/AI/2023.61.01.0>
- Shakun, N., Zivenko, O., & Salnyk, I. (2023). Use of interactive technologies in STEAM education: advantages and challenges. *Herald of Science and Education*, 6(12), 646-656. [https://doi.org/10.52058/2786-6165-2023-6\(12\)-646-656](https://doi.org/10.52058/2786-6165-2023-6(12)-646-656)
- Shevchuk, P., & Fenrich, P. (2005). *Interactive learning methods: education manual*. Szczecin: WSAP Publishing House. https://nmc-pto.rv.ua/DOK/IMN_2005.pdf
- Spirin, O. M. (2021). Digitization of education, the educational process. In *Encyclopaedia of Education* (pp. 1099–1100). Kyiv: Yurinkom Inter. <https://lib.iitta.gov.ua/id/eprint/730769/1/Цифровізація%20освіти%20Освітнього%20процесу%20ОСніпін%20ЕБ.pdf>
- Sulym, V., Melnykov, A., Popov, M., Vechirko, O., & Malets, D. (2023). Improving education through implementation of information technologies into the educational process. *Amazonia Investiga*, 12(68), 281-293. <https://doi.org/10.34069/AI/2023.68.08.26>
- Tolochko, S., Bordiug N., Mironets, L., Mozul, I., & Tanasiichuk, I. (2023). Forming ecological culture in educational applicants within the context of modern education. *Amazonia Investiga*, 12(61), 41-50. <https://doi.org/10.34069/AI/2023.61.01.5>
- Truskavetska, I. Ya. (2023). Mobile learning as an effective tool for the professional training of future teachers of biology and the basics of health. *Scientific Innovations and Advanced Technologies*, 10(24), 732-739. [https://doi.org/10.52058/2786-5274-2023-10\(24\)-732-739](https://doi.org/10.52058/2786-5274-2023-10(24)-732-739)
- Tsiuniak, O. P., & Sultanova, L. Yu. (2021). Understanding the problem of professional training of future teachers of primary grades in the conditions of digital transformation of education. *Academic Studies. Series "Pedagogy*, 2(3), 208-214. <https://doi.org/10.52726/as.pedagogy/2021.3.2.31>
- Tsukanova, N., Kanosa, N., Hordiichuk, M., Popovych, O., & Kotelianets, N. (2023). The transformation of the training of preschool educators in the digital age. *Amazonia Investiga*, 12(72), 31-44. <https://doi.org/10.34069/AI/2023.72.12.3>
- Vykhrystiuk, M., & Salnyk, I. (2022). Introduction of mobile learning technologies. *Scientific Notes of Young Scientists*, 10. <https://phm.cuspu.edu.ua/ojs/index.php/SNYS/article/view/1977>
- Zinoruk, A. V. (2022). Theoretical aspects of interactive technologies. *International Scientific Journal "Grail of Science"*, (12–13), 589-591. <https://doi.org/10.36074/grail-of-science.29.04.2022.101>



DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.9>


Cómo citar:

Polyezhayev, Y., Terletska, L., Kulichenko, A., Vorobiova, L., & Snizhko, N. (2024). The role of web applications in the development of multilingual competence in CLIL courses in higher education. *Revista Eduweb*, 18(3), 106-118. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.9>

The role of web applications in the development of multilingual competence in CLIL courses in higher education

El papel de las aplicaciones web en el desarrollo de la competencia multilingüe en los cursos AICLE de la enseñanza superior

Yuriy Polyezhayev


 <https://orcid.org/0000-0001-9160-6945>

Researcher ID: AAB-8170-2020

yuriy.brikrio@gmail.com

Candidate of Sciences in Social Communications, Associate Professor, Department of Foreign Philology and Translation, Faculty of Humanities, National University "Zaporizhzhia Polytechnic", Zaporizhzhia, Ukraine.

Liubov Terletska


 <https://orcid.org/0000-0002-3690-5691>

Researcher ID: AAZ-1809-2021

terletskalm@ukr.net

PhD in Pedagogy, Senior Lecturer, Department of Foreign Languages and Methodology, Faculty of Pedagogical Education, Borys Grinchenko Kyiv University, Kyiv, Ukraine.

Alla Kulichenko


 <https://orcid.org/0000-0003-1469-3816>

Researcher ID: AAA-1386-2019

alla.kulichenko@gmail.com

Doctor of Pedagogical Sciences, Professor, Department of Foreign Languages, Zaporizhzhia State Medical and Pharmaceutical University, Zaporizhzhia, Ukraine.

Lolita Vorobiova


 <https://orcid.org/0000-0002-1001-1016>

Researcher ID: KRR-1467-2024

lolitalolita@ukr.net

PhD in Education, Senior Lecturer, Department of Foreign Philology, Ukrainian Studies and Social and Legal Disciplines, Donetsk National University of Economics and Trade named after Mykhailo Tuhun-Baranovskyi, Kryvyi Rih, Ukraine.

Nataliia Snizhko

 <https://orcid.org/0000-0003-4547-5934>

Researcher ID: AAE-4494-2019

snizhko.nataliia@gmail.com

Candidate of Sciences (Physics and Mathematics), Associate Professor, Department of Mathematics, National University "Zaporizhzhia Polytechnic", Zaporizhzhia, Ukraine.

Recibido: 24/06/24

Aceptado: 15/09/24

Abstract

The purpose of the work is to determine the role of web technologies to ensure the formation of multilingual



competence within the CLIL approach. For this purpose, a survey was conducted among students of various specialties, however, with a special emphasis on students of technical universities. The survey was conducted among 58 students. Questionnaires were used, including questions about the use of web applications in various forms of education. The results of the survey showed the high efficiency of using web applications in CLIL courses for the formation of both language competence and subject knowledge. The CLIL method combined with modern web applications proved to be an effective tool in the students' learning process. The implementation of the program of this approach allows not only the problem of educational overload, but also the strengthening of the general development of students, including their language skills. In the conclusions, it is noted that for the successful implementation of the CLIL program, it is necessary to provide students with essential terms and to acquire a foreign language and the availability of trained teaching staff.

Key words: digital learning, language competence, content-language integrated learning, pedagogical technologies.

Resumen

El objetivo del trabajo es determinar el papel de las tecnologías web para garantizar la formación de la competencia multilingüe dentro del enfoque AICLE. Para ello, se realizó una encuesta entre estudiantes de diversas especialidades, aunque con especial énfasis en los estudiantes de universidades técnicas. La encuesta se realizó entre 58 estudiantes. Se utilizaron cuestionarios que incluían preguntas sobre el uso de aplicaciones web en diversas formas de enseñanza. Los resultados de la encuesta mostraron la gran eficacia del uso de aplicaciones web en los cursos AICLE para la formación tanto de la competencia lingüística como del conocimiento de las materias. El método AICLE combinado con modernas aplicaciones web demostró ser una herramienta eficaz en el proceso de aprendizaje de los alumnos. La aplicación del programa de este enfoque permite no sólo resolver el problema de la sobrecarga educativa, sino también reforzar el desarrollo general de los alumnos, incluidas sus competencias lingüísticas. En las conclusiones, se señala que para el éxito de la aplicación del programa AICLE, es necesario proporcionar a los estudiantes con términos esenciales y adquirir una lengua extranjera y la disponibilidad de personal docente capacitado.

Palabras clave: aprendizaje digital, competencia lingüística, aprendizaje integrado de contenidos y lenguas, tecnologías pedagógicas.

Introduction

According to the globalization trends present in modern education, multilingual competence is becoming an increasingly chief skill for students. A central part of developing these skills is the use of Content and Language Integrated Learning (CLIL), which is created to provide the opportunity to study some academic disciplines and a foreign language. For this reason, their future competitiveness in the labour market is significantly enhanced. At the same time, technologies, in particular web applications, play a particularly important role in supporting and improving CLIL courses. Various web technologies play an important role in the CLIL methodology: they provide the formation of an interactive environment for the purpose of learning content in different languages. In addition, the active use of web applications in the CLIL system helps students actively develop in the educational process, master subject knowledge and develop language. This becomes especially important for the development of multilingual competences, because various web applications offer access to authentic resources and interactive tasks.

Modern scholars who have studied various manifestations of the use of digital technologies have generally emphasized their importance in the e-learning system, recognizing their accessibility and flexibility (Iastremska et al., 2023; Byrko et al., 2022). Besides, several modern works have proved that web-based applications provide an interactive and engaging learning environment where students can immerse themselves in a technology-based language environment (Stepanenko et al., 2022; Zaitsev, 2023). They can also actively interact with teachers and collaborate on projects with their classmates. They also allow



for personalization of the learning process, taking into account the individual needs and level of knowledge of each student (Papaja, 2024). Thus, the research problem consists in determining the effectiveness of using web applications in the CLIL methodology for the purpose of developing students' multilingual competences. Moreover, the importance of web-based applications in the process of developing multilingual competence in CLIL courses in higher education is extremely important, as they contribute to the effectiveness of learning and students' readiness for the challenges of the modern multilingual world.

The purpose of this research paper is to describe the importance of web-based applications in the process of developing multilingual competence in CLIL courses in higher education. The main objectives of the study are:

1. To identify the main methods of implementing CLIL for the development of multilingual competence.
2. To characterize the main web applications and the frequency of their use in the CLIL approach.
3. To determine the impact of web applications on the formation of language skills.
4. To describe the advantages and disadvantages of using web technologies for multilingual competence development.

The content of this article consists of an introduction that presents the research problem, a theoretical framework that reviews the scientific literature and shows the scientific novelty of this study, a methodology that involved the use of a quantitative approach, and the processing of survey data. 57 students completed the survey. Also, the work consists of the results, where the role of web technologies in the system of formation of multifaceted competence is investigated using the analysis of data from surveys, a discussion where the obtained results and conclusions are compared, which emphasize the critically important role of modern interactive technologies in the system of CLIL courses.

Theoretical Framework or Literature Review

Modern integration and globalization processes prevailing in Europe and the world have led to the actualization of the issue of information exchange, search for understanding among representatives of different ethnic groups and cultures, but also led to an understanding of the importance of preserving, conserving and developing the existing linguistic and cultural heritage and cultural diversity of peoples. Researchers believe that the concept of multilingualism has a rather vague definition, which can change in accordance with the existing realities in different scientific schools (Zaitsev, 2023). In the scientific linguistic literature, where the term "multilingualism" is used, the concepts of "multilingualism" and "polylingualism" are also used simultaneously (Smala, 2022; Jiang & Leung, 2024). Establishing similarities and differences between these terms is a process that is the subject of further important debates, which, in turn, also introduce ambiguity into the interpretation of the essence of "multilingualism". According to the literature analysis, it can be determined that multilingualism is the process of using several languages in the environments of certain social communities (primarily within the borders of a country); the use of several languages by an individual (or a group of subjects), each of which can be chosen in accordance with the requirements and needs of each specific communication case.

The development of multilingual competence (the ability to master foreign languages independently) in the higher education environment thus becomes an important element of higher education, so the attention to this issue, as characterized by researchers, is indeed very high (Byrko et al., 2022; Frumkina et al., 2020; Snizhko, 2023). Among the basic principles of the formation of a modern higher education institution, the role of digitalization in the educational process is rightly noted (Khoiriyah, 2021; Phuong & Thi Nguyen, 2022). This opens up new elements of foreign language teaching and multilingual competence, which makes it possible to reassess the existing ones and introduce new educational elements.

The creation of new information and educational environments on the Internet also makes it possible to fulfill one of the important principles of education democratization - to provide access to quality linguistic education to everyone, regardless of their place of residence, other objective circumstances, etc. In



general, students should not only have an adequate level of knowledge in learning a foreign language, but also form reliable levels of competence necessary for the subsequent use of the acquired knowledge, their independent development during further education or professional activities.

The previous review of the CLIL literature generally focuses on general strategies for using language to support and process information, improve the quality of learning, and form an appropriate level of multilingual competence (Turchyn et al., 2023; Compagnoni, 2023; Hemmi & Banegas, 2021). In particular, an extended review of measures to support different strategic approaches to quality content for reading, teaching, etc. was proposed (Geoghegan, 2024). Researchers have also paid a lot of attention to strategies and methods for integrating practical recommendations to support language use across the curriculum, which is especially relevant for CLIL, using basic tools to formulate clear learning objectives (Hubina, 2017; Shevchenko & Dubiaha, 2022). The CLIL research literature also demonstrates a wide range of other strategies to support language learning, including the use of various cognitive strategies, research approaches with the use of game opportunities (Gierlinger, 2017), communication and active listening, the use of special methods for vocabulary building, participation in cultural, international and cross-curricular learning activities, etc. These approaches emphasize the innovative nature of CLIL and the methodological stimulus provided by the use of such a methodology. However, the proposed studies do not fully reveal the possibilities of pedagogical ways to help teachers and students develop and use different types of conversation, nor do they address the different linguistic cultures of different academic subjects.

Methodology

The study uses quantitative data processing methods. In particular, the features of CLIL use in higher education were assessed through a survey. The main participants of the study are students of different specialties who took part in an anonymous survey.

Sample and Participants

Students were selected for the experiment using a purposive sampling method. In total, 57 students were selected from different faculties. Participation in the survey was voluntary and based on the criterion of familiarization with the use of CLIL in higher education. All students have different experience of using web technologies in the learning process: from initial (who have just started using them) to advanced (who have been using CLIL web technologies for more than one semester). The study involved students based on the soft, language-led approach - the development of linguistic skills within a specific context (see Table 1).

Table 1.
Data of respondents

Indecator	N	%
Specialty		
Humanities	14	24,56%
Natural sciences	5	8,77%
Technical sciences	21	36,84%
Economics and management	17	29,82%
Level of education		
Bachelor (first and second year)	21	36,84%
Bachelor's degree (third and fourth years)	23	39,66%
Master's degree	14	24,56%
The level of technology use		
Beginners	17	29,82%
The average level	22	38,60%
Experienced users	18	31,58%

Source: Author's development



This demographic data shows the diversity of respondents and their different experiences with web applications. The majority of respondents were from technical fields. This is due to the fact that teaching subjects using the methodology is becoming increasingly popular in technical universities, especially for engineering majors.

Data collection

In order to collect data as part of the study of the peculiarities of using web applications in CLIL courses among students of different specialties, a survey was used as the main tool for collecting information. The main stages of data collection consisted of developing a questionnaire based on a preliminary analysis of the literature that examined the key features of using technology in education. The structure of the questionnaire itself included sections on collecting demographic characteristics, questions about the specifics of using individual web applications in CLIL courses, and outlining feedback on the advantages and disadvantages of using this approach (see Table 2).

Table 2.
Questionnaire

Questions	Answer options
Demographic data	What is your specialization? What course are you studying in? How old are you?
What web applications do your teachers use in CLIL?	Educational Google Meet Zoom Microsoft Teams Organizational and methodical Google Classroom Moodle Additional Quizlet Kahoot Padlet Trello Slack
How often do you use web applications in CLIL?	a. Every day b. Once a month c. 2-3 times a week d. 2-3 times a month
For what specific types of learning are web applications used in your institution?	a. Seminars b. Lectures c. Group projects d. Individual classes
Rate the value of individual applications for the development of your language skills (1 - negative, 5 - positive)	a. 1 b. 2 c. 3 d. 4 e. 5
Evaluate the impact of applications on understanding the subject	a. 1 b. 2 c. 3 d. 4 e. 5
Evaluate the impact of applications on learning motivation	a. 1 b. 2 c. 3



	d. 4 e. 5
What do you consider to be the best aspects of using web applications?	a. Accessibility b. Interactivity c. Convenience d. Realization of digital collaboration e. Other
What are the challenges of using web applications?	a. Technical issues b. Problems with the Internet c. Low motivation in the digital environment d. Lack of support from teachers e. Other

Source: Author' development

Certain aspects of the survey included its distribution among potential participants through the electronic systems of the educational institution (in particular, via e-mail and separate learning platforms). Students' responses were also collected within a certain period of time (February 15, 2024 - February 25, 2024), i.e. within 10 days. All survey participants are guaranteed anonymity and confidentiality of their data.

Data analysis

Data processing consisted of checking respondents' answers for completeness. After that, the answers were coded and categorized. In particular, using Excel, the main questions and their answers were entered into tables. Thus, the most common themes, advantages and problems of using web technologies in the CLIL system were found. An important method was statistical analysis, which was used to identify and define the main answers, dependencies and statistically significant differences between different groups of students. The results of the study are presented in such a way as to describe first some features of the CLIL approach, the frequency of technologies, advantages and main disadvantages of implementing web applications.

Results and Discussion

The CLIL approach is aimed at teaching a foreign language to students while they acquire specialized knowledge from the curriculum. One of the advantages of the CLIL method is that it allows you to mix one or more elements of the curriculum, which helps to solve the problem of an "overcrowded curriculum". But before putting CLIL programs into practice, there are a few key things to think about. These include: 1) the availability of trained teaching staff; 2) the requirement for cooperation between teachers of different disciplines; 3) providing students with essential terms and concepts in a foreign language; 4) the potential for changes in schedules necessary to implement a CLIL program (including the period devoted to curriculum planning).

There are several methods of incorporating CLIL into the educational process. The plot technique is predicated on fusing students' thoughts and passions with the scheduled learning topic. Students contribute to the telling of a particular tale by answering "prompts" (also known as key questions) that the teacher gives them. This approach, which incorporates innovative organizing, hypothesis selection, experience, rationalization, and work display, does not rely on textbook. The planned narrative also incorporates role-playing and dramatic components. Additionally, students research and ask inquiries to one another.

The simulation approach is used in classroom instruction through a variety of simulations that let students hone their abilities and use their expertise to figure out problems in a setting that mimics actual ones. Students might try themselves in various roles through modeling. Students have the capacity to plan strategically, collaborate with others, bargain, and convince thanks to the scenario. An easy technique for rapidly and subconsciously recording ideas, discussions, and ideas is the "Mind-Map" technique. A mind



map is a visual aid that can be used to depict a word, idea, task, picture, or other related items grouped around a main term or notion. There are three kinds of absorption in a foreign language. With the exception of conducting the instruction in a foreign language without any "discounts" based on the students' proficiency level, full immersion in a foreign language is a usual educational session in professional fields. This implies that a high level of IM competency is required of students who study certain disciplines using the full immersion technique in a foreign language.

After processing the demographic data, it was established that the majority of respondents used technologies in the CLIL course system when studying technical and economic sciences (36.84% and 28.82%, respectively). At the same time, the majority of respondents were familiar with technologies starting from the first bachelor's academic year (36.84%). These technologies are also widespread (24.56%) at the master's level. Table 3 provides more detailed demographic information about the participants.

Table 3.
Data of respondents

Indecator	N	%
Specialty		
Humanities	14	24,56%
Natural sciences	5	8,77%
Technical sciences	21	36,84%
Economics and management	17	29,82%
Level of education		
Bachelor (first and second year)	21	36,84%
Bachelor's degree (third and fourth years)	23	39,66%
Master's degree	14	24,56%
The level of technology use		
Beginners	17	29,82%
The average level	22	38,60%
Experienced users	18	31,58%
Age		
18-21 years	21	36,84%
21-23 years	23	39,66%
23-25 years	14	

Source: Author' development

In the CLIL system, an important role is played by the use of various web technologies that facilitate immersion in a foreign language environment. Among them, both learning platforms and individual applications aimed at creating assignments, tests and monitoring classes play an important role. Respondents indicated that among the learning platforms they mainly use Zoom (35), Microsoft Teams (13), and Google Meet (10). LMSs that facilitate the organization and control of learning are mainly used by Moodle (49) and Google Classroom (9). The use of various additional web-based technologies plays an important role in the CLIL-based learning management system, in particular, tools that facilitate interactive presentation of material and implementation of testing and control. In particular, an important application is Padlet, which is aimed at creating collaborative boards (12) and Trello (11), which acts as a service for organizing projects and tasks in the form of cards. Also important are applications aimed at creating interactive tasks and quizzes (Kahoot, Quizlet, and Slack). Table 4 shows in detail the respondents' answers about the main web applications used by teachers in CLIL courses.

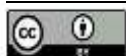


Table 4.
Main web applications in the CLIL system

Web Applications	N	%
Educational platforms		
Zoom	35	60,34%
Microsoft Teams	13	22,41%
Google Meet	10	17,24%
LMS		
Moodle	49	84,48%
Classroom	9	15,52%
Additional Applications		
Padlet	12	20,69%
Trello	11	18,97%
Kahoot	7	12,07%
Quizlet	9	15,52%
Slack	11	18,97%

Source: Author's development

Table 4 shows a variety of applications used by teachers to develop the multilingual competence of modern students. Despite this, the frequency of their use is mostly every day (23) or 2-3 times a week (26). This indicates that teachers actively use these applications based on interactive multimedia technologies, which not only improves language competence but also ensures that students are more motivated and interested in learning (see Table 5).

Table 5.
Frequency of using web technologies in the CLIL system

Frequency	N	%
Every day	23	39,66%
2-3 times a week	26	44,83%
2-3 times a month	7	12,07%
Once a month	2	3,45%

Source: Author's development

Besides, given the demographic data of the participants, teaching subjects using the CLIL methodology is becoming increasingly popular in technical universities, especially for engineering specialties. In terms of implementing this approach in the system of technical universities, CLIL has a number of features and advantages. In particular, engineering courses often contain a lot of specialized terminology. Teaching such courses in a foreign language helps students to master professional vocabulary, which is extremely important for their future careers, especially in international companies. Laboratory and practical classes are also an important part of engineering education. For this reason, teaching such classes in a foreign language helps students not only to understand the material, but also to learn how to describe processes, experiment results, and draw conclusions in the language used in the international scientific and engineering community.

In the CLIL system, modern web applications are used to conduct various types of training, lectures, seminars, group or individual projects, assignments to monitor results and for testing purposes. In particular, 25 answers mentioned lectures, 31 and 35 answers mentioned seminars and group classes, respectively. Another 26 indicated individual classes and seminars, respectively. The largest number of responses (43) indicated the use of these applications for interactive control tasks. Completing various learning projects and preparing presentations in a foreign language develops students' communication skills, teamwork skills, and ability to succeed in an international digital environment (See Table 6).



Table 6.
Types of educational activities

Types of educational activities	N	%
Lectures	25	43,10%
Seminars	31	53,45%
Group projects	35	60,34%
Individual classes	26	44,83%
Testing	43	74,14%

Source: Author's development.

Besides, the use of web-based applications is important for the development of language skills. Modern platforms are designed in such a way that they can develop both speaking and writing skills through activities aimed at listening, communication, grammar and vocabulary development. Students recognized that there is a connection between the use of modern web applications and the development of language skills. The majority of respondents rated this impact at 4 and 5 points on the Likert scale (34.48% and 55.17%, respectively). It was also determined that web applications also affect the understanding of the subject (5 points - 10 students or 17.24%, 4 points - 39 students or 67.24%, and 3 points - 10 people or 13.79%) and increase motivation to learn (5 points - 32 students - 55.17%, 4 points - 14 students - 24.14%, - 3 points - 11 - 18.97%), as evidenced by the respondents' scores (see Figure 1).

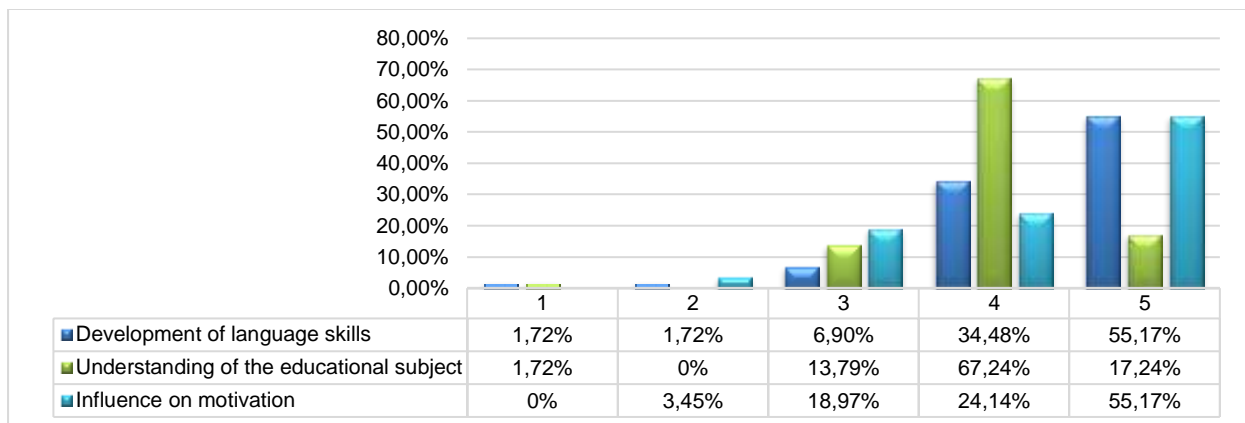


Figure 1. The impact of web technologies on the development of language skills, subject knowledge and motivation to learn.

Source: Author's development

The advantages of using web technologies in the development of multilingual competence are quite obvious. First of all, we are talking about the possibility of open access to all resources that serve as reliable tools for forming the necessary knowledge and achieving the desired learning goals. The aspects of convenience and accessibility were emphasized by 44.83% of respondents. Secondly, digital technologies regularly and continuously facilitate learning, improve language skills, communication and intellectual exchange. In addition, in addition to the purely pedagogical load, digital technologies have a powerful gaming segment for teaching, which is considered a powerful advantage in modern world pedagogical experience. The aspect of interactivity and the implementation of joint digital activities was emphasized by 39.66% and almost 16% of respondents.

Modern digital capabilities of technologies, such as augmented reality, allow visualizing educational content, showing video clips, animations, etc. Moreover, these functions can be performed using mobile applications, which make digitalization an even more accessible element of education. Given that the largest number of participants study at technical universities are majoring in engineering. Teaching various engineering disciplines in a foreign language helps to improve language competence, increase specific

labor marketability, and develop critical thinking. In particular, knowledge of foreign languages and specialized terminology makes graduates more attractive to international companies.

However, there are some challenges in creating a digitalized learning space using special web applications. In particular, technical issues (24.14%) and low motivation to learn in a digital environment (18.97%) are notable. However, the most common problem is the lack of the Internet access (48.28%). Also, 5 respondents emphasized that an important difficulty is the lack of effective support from teachers (8.62%). Thus, the use of web-based applications is effective in some aspects but requires support from both the training center (high level of technology) and the teacher (high level of pedagogical and linguistic competence).

The proposed results generally demonstrate the high efficiency of the use of digital tools in the integration of CLIL into the educational process in Ukrainian higher education institutions. The positive impact of digitalization (in particular, the use of applications) on the formation and development of multilingual competence was noted in the survey. The proposed results indicate that the use of Zoom, Microsoft Teams and Google Meet learning platforms is popular, which correlates with the findings of other researchers (Patiño-Santos & Poveda, 2022). Similarly, the proposed results determine that the use of various additional web technologies plays an important role in the system of organizing learning based on the CLIL approach. Similar conclusions were reached by other researchers who emphasized the relevance of modern applications as elements of learning and improving multilingual competence in CLIL courses (Popadynets & Staryk, 2022; Nawrot-Lis, 2021). Researchers have drawn attention to the problematic elements of using CLIL in teaching and developing relevant competencies. In particular, attention was drawn to the lack of motivation during learning and the lack of appropriate training among teachers, which slows down the further dynamic development of the use of digital technologies (Verikaitė-Gaigalienė & Andziulienė, 2019; Cinganotto, 2016; Denman et al., 2022; Pérez Cañado, 2018).

The proposed results allow us to argue with such conclusions. The point is that teachers, according to the survey, use various applications mostly every day or 2-3 times a week. On the one hand, this shows the frequency of digital technologies, and on the other hand, it indicates high skills of teachers in digital technologies (since without the appropriate skills, the use of the necessary applications is impossible). Therefore, the results are more in favor of other conclusions: the ease of use of digital technologies allows teachers to quickly learn new methods (Burns & García, 2024). Teachers are actively using these applications based on interactive multimedia technologies, which not only improves language competencies but also ensures that students are more motivated and interested in learning (Martínez Agudo, 2019). The results also demonstrate that the use of web-based applications contributes to the development of language skills. This confirms the findings of other researchers who have emphasized that modern digital platforms generally function as multidisciplinary elements, which allows for a comprehensive approach to learning and the formation of relevant multilingual competencies (San Isidro & Lasagabaster, 2020). In particular, a study and comparison with the Swedish experience of CLIL implementation also confirms this conclusion (Paulsrud, 2018). Undoubtedly, the further introduction of digital applications into the process of higher education in the field of foreign language acquisition is an objective requirement of our time (Rudenko & Kharkov, 2023). For this reason, further research will significantly expand the process of understanding the role of digitalization in the formation of multilingual competence.

The results of this study correlate with the study by Yevtushenko (2021), which characterizes the features of CLIL implementation in the system of training students of technical specialties. The researcher also drew attention to both the broad possibilities of this approach and some shortcomings. However, this study has shown that the main challenges are technical issues, problems with the Internet, and a low level of motivation to learn in a digital environment. In some cases, there is a lack of effective support from teachers. However, the study by Yevtushenko (2021) identified a number of other problems, including the experimental nature of some CLIL programs, the need for a high level of language competence of subject teachers, lack of qualified teacher training, etc. The authors of this article also agree with these problems, and moreover, a connection can be made between the lack of effective support from teachers (as



demonstrated in this study) and the lack of qualified teacher training for CLIL implementation (as demonstrated in Yevtushenko (2021)). The proposed methodology, however, has certain limitations. In particular, the survey demonstrates specific empirical results, but the peculiarities of using the Likert scale have a role in understanding the results. First of all, the difference between average, good, and poor on the Likert scale is quite subjective: what may be mediocre for one respondent is still close to a higher level (though not excellent) for another. In such circumstances, it is possible to correlate the statistical indicators of the study, to understand the results as certain markers rather than just a number. The Likert scale may not take into account the circumstances in which students work or study in higher education institutions, the level of material and technical resources, the level of teaching skills, or the level of knowledge of students. All of this may have a minor impact on the overall values of the empirical data. For comparison, we chose relevant English-language literature, which allowed us to discuss the proposed results qualitatively. The use of such a sample for scientific literature somewhat limits the use of foreign-language publications, which may also have rational thoughts on the development of CLIL in the context of digitalization of higher education. This factor makes it possible to determine that the issue will require further discussion with the involvement of a wider range of scientific literature, using new, improved criteria for selecting research texts.

Conclusions

Thus, in the CLIL didactic approach, modern web applications play an important role in the development of multilingual competence. They make learning more accessible, convenient and interactive for modern students. For technical specialties, this approach is especially important, as it develops knowledge of specific terminology that may not have analogues or equivalents in the student's native language and the skills to use it. The CLIL system actively uses modern web applications to conduct various types of training, such as lectures, seminars, group and individual projects, as well as to monitor results and conduct tests. One of the key advantages of the CLIL method is the ability to integrate several elements of the curriculum, which helps to solve the problem of an "overcrowded curriculum". Implementation of CLIL requires trained teaching staffs that have both subject knowledge and a high level of foreign language proficiency. This requires organizing special trainings for teachers.

Thus, the CLIL methodology is a promising direction, however, for its wider implementation it is necessary to follow the recommendations: 1. Increasing attention to teacher training, in particular, providing teachers with the necessary resources and training for effective teaching of CLIL; 2. Creating quality learning resources that meet the requirements for implementing this didactic approach; 3. Providing quality technical support, in particular, quality access to modern web applications that support the learning process.

Bibliographic References

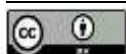
- Burns, L. V. F., & García, M. R. (2024). Preservice teachers' social projects for digitalized bilingual classrooms. In *Interdisciplinary Research and Innovation in Bilingual and Second Language Teacher Education* (pp. 90-119). Routledge. <https://doi.org/10.4324/9781003350217-8>
- Byrko, N., Tolchieva, H., Babiak, O., Zamsha, A., Fedorenko, O., & Adamiuk, N. (2022). Training of teachers for the implementation of universal design in educational activities. *AD ALTA: Journal of Interdisciplinary Research, Special Issue* 12, 117-125. https://www.magnanimitas.cz/ADALTA/120228/papers/A_22.pdf
- Cinganotto, L. (2016). CLIL in Italy: a general overview. *Latin American Journal of Content & Language Integrated Learning*, 9(2), 374-400. <https://doi.org/10.5294/laclil.2016.9.2.6>
- Compagnoni, I. (2023). The impact of a post-pandemic educational technology training on usability and acceptance by teachers of Italian as a foreign language. *Italiano LinguaDue*, 14(2). <https://doi.org/10.54103/2037-3597/19623>
- Denman, J., Schooten, E. V., & de Graaff, R. (2022). Inclusive CLIL. *AILA Review*, 35(2), 321-350. <https://doi.org/10.1075/aila.22020.den>



- Frumkina, A., Diachenko, M., Polyezhayev, Y., Savina, N., & Hadi, F. (2020). Readiness of future teachers for integrated teaching of educational subjects in foreign language. *Práxis Educacional*, 16(38), 502-514. <https://doi.org/10.22481/praxisedu.v16i38.6023>
- Geoghegan, L. (2024). Language learning motivation in multilingual CLIL. *Porta Linguarum Revista Interuniversitaria de Didáctica de las Lenguas Extranjeras*, (41), 137-151. <https://doi.org/10.30827/portalin.vi41.26620>
- Gierlinger, E. M. (2017). Teaching CLIL? *Journal of Immersion and Content-Based Language Education*, 5(2), 187-213. <https://doi.org/10.1075/jicb.5.2.02gie>
- Hemmi, C., & Banegas, D. L. (2021). CLIL: An Overview. In *International Perspectives on CLIL* (pp. 1–20). Springer International Publishing. https://doi.org/10.1007/978-3-030-70095-9_1
- Hubina, S. (2017). Teaching activities self regulation by means of art therapy. *Science and Education*, 11, 114-119. <http://scienceandeducation.pdpu.edu.ua/articles/2017-11-doc/2017-11-st15>
- lastremaska, O., Tryfonova, O., Mantaliuk, O., & Baranets, H. (2023). The impact of strategic decisions on the future development of organisations and economic dynamics. *Futurity Economics&Law*, 3(4), 117-134. <https://doi.org/10.57125/FEL.2023.12.25.08>
- Jiang, L., Li, Z., & Leung, J. S. C. (2024). Digital multimodal composing as translanguaging assessment in CLIL classrooms. *Learning and Instruction*, 92, 101900. <https://doi.org/10.1016/j.learninstruc.2024.101900>
- Khoiriyah, K. (2021). Content and Language Integrated Learning (CLIL) in Indonesian Context: an Overview. *Journal of Progressive Education*, 11(3), 587-601. <https://doi.org/10.23960/jpp.v11.i3.202110>
- Martínez Agudo, J. de. D. (2019). The impact of CLIL on English language competence in a monolingual context: a longitudinal perspective. *The Language Learning Journal*, 48(1), 36-47. <https://doi.org/10.1080/09571736.2019.1610030>
- Nawrot-Lis, B. (2021). Language in CLIL settings: research overview. *Linguistics*, 1(14), 223-235. https://doi.org/10.25312/2391-5137.14/2020_14bnl
- Papaja, K. (2024). Preliminary Material. In *A Reflective CLIL Teacher: A Way to Enrich the CLIL Teaching Professional Practice in the Polish Context*. BRILL. https://doi.org/10.1163/9789004548152_001
- Patiño-Santos, A., & Poveda, D. (2022). Bilingual education. In *Global CLIL* (pp. 149-173). Routledge. <https://doi.org/10.4324/9781003147374-9>
- Paulsrud, B. (2018). Mapping CLIL in Sweden. In L. K. Sylvén (Ed.), *Investigating Content and Language Integrated Learning* (pp. 19-34). Multilingual Matters. <https://doi.org/10.21832/9781788922425-005>
- Pérez Cañado, M. L. (2018). CLIL and Educational Level: A Longitudinal Study on the Impact of CLIL on Language Outcomes. *Porta Linguarum Revista Interuniversitaria de Didáctica de las Lenguas Extranjeras*, 29, 51-70. <https://doi.org/10.30827/digibug.54022>
- Phuong, Y. H., & Thi Nguyen, L. G. (2022). English Teachers' Questions in A Vietnamese High School Reading Classroom. *JEELS (Journal of English Education and Linguistics Studies)*, 4(2), 129-154. <https://doi.org/10.30762/jeels.v4i2.63>
- Popadynets, O., & Staryk, O. (2022). From English for specific purposes (ESP) to content and-language integrated learning (CLIL): to the problem of providing continuous foreign language education. *Humanities science current issues*, 3(47), 301-305. <https://doi.org/10.24919/2308-4863/47-3-49>
- Rudenko, O., & Kharkov, S. (2023). Philosophical studies of the future in the context of postmodern knowledge: theory, methodology. *Futurity Philosophy*, 2(3), 4-16. <https://doi.org/10.57125/FP.2023.09.30.01>
- San Isidro, X., & Lasagabaster, D. (2020). Students' and families' attitudes and motivations to language learning and CLIL: a longitudinal study. *The Language Learning Journal*, 50(1), 119-134. <https://doi.org/10.1080/09571736.2020.1724185>
- Shevchenko, Y., & Dubiaha, S. (2022). The impact of inclusive practices on academic performance in primary school. *AD ALTA: Journal of Interdisciplinary Research*, 12(2), 124-127. <http://eprints.mdpu.org.ua/id/eprint/12714/1/124-127.pdf>
- Smala, S. (2022). Situated emergence of CLIL. In *Global CLIL* (pp. 52–73). Routledge. <https://doi.org/10.4324/9781003147374-4>



- Snizhko, N. (2023) Implementation of bilingual education in Ukrainian institutions of higher education. *Viae Educationis: Studies of Education and Didactics*, 2(3), 35-39. https://cejsh.icm.edu.pl/cejsh/element/bwmeta1.element.ojs-doi-10_15804_ve_2023_03_04
- Stepanenko, O., Ohrimenko, Z., Shaforost, Y., Pasichnyk, L., & Pochynok, Y. (2022). Positive learning environment in educational sphere. *Revista Eduweb*, 16(2), 30-48. <https://doi.org/10.46502/issn.1856-7576/2022.16.02.2>
- Turchyn, I., Zaitseva, S., Rudenko, N., Saienko, V., Kuzemko, N., & Denefil, O. (2023). Using distance learning models as opportunities for blended learning for foreigners. *Romanian Magazine for Multidimensional Education*, 15(4), 178-191. <https://www.doi.org/10.18662/rrem/15.4/787>
- Verikaitė-Gaigalienė, D., & Andziulienė, L. (2019). To Be Or Not to Be: An Overview of Clil Implementation in Lithuania. *Sustainable Multilingualism*, 14(1), 123-135. <https://doi.org/10.2478/sm-2019-0006>
- Yevtushenko, N. (2021). Content-language integrated learning (clil) in the training of students of technical specialties. *Young Scientist*, 10.1(98.1), 45-48. <https://doi.org/10.32839/2304-5809/2021-98.1-11>
- Zaitsev, S. (2023). Using Digital Tools to Increase the Competitiveness of Small Businesses (Experience of Full-Service Bakeries). *Futurity of Social Sciences*, 1(4), 75-90. <https://doi.org/10.57125/FS.2023.12.20.05>



DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.10>

Cómo citar:

Chovriy, S., Vorona, V., Mahas, H., Tkachuk, D., Makhynia, N., & Kurchatova, A. (2024). Peer learning and peer assessment in institutions of higher education. *Revista Eduweb*, 18(3), 119-133. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.10>

Peer learning and peer assessment in institutions of higher education

Aprendizaje entre pares y evaluación entre pares en instituciones de educación superior

Sofiya Chovriy



<https://orcid.org/0000-0001-9271-004X>

WoS Researcher ID: JFK-9632-2023

csoori.zsofia@gmail.com

Candidate of Pedagogical Sciences, Associate Professor, Associate Professor at the Department of Pedagogy, Psychology, Primary, Pre-School Education and Management of Educational Institutions, Ferenc Rakoczi II Transcarpathian Hungarian College of Higher Education, Ukraine.

Vita Vorona



<https://orcid.org/0000-0003-4958-3019>

WoS Researcher ID: AAC-7939-2020

vitaplusik@ukr.net

Candidate of Sciences in Physical Education and Sports, Associate Professor, Associate Professor at the Department of Physical Education and Sports, Sumy State University, Ukraine.

Hennadii Mahas



<https://orcid.org/0000-0002-2769-9718>

WoS Researcher ID: KLY-5402-2024

magas-xm@ukr.net

Doctor of Science in Public Administration, Associate Professor, Deputy Head of the Border Security Department, Bohdan Khmelnytskyi National Academy of the State Border Guard Service of Ukraine, Ukraine.

Dmytro Tkachuk



<https://orcid.org/0009-0001-1127-5742>

WoS Researcher ID: KLZ-2087-2024

tdv30041102@gmail.com

Candidate of Pedagogical Science, Associate Professor at the Border Security Department, Bohdan Khmelnytskyi National Academy of the State Border Guard Service of Ukraine, Ukraine.

Nataliia Makhynia



<https://orcid.org/0000-0001-8641-6602>

WoS Researcher ID: AAM-5699-2021

n.makhynia@chdtu.edu.ua

Doctor of Science in Pedagogics, Professor, Dean of Humanitarian Technologies Department, Cherkasy State Technological University, Ukraine.

Anzhelika Kurchatova



<https://orcid.org/0000-0002-1282-837X>

WoS Researcher ID: ITF-5129-2023

kurchat67@gmail.com

Candidate of Pedagogical Sciences, Associate Professor, Dean of the Faculty of Natural Sciences, V. O. Sukhomlynskyi National University of Mykolaiv, Ukraine.

Recibido: 21/07/24

Aceptado: 18/09/24



Abstract

The article examines the types of control and the most important principles of evaluating the knowledge of higher education students; the advantages of the modular rating system for the organization of training and training in "peer-to-peer" or peering training conditions are shown; the basis of peer learning is considered and various definitions of peer assessment are proposed. The basis of peering interaction is Web 3.0 technologies, the Internet, a large number of open educational resources (OER), and mass digitization of various materials. Peer 2 Peer University (P2PU) is an example of peering interaction and its successful functioning system. The system of peering interaction using ICT is revealed and the possibilities for peering assessment, which are provided in the applications of research learning spaces, are shown. The features of peer evaluation and consideration of these features when developing evaluation criteria are described. Based on the results of the ascertainment experiment and the conclusions regarding the renewal and improvement of the educational sector, in general, and the evaluation of higher education applicants, in particular, a model of digital tools and methods of introducing peer evaluation into the educational process of higher education institutions was introduced into the educational process of higher education institutions.

Keywords: peer learning, peer assessment, higher education institutions, peer interaction, peer-to-peer.

Resumen

El artículo examina los tipos de control y los principios más importantes de la evaluación de conocimientos de los estudiantes de educación superior; se muestran las ventajas del sistema de calificación modular para la organización de la formación y la formación en condiciones de formación "peer-to-peer" o entre pares; Se consideran las bases del aprendizaje entre pares y se proponen varias definiciones de evaluación entre pares. La base de la interacción entre pares son las tecnologías Web 3.0, Internet, una gran cantidad de recursos educativos abiertos (REA) y la digitalización masiva de diversos materiales. Un ejemplo de interacción entre pares, cuyo sistema de funcionamiento exitoso es Peer 2 Peer University (P2PU). Se revela el sistema de interacción entre pares utilizando las TIC y se muestran las posibilidades de evaluación entre pares que se brindan en las aplicaciones de los espacios de aprendizaje en investigación. Se describen las características de la evaluación por pares y la consideración de estas características al desarrollar criterios de evaluación. A partir de los resultados del experimento de verificación y las conclusiones sobre la renovación y mejora del sector educativo, en general, y la evaluación de los solicitantes de educación superior, en particular, se presenta un modelo de herramientas y métodos digitales para introducir la evaluación entre pares en el proceso educativo. de las instituciones de educación superior se introdujo en el proceso educativo de las instituciones de educación superior.

Palabras clave: aprendizaje entre pares, evaluación entre pares, instituciones de educación superior, interacción entre pares, entre pares.

Introduction

The purpose of modern institutions of higher education is to teach students to learn and act in conditions of uncertainty, and not only to impart skills, knowledge, or certain skills. Innovative assessment is necessary to achieve the goal set by the teacher (Boiko, 2023).

It is increasingly common to see that the educational process cannot be modernized in the 21st century without considering changes aimed at global educational standards. Educational reforms that take on an international character go beyond the borders of one state. In the educational space of society, innovative technologies, in particular digital ones, are being introduced, which inevitably cause the need to improve and rethink pedagogical methods, that is, the emphasis is shifting towards personality development. Modern education, which is in the process of reconstruction and transformation, strives to meet international standards, adapts to the requirements of the labor market and modernity, and seeks new technologies and methods. The educational process is constantly searching for various tools to ensure



independent self-organization and research activities of students. With the emergence of a large number of mass open online courses and the introduction of distance and mixed learning, the innovative technology of peer learning, which includes peer assessment, is becoming more and more widespread (Morze & Buinytska, 2021).

An important means of increasing the efficiency of the educational process of a higher school is the creation of a stimulating system for the control of educational work for students of higher education. In an institution of higher education, training should be potentially oriented both to the high-quality professional training of future specialists by their specialization, and to the training of such specialists who have the skills and knowledge for effective innovative evaluation of the educational achievements of their subordinates (Maksymchuk et al., 2023). Therefore, peer evaluation in institutions of higher education is an important strategy that involves one person making decisions about the work of other people, which occurs when specialists work together on educational tasks or joint projects.

Despite the interest in peer learning and peer assessment in higher education institutions, it remains insufficiently studied, as it is mainly aimed at improving traditional approaches to the organization of education. Its solution becomes possible, in our opinion, thanks to the introduction of educational innovations, in particular, the development of technologies based on the use of mutual learning ideas in the process of mastering professional knowledge and skills, which will ensure the creation of a favorable atmosphere for all subjects of educational activity.

The development of peer learning and peer assessment in higher education institutions is currently an urgent issue of the theory and methodology of learning in the educational process. Based on this, we considered the following questions in the article:

- Types of control and the most important principles of knowledge assessment of higher education students.
- The modular rating system of the training organization.
- Education in "peer-to-peer" conditions, or peering education.
- System of peering interaction using ICT.
- Advantages of peer learning.
- Possibilities for peer assessment are provided in the exploratory learning spaces applications.
- Features of peer evaluation and consideration of these features when developing evaluation criteria.

Literature Review

We will analyze the achievements of scientists who focus their research on changes in the practice and theory of evaluating the educational achievements of students of higher education in the context of focusing on person-oriented learning, in particular the recognition of the formative function of evaluation when students of the educational space are involved in the development and use of evaluation criteria, in peer evaluation and self-assessment, and not only become observers of the teacher's assessment process.

Researchers N. Morze, & V. Vember (2019) presented the trends and features of the implementation of peer assessment in the educational process of higher education institutions, identified the disadvantages and advantages of peer and traditional assessment, and highlighted the essential features of peer and formative assessment. Among the ways to avoid the shortcomings of traditional assessment proposed by scientists is the introduction of ICT tools to support peer assessment and the combination of peer and traditional assessment.

A. Hryvko, & L. Vashchenko (2021) devoted their scientific work to determining the place of current and formative assessment of students. In the research process, it was established that the primary priority is the method and strategies of using these types of assessments by the teacher. Scientists have proven that the current and formative assessment do not replace, but complement each other. The positive and



negative aspects of formative educational assessment based on the activity approach and formative diagnostic assessment based on the instrumental approach were substantiated.

The same problem, namely: features and ways of applying formative assessment in institutions of higher education, was investigated by E. Bazhmina (2020). She presented six conditions in higher education that are effective in formative assessment – the presence of feedback from students, tracking the achievement of the set goal by each student, formulating learning goals in the group, using assessment tools to create a culture of encouragement, using different approaches, different methods training for the assessment of higher education applicants, their active involvement in training. There should be constant interaction between students of higher education and the teacher to achieve the goal of formative assessment and teaching, in general, to teach to learn. O. Boiko's (2023) study reveals the theoretical aspects of the main types of assessment, the study is devoted to the problem of assessment in English language classes. The results of research on the main types, methods, and means of evaluation are highlighted. Z. Mohamadi (2018) in his study, compared the effects of online formative and summative assessment.

So, we can see that the majority of research by scientists is devoted to the theoretical aspects of assessment, in particular, studies of traditional and computer-based assessment, a comparison of formative and summative assessment, and only isolated studies talk about the importance of peer assessment for education and the introduction of peer assessment into the educational process of higher education institutions.

Therefore, the need to analyze peer learning and peer assessment in higher education institutions is due to the presence of contradictions between:

- The need to form a creative personality and the limitations of available methods of professional and pedagogical training;
- The collective nature of education and the individual process of assimilation of students' knowledge;
- Modern requirements for the quality of professional training of specialists and ways of their implementation;
- The possibilities of choosing methods of training a specialist in practice and the lack of scientifically based technologies for the organization of mutual learning.

The topicality of the problem and its insufficient theoretical and practical elaboration led to the choice of the topic of the article.

THE PURPOSE OF THE ARTICLE is to determine the features and outline the advantages of innovative technologies in the field of assessment over traditional, digital tools and methods of implementing peer assessment in the educational process of higher education institutions.

THE RESEARCH HYPOTHESIS is that awareness of the disadvantages and advantages of peered and traditional assessment will help educators to effectively combine peered and traditional assessment in higher education institutions.

Methodology

In the process of scientific research, the following research methods were used:

- **Theoretical:** analysis, comparison, and systematization of methodical, educational, and scientific literature on the subject of research, which outlined the directions of development of progressive advanced ideas in this field, made it possible to realize the shortcomings of peering and traditional evaluation and their advantages, to find out the level of scientific development of the research problem, to determine methodical principles of the raised problem;



- **Empirical:** indirect and direct observation, surveys, and questionnaires, which made it possible to systematize and generalize statistical and analytical material; a pedagogical experiment to reveal the real state of innovative technologies in the field of assessment over traditional, digital tools and methods of introducing peer assessment into the educational process of higher education institutions;
- **Mathematical:** (ranking, mathematical analysis, data processing);
- **Statistical:** for statistical digital processing, summarization of the obtained results.

When determining the sample of respondents, the general specificity of the research subject was taken into account, that awareness of the disadvantages of peering and traditional assessment and advantages will help teachers to effectively combine peering and traditional assessment in institutions of higher education.

The total sample size is 184 respondents, from which the control (94 people) and experimental (90 people) groups were formed. When forming the sample, the criteria of equivalence, representativeness, and content were taken into account.

The choice of research methods was determined by the possibilities of the method itself, its reliability, and its validity.

The questions as a result of the research for the respondents are aimed at understanding the set goals, the ability to apply innovative and interactive knowledge assessment technologies regarding the organization of the learning process, decision-making flexibility, clarifying the assessment of the pedagogical situation, mastering pedagogical skills in peering and traditional assessment.

We have identified three levels of implementation of peer assessment in the educational process of higher education institutions (high, medium, and low).

The sample was formed using the technical procedure of calculating the selection step by random selection. To identify changes and conditions in the levels of training of future specialists for the organization of digital tools and methods of implementing peer evaluation in the educational process of higher education institutions in both groups, a research procedure was implemented using several diagnostic methods.

We applied Pearson's χ^2 homogeneity criterion in the priorities of CG and EG students to assess the statistical reliability of the identified changes to select digital tools and methods for implementing peer evaluation in the educational process of higher education institutions. What is quite productive: when comparing frequency distributions that were formed based on the results (carried out in this same group) of two measurements of the characteristic under study; when comparing the frequency distributions of the same characteristic that was measured in two groups.

The generalized answers of the respondents showed that before the experiment, 86.0% of the respondents of the CG and 83.7% of the EG students noted that they assessed the level of preparation for the introduction of peer assessment in the educational process of higher education institutions as low and medium. The shares of respondents with a high level of self-esteem regarding evaluation are quite small: 14.0% in CG and 16.3% in EG.

After the formative stage of the experiment, significant statistical changes in the distributions were observed in EG due to a significant decrease (by 24.3%) in the number of higher education applicants with a low level of peer evaluation opportunities and an increase (by 18.4%) in the share of such respondents who evaluate as this level is high. There was also an increase (by 47.8%) of respondents with an average level. So, we state that in the process of the formative experiment, the measures carried out helped to increase the level of implementation of peer evaluation in the educational process of higher education institutions among EG respondents, which testifies to the effectiveness of the proposed model.



Results and Discussion

Types of control and the most important principles of knowledge assessment of higher education students.

Traditionally, the same types of control are used in the educational process of higher education institutions: current, preliminary, thematic, final, periodic, and final (Leleka et al., 2022).

It should be noted that the most important principles of knowledge assessment of students of higher education are: thematic orientation, individual nature of knowledge assessment, demandingness, differentiation, objectivity, systematicity, and motivation. It is these principles that determine the criteria for the norm of knowledge evaluations of students of higher education, which include in their content a list of conditions by which the teacher is guided when evaluating the success of students of higher education because the criteria of evaluations are considered to be the rules that the teacher himself takes into account when assigning evaluations. Taking into account the specifics of specific disciplines and assessment criteria, requirements are set for the assessment of knowledge when using different types of control (Sulym et al., 2023). Such an evaluation system does not satisfy modern higher education. The main reasons for this are the rapid accumulation of knowledge before and after the session their rapid forgetting, and insufficient motivation for learning (Budnyk et al., 2022).

The modular rating system of the training organization.

The application of the modular rating system justifies the experience of many European states. Because it is with such an approach that the education process is significantly simplified, and the knowledge assessment system is more transparent. The teacher can constantly monitor the educational process. It is the modular rating system of classes that creates such an organization of learning, which, according to the principle of modularity, provides for the study of the material with the subsequent rating assessment. At the same time, the module is a logically complete system of actual skills and theoretical knowledge from a certain educational discipline with a determined optimal time for organizing its assimilation and adapting to the individual characteristics of students of higher education (Altameemi & Alomaim, 2022). Each academic discipline consists of modules – according to the modular rating system of the organization of education. Modules are a long-term activity where strategic tasks and goals are set; internal motivational urges are thought through; a program of implementation of the planned goals is drawn up; monitoring of the success rate of higher education applicants and the implementation of the program is carried out. The organization of such an educational process makes it possible to fully implement the components of the cycle of knowledge acquisition: comprehension, perception, memorization, awareness of new knowledge, formation of relevant abilities and skills, systematization, and generalization of knowledge. Under such conditions, the opportunity to catch up on material not learned in time and to analyze the level of mastery of the educational discipline increases, as well as the time for independent individual work increases and the role of collective forms of learning increases. In educational practice, the rating is considered a numerical value, which, as a rule, is a comprehensive indicator of the quality of knowledge of a student of higher education, expressed on a multi-point scale and compared with the success of his peers in several or one subjects during a certain period of study (semester, year, module, etc.). The sum of grades accumulated during a certain period of study is a quantitative indicator of the quality of work of a student of higher education. A student of higher education, performing specific work, should know in advance what the minimum number of points or the maximum he can receive as a result of successful activity. It is necessary to know the conditions that make it possible to automatically take the semester exam, issue a credit, etc., and under which the student of higher education will score the highest number of points. A student of higher education should receive different points for different forms of control, depending on the difficulty of the task (Dzhurynskyi et al., 2023).

The main requirements for applying the rating are methodical support, implementation of appropriate preparatory work, the readiness of teachers and students of higher education, and independent work of



students of higher education. In the context of global trends in the development of the educational sphere, the introduction of a rating assessment of success in institutions of higher education of students of higher education makes it possible to say that modern methods of educational achievements of students of higher education and control of knowledge increase objectivity in assessment, form a more responsible attitude to learning, reduce the psychological burden during the exam, strengthen the motivational component, introduce healthy competition, turn control into an active component of the management process and form the independence of actions of higher education applicants (Yakimenko et al., 2023).

Education in "peer-to-peer" conditions, or peering education.

It is necessary to fundamentally review the state of education, and compare and analyze it with European standards to determine the direction of approach to the world and European scientific and educational space and improvement at the current stage of development of each state. The problem of the quality of knowledge assessment of higher education seekers is an important element of the educational process and requires substantiation, understanding, approbation, and development of promising methods and technologies and the creation of systems of their formation adapted to the modern educational space; definition of successful learning (Plakhotnik et al., 2023).

Peer-to-peer training, or peering training, aims to actively involve all participants in the educational process. Let's consider what is at the basis of peering training:

- Equality of all students of higher education;
- With the help of the organization of interaction of higher education seekers to solve set tasks;
- A pronounced subject-subject character of communication of higher education seekers, aimed at achieving the set pedagogical goals;
- Taking into account the influence of each student of higher education on the network community;
- Taking into account the influence of the community on each of the students of higher education.

The content of peer assessment is recognized as an integral part of formative assessment and has a different focus than self-assessment. The researchers "consider peer assessment as an independent strategy, but more often it is considered complementary to self-assessment" (Kuchai et al., 2017).

The definitions of peer evaluation are quite diverse:

- Peer evaluation, which involves the assessment by a higher education student of the results of the educational activities of another higher education student;
- Peer assessment is a strategy that involves higher education students making "decisions about other people's work that usually occur when students work together on joint projects or learning tasks" (Plakhotnik et al., 2022);
- Peer evaluation is an assessment by a higher education student of the results of the educational activities of another higher education student (Boiko, 2023);
- Peer evaluation is "synonymous with peer evaluation in theses" (Kanivets, 2012).

System of peering interaction using ICT.

The specificity of peering interaction, and peering education with the use of ICT lies in the innovativeness of such opportunities that did not exist before. The basis of peering interaction is Web 3.0 technologies, the Internet, a large number of open educational resources (OER), and mass digitization of various materials. Peer 2 Peer University (P2PU) is an example of peering interaction and its successful functioning system.

Thematic blogs can also serve as a means of peering (Nedder et al., 2017). Scientists, in the field of professional education, recorded an increase in interest in the educational material of students of higher



education, proving the effectiveness of blogging for the systematic improvement of the qualifications of specialists, since students of higher education could freely create forums for discussion, submit innovative material, feeling interest among their colleagues in publications and project support. Peer-to-peer interaction provides convenient access to resources and an opportunity for a friendly and professional atmosphere; mutual assistance promotes the ability to cooperate, respond quickly to innovative educational challenges in the educational space, develop professional qualities, and be tolerant of other opinions.

Advantages of peer learning.

The advantages of peer education are (Morze & Vember, 2019):

- Quick reaction to changes in the market situation;
- Increasing the level of compliance with educational, socio-cultural, and socio-economic needs of society, and new market requirements;
- Adaptability of specialists, and educational organizations to rapidly changing conditions;
- Elimination of duplication of several functions by participants of network interaction;
- The concentration of activities of network interaction participants on their key academic and professional competencies, innovative unique processes taking place in the field of education;
- Involvement of competent participants in the implementation of joint professional and academic activities, possessing the necessary resource potential;
- In the process of achieving certain results, the implementation of partnership relations;
- Increasing the rates of generation, rates of efficiency, and translation of specialized knowledge;
- Replication of best practices, increasing the efficiency of information exchange mechanisms and innovative practices among participants of informal network interaction;
- The absence of temporal and spatial restrictions;
- Desire and readiness for changes by the requirements of a changing world, a high level of innovative activity, and increasing requirements for the level of professionalism of a specialist.
- Increasing the level of competitiveness of peering training participants.

So, we can see that the specificity of peer education, where peer assessment is a component, is that it consists of opportunities that did not exist before. Web 3.0 technologies, the Internet, a large number of open educational resources, and mass digitization of various materials are its basis (Morze et al., 2017). During peer learning and peer assessment, teachers work together with students of higher education to provide comprehensive support, help in designing assessment and their own education strategy, and act as tutors, mentors, and facilitators (Morze & Vember, 2019).

Possibilities for peer assessment are provided in the exploratory learning spaces applications.

To provide peer assessment, user-friendly applications Table Tool, Question Scratchpad, and Peer Assessment Tool have been developed. Peer evaluation can also be implemented using Google applications. There are also possibilities for peer assessment in applications of inquiry learning spaces (Inquiry Learning Space – ILS). Which, using the tools of the Graasp platform, can be created by students of higher education (website address: <http://graasp.eu>).

During peering, students of higher education should be aware of the specifics of assessment, access to necessary resources, and the ability to work in a group and individually. It is important to take this into account during the educational process at a higher education institution (Karhut et al., 2023).

Features of peer evaluation and consideration of these features when developing evaluation criteria.

Peer evaluation features include:



- Organization of work of students of higher education in groups or pairs to evaluate each other;
- The presence of clear wording for evaluation criteria,
- Application of the principle of double anonymity: applicants of higher education do not know who evaluated them and applicants of higher education do not know who they are evaluating.

When developing evaluation criteria, it is taken into account that:

- The work of students of higher education is compared not with the work of other students of higher education, but with the model proposed by the teacher and evaluated according to the criteria;
- The criteria are aimed at evaluating the work of higher education applicants (at the final or intermediate stage);
- A student of a higher education institution must use a clear evaluation algorithm, according to which the student of higher education can independently determine his evaluation and his level of achievements;
- Criteria for higher education applicants should be known in advance. "The evaluation criterion is a concrete expression of the degree of achievement of educational goals. You can only evaluate what is taught" (Morze et al., 2017).

Experimental study.

The implementation of the pedagogical experiment was carried out in three stages: preparatory, main, and final.

At the preparatory stage, the purpose and tasks of the research were defined, the experimental plan was developed, methods of measurement and processing of results were selected, control and experimental groups were selected, and their homogeneity was checked.

At the main stage, an experiment was conducted.

At the final stage, the results of the experiment were analyzed, their reliability was confirmed, and conclusions were drawn about the pedagogical effect of the experiment.

The reliability and validity of the obtained results, and the objectivity of their evaluation were ensured by the methodological validity of the initial positions and the qualitative mechanism of the assessment of the quality under study, the use of a complex of complementary research methods, and the involvement of a group of respondents from a higher educational institution in the analysis of its results.

To assess the homogeneity of experimental and control data, statistical processing was performed using MS Excel and SPSS (Statistical Package for Social Science).

In our study, we consider peer evaluation in higher education institutions as an important strategy that involves one person making decisions about the work of other people, which occurs when specialists work together on educational tasks or joint projects. We consider peer evaluation in institutions of higher education to be complex, dynamic, and necessary, such that it is represented by the interaction of subjective (taking into account the level of professional mastery by the future profession of the future specialist and his psychological and pedagogical qualities and processes of professional self-development) and objective (educational space) reality.

We took into account the main provisions of psychological and pedagogical science when developing the experiment program, which relates to the problem of defining features, outlining the advantages of innovative technologies in the field of assessment over traditional ones; digital tools, and methods of implementing peer assessment in the educational process of higher education institutions.



When determining the sample of respondents, the general specificity of the research subject was taken into account, that awareness of the disadvantages of peering and traditional assessment and advantages will help teachers to effectively combine peering and traditional assessment in institutions of higher education.

The total sample size is 184 respondents, from which the control (94 people) and experimental (90 people) groups were formed. When forming the sample, the criteria of equivalence, representativeness, and content were taken into account.

In the course of the experimental study, features were determined, outlining the advantages of innovative technologies in the field of evaluation over traditional ones, digital tools, and methods of introducing peer evaluation into the educational process of higher education institutions.

The study hypothesized that awareness of the disadvantages and advantages of peered and traditional assessment will help teachers to effectively combine peered and traditional assessment in institutions of higher education.

Preparatory stage.

In the process of scientific research, the following research methods were used: theoretical: analysis, comparison, systematization of methodical, educational, scientific literature on the subject of research, which outlined the directions of development of progressive advanced ideas in this field, made it possible to realize the shortcomings of peering and traditional evaluation and their advantages, with clarify the level of scientific development of the research problem, determine the methodological principles of the problem; empirical: indirect and direct observation, surveys, questionnaires, testing, diagnostic methods, which made it possible to systematize and summarize statistical and analytical material; a pedagogical experiment to reveal the real state of innovative technologies in the field of assessment over traditional, digital tools and methods of introducing peer assessment into the educational process of higher education institutions; mathematical: (ranking, mathematical analysis, data processing); statistical: for statistical digital processing, summarization of the obtained results.

The choice of research methods was determined by the possibilities of the method itself, its reliability, and its validity.

The questions as a result of the research for the respondents are aimed at understanding the set goals, the ability to apply innovative and interactive knowledge assessment technologies regarding the organization of the learning process, decision-making flexibility, clarifying the assessment of the pedagogical situation, mastering pedagogical skills in peering and traditional assessment.

We have identified three levels of implementation of peer assessment in the educational process of higher education institutions (high, medium, and low).

The **high level** of implementation of peer evaluation by respondents in the educational process of higher education institutions – high flexibility and predictability in decision-making, possession of innovative and interactive technologies for the organization of peer evaluation at a creative and professional level.

The **average level** is insufficient awareness of respondents with the possibilities of implementation and application of forms and methods of peer evaluation, the use of digital tools and methods of implementation of peer evaluation in the educational process of higher education institutions at the reproductive-adaptive level, and partial readiness for self-improvement.



The **low level** – lack of independence, insufficient mastery of innovative and interactive technologies regarding the organization of peer evaluation in the educational process of higher education institutions, weak introspection of one's own professional capabilities, and passivity in decision-making.

The sample was formed using the technical procedure of calculating the selection step by random selection. To identify changes and conditions in the levels of training of future specialists for the organization of digital tools and methods of implementing peer evaluation in the educational process of higher education institutions in both groups, a research procedure was implemented using several diagnostic methods. Main stage.

Summarizing the answers of the respondents regarding their priorities in the choice of assessment forms allows us to state that before the experiment, a significant part of the respondents of the experimental (39.7%) and control (41.7%) groups declared that they were supporters of the use of traditional survey forms (the average level in determining priorities regarding the choice of assessment forms).

At the ascertainment stage of the experiment, the following results were obtained: in CG (28.7%) and EG (26.8%) respondents indicated that they prefer the use of standard forms of evaluation, which provide for strict regulation in the educational process (low level).

Table 1.
Results of the ascertaining stage of the experiment

Group	%
Control Group (CG)	28,7
Experimental Group (EG)	26,8

The possibilities of implementing digital tools and methods of implementing peer evaluation in the educational process of higher education institutions are underestimated by students of higher education, as a small number of respondents indicated that the use of peer evaluation in the educational process of higher education institutions is a priority for them (high level). So, we can say that a significant part of future specialists in their future professional activity is oriented toward the implementation of the traditional assessment paradigm in the organization of the educational process.

However, at the current stage of the educational space, the formation of a creative and competitive personality is required, capable of quickly switching to other types of activities, producing non-traditional ideas, adapting to new conditions, showing creativity in work, thinking critically, successfully communicating with others, being able to use digital tools and methods of peer evaluation in the educational process. It is impossible to achieve these goals when implementing traditional assessment, therefore it is necessary to change approaches to education by introducing digital tools and methods of peer assessment into the educational process of higher education institutions.

It is necessary to move from prescriptive and cognitive assessment of the knowledge of higher education seekers to the introduction of digital tools and methods of peer assessment in the educational process of higher education institutions and to achieve reflective, activity-based, competency-based approaches and a personally oriented paradigm in the educational process.

Final stage.

Based on the results of the ascertainment experiment and the conclusions regarding the renewal and improvement of the educational sector, in general, and the evaluation of higher education applicants, in particular, a model of digital tools and methods of introducing peer evaluation into the educational process of higher education institutions was introduced into the educational process of higher education institutions. Based on the results of the implementation of such a developed model, we conclude that after the formative experiment in EG, the shares of respondents who are supporters of using traditional assessment (33.2%,



dynamics – 8.9%) and prescriptive (16.7%, dynamics – 12.1%). The number of respondents who support digital tools and methods of implementing peer evaluation in the educational process of higher education institutions increased by 20.6%.

In the context of our research, the fact that the number of respondents in EG increased (by 13.1%) and understanding that the use of digital tools and methods of implementing peer evaluation in the educational process of higher education institutions not only ensures better assimilation of knowledge by students of higher education and the formation of skills and abilities in them, as well as increasing the ability for reflection, self-development, independence, productive interpersonal interaction, analysis of the evaluation situation from one's own position, managing emotions, correcting and comparing one's capabilities and interests, building partnership interaction in the team when implementing peer evaluation in the educational process of institutions of higher education.

Pearson's χ^2 data is a convenient statistical method for performing frequency change analysis. This most valuable tool has primarily been used to analyze data that takes into account the combined effect of a particular factor on an outcome. During the experiment, Pearson's χ^2 supported the analysis of the influence of risk factors by calculating relative and absolute risks, as well as odds ratios.

We applied Pearson's χ^2 homogeneity criterion in the priorities of CG and EG students to assess the statistical reliability of the identified changes to select digital tools and methods for implementing peer evaluation in the educational process of higher education institutions. What is quite productive: when comparing frequency distributions that were formed based on the results (carried out in this same group) of two measurements of the characteristic under study; when comparing the frequency distributions of the same characteristic that was measured in two groups.

To diagnose the state and changes in the respondents' levels of self-research, psychological and pedagogical skills of self-knowledge, consequences, and causes of digital tools and methods of introducing peer evaluation into the educational process of higher education institutions, the ability to understand the meaning of evaluation, readiness for perception, self-development of the participants of the educational process were used: the questionnaire "Readiness for the organization of digital tools and methods of implementing peer evaluation in the educational process of higher education institutions."

During the experiment, the respondents were asked to evaluate their level of practical training in solving problems related to the organization of peer evaluation in the educational process of a higher school.

The generalized answers of the respondents showed that before the experiment, 86.0% of the respondents of the CG and 83.7% of the EG students noted that they assessed the level of preparation for the introduction of peer assessment in the educational process of higher education institutions as low and medium. The shares of respondents with a high level of self-esteem regarding evaluation are quite small: 14.0% in CG and 16.3% in EG.

After the control stage of the experiment in CG, the situation practically did not change: in particular, with a high level of self-esteem, the share of higher education applicants increased, about practical training for the introduction of peer assessment in the educational process of higher education institutions (+3.3%) and decreased by 3.4% the number of respondents who rate the level of digital tools and methods of implementing peer assessment in the educational process of higher education institutions as low. These changes in distributions, as the test showed, are random.

After the formative stage of the experiment, significant statistical changes in the distributions were observed in EG due to a significant decrease (by 24.3%) in the number of higher education applicants with a low level of peer evaluation opportunities and an increase (by 18.4%) in the share of such respondents who evaluate as this level is high. There was also an increase (by 47.8%) of respondents with an average level. So, we state that in the process of the formative experiment, the measures carried out helped to increase



the level of implementation of peer evaluation in the educational process of higher education institutions among EG respondents, which testifies to the effectiveness of the proposed model.

Research is largely dependent on the accuracy and reliability of the data. In the framework of research work, the quality of data collection and analysis not only adds weight to the research but also contributes to the formation of sound conclusions, which is the key to academic success.

The following digital data collection tools were useful in the study:

- Google Forms – a simple tool for creating surveys that allows you to collect data from respondents, create different types of questions, and collect answers in spreadsheets.
- SurveyMonkey – a modern survey tool that offers a wide range of customization options and analytical tools for analyzing the collected data.
- JSTOR, Google Scholar, and other academic search engines provide access to scholarly articles, books, and other academic resources that may be useful for literature review and theoretical data collection.
- Zotero or Mendeley – bibliography management programs that help organize research materials, store references, and format bibliographies and citations according to different citation styles.
- Microsoft Excel or Google Sheets – spreadsheets are useful for organizing and analyzing collected data when working with quantitative data.
- SPSS, R, or, Python for more advanced data analysis, statistical analysis, and processing of volumes of data.

Conclusions

The most important principles of knowledge assessment of higher education seekers are thematic orientation, individual nature of knowledge assessment, demandingness, differentiation, objectivity, systematicity, and motivation. The module-rating system of training organization and training in "peer-to-peer" conditions, or peering training, is considered.

The content of peer assessment is recognized as an integral part of formative assessment and has a different focus than self-assessment.

The importance of the system of peering interaction using ICT and the advantages of peering education are shown. The basis of peering interaction is Web 3.0 technologies, the Internet, a large number of open educational resources (OER), and mass digitization of various materials. Peer 2 Peer University (P2PU) is an example of peering interaction and its successful functioning system. The possibilities for peer assessment are provided in the applications of research learning spaces.

Based on the results of the ascertainment experiment and the conclusions regarding the renewal and improvement of the educational sector, in general, and the evaluation of higher education applicants, in particular, a model of digital tools and methods of introducing peer evaluation into the educational process of higher education institutions was introduced into the educational process of higher education institutions. Based on the results of the implementation of such a developed model, we conclude that after the formative experiment in EG, the shares of respondents who are supporters of using traditional assessment (33.2%, dynamics – 8.9%) and prescriptive (16.7%, dynamics – 12.1%). The number of respondents who support digital tools and methods of implementing peer evaluation in the educational process of higher education institutions increased by 20.6%.

Further research will be directed to the consideration of the main positions of the implementation of peer evaluation in the educational process of higher education institutions.



Bibliographic References

- Altameemi, Y. M., & Alomaim, T. I. (2022). Analyzing Assistance Discourse Provided to Stakeholders to Utilize E-Learning in the Higher Education. *Amazonia Investiga*, 11(52), 318-333. <https://doi.org/10.34069/AI/2022.52.04.34>
- Bazhmina, E. A. (2020). Formative assessment: goals, conditions, principles and structure. *Bulletin of the Cherkasy National University named after Bohdan Khmelnytskyi*, 4, 130-137. <https://ped-ejournal.cdu.edu.ua/article/view/4048>
- Boiko, O. (2023). Overview of the main types, methods, and assessment tools in English language lessons. *Educational Horizons*, 1(56), 39-50. <https://doi.org/10.15330/obrii.56.1.39-50>
- Budnyk, O., Rembierz, M., Arbeláez-Encarnación, T. F., Rojas-Bahamón, M. J., Arbeláez-Campillo, D. F., Chinchoy, A., & Matveieva, N. (2022). Formation of tolerance in the inclusive environment of an educational institution. *Amazonia Investiga*, 11(56), 305-319. <https://doi.org/10.34069/AI/2022.56.08.29>
- Dzhurynskyi, P., Broiakovskyi, O., Tsviakh, O., Koshliak, M., Turchak, A., & Zalizniak, A. (2023). Innovative dimension of effectiveness in physical education student learning. *Amazonia Investiga*, 12(72), 167-179. <https://doi.org/10.34069/AI/2023.72.12.15>
- Hryvko, A., & Vashchenko, L. (2021). Current and formative assessment in the basic senior professional school. *Ukrainian Pedagogical Journal*, 2(2), 72-83. <https://doi.org/10.32405/2411-1317-2021-2-72-83>
- Kanivets, T. M. (2012). *Basics of pedagogical assessment: Educational methodological manual*. Nizhin: Publisher PP Lysenko M.M. https://moodle.ndu.edu.ua/file.php/1/Konivets_Osnovy_Ped_Jtsinuvannia.pdf
- Karhut, V., Semenog, O., Shumiatska, O., Palamar, N., & Rubliova, N. (2023). The need for new information technologies during foreign language learning for the quality training of a specialist. *Amazonia Investiga*, 12(65), 175-184. <https://doi.org/10.34069/AI/2023.65.05.17>
- Kuchai, O., Kuchai, T., & Pyrzyk, I. (2017). Studying the peculiarities of education development in Japan (in terms of primary education). *Science and Education*, 25(5), 34-40. <https://doi.org/10.24195/2414-4665-2017-5-7>
- Leleka, V., Zabiaka, I., Tsviakh, O., Grubi, T., & Vytrykhovska, O. (2022). Innovative approaches to teaching students in the modern educational environment in the USA and Great Britain. *Amazonia Investiga*, 11(60), 156-166. <https://doi.org/10.34069/AI/2022.60.12.17>
- Maksymchuk, L., Artimonova, T., Kurchatova, A., Ishchenko, L., & Vovkochyn, L. (2023). Theoretical foundations of implementation blended learning in the process of training future specialists. *Amazonia Investiga*, 12(69), 61-72. <https://doi.org/10.34069/AI/2023.69.09.5>
- Mohamadi, Z. (2018). Comparative effect of online summative and formative assessment on EFL student writing ability. *Studies in Educational Evaluation*, 59, 29-40. <https://doi.org/10.1016/j.stueduc.2018.02.003>
- Morze, N., & Buinytska, O. (2021). *Modernization of education in the digital dimension: monograph*. Kyiv: Kyiv University named after B. Grinchenko. https://elibrary.kubg.edu.ua/id/eprint/38542/1/N_Morze_O_Buinytska_MoPed_Monograph_FITU_NDL_IO.pdf
- Morze, N., & Vember, V. (2019). Implementation of peer assessment in the educational process. *Electronic Scientific Professional Journal "Open educational e-environment of modern university"*, (6), 44-54. <https://doi.org/10.28925/2414-0325.2019.6.4454>
- Morze, N., Vember, V., & Varchenko-Trotsenko, L. (2017). Formative and peer assessment in higher education. In *IT tools – Good practice of effective use in education* (pp. 159-180). Katowice Cieszyn: University of Silesia in Katowice, Publishing House Studio-Noa. <https://us.edu.pl/wydzial/wsne/wp-content/uploads/sites/20/Bez-kategorii/10-Morze-et.all-FORMATIVE-AND-PEER.pdf>



- Nedder, M. M., Levine, S. A., Galligan, C., Avery, K. R., Eagan-Bengston, E., & Reilly, K. M. (2017). Blogging as an innovative method of peer-to-peer educational sharing. *Critical Care Nurse*, 37(1), e1-e9. <https://doi.org/10.4037/ccn2017642>
- Plakhotnik, O., Strazhnikova, I., Yehorova, I., Semchuk, S., Tymchenko, A., Logvinova, Ya., & Kuchai, O. (2022). The Importance of Multimedia for Professional Training of Future Specialists. *International Journal of Computer Science and Network Security*, 22(9), 43-50. <https://doi.org/10.22937/IJCSNS.2022.22.9.7>
- Plakhotnik, O., Zlatnikov, V., Strazhnikova, I., Bidyuk, N., Shkodyn, A., & Kuchai, O. (2023). Use of information technologies for quality training of future specialists. *Amazonia Investiga*, 12(65), 49-58. <https://doi.org/10.34069/AI/2023.65.05.5>
- Sulym, V., Melnykov, A., Popov, M., Vechirko, O., & Malets, D. (2023). Improving education through implementation of information technologies into the educational process. *Amazonia Investiga*, 12(68), 281-293. <https://doi.org/10.34069/AI/2023.68.08.26>
- Yakimenko, P., Horvat, M., Kurchatova, A., Mulyk, K., & Alekseeva, O. (2023). The features of independent work for future specialists in conditions of distance learning. *Amazonia Investiga*, 12(62), 240-249. <https://doi.org/10.34069/AI/2023.62.02.24>



DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.11>



Cómo citar:

Molodovska, Y., Vainola, R., Lisnevskaya, N., Biriuk, L., Kostenko, L., & Bosyi, O. (2024). Use of interactive technologies in an innovative educational environment. *Revista Eduweb*, 18(3), 134-156. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.11>

Use of interactive technologies in an innovative educational environment



Uso de tecnologías interactivas en un entorno educativo innovador

Yuliia Molodovska

 <https://orcid.org/0009-0006-0042-2109>
 WoS Researcher ID: KSM-9231-2024
julia859999@gmail.com



Graduate Student of the Department of Pedagogy and Educational Management, Odesa Regional Academy of In-Service Education of the Odesa Regional Council, Ukraine.

Roman Vainola

 <https://orcid.org/0009-0003-5872-5194>
 WoS Researcher ID: KTI-0256-2024
dungeon.master3001997@gmail.com



Postgraduate Student of the Department of Primary Education and Innovative Pedagogy, Drahomanov Ukrainian State University, Ukraine.

Nataliia Lisnevskaya

 <https://orcid.org/0000-0001-7910-7932>
 WoS Researcher ID: HDO-4312-2022
lisnevsky.nv@gmail.com



Candidate of Pedagogical Sciences, Associate Professor, Associate Professor of the Department of Theory and Methodology of Preschool Education, Oleksandr Dovzhenko Hlukhiv National Pedagogical University, Ukraine.

Liudmyla Biriuk

 <https://orcid.org/0000-0003-4940-4228>
 WoS Researcher ID: EMI-9458-2022
biryuuk.51@gmail.com



Doctor of Pedagogical Science, Professor Primary Education Pedagogy and Psychology Department, Oleksandr Dovzhenko Hlukhiv National Pedagogical University, Ukraine.

Larysa Kostenko

 <https://orcid.org/0000-0003-2930-7404>
 WoS Researcher ID: GNM-8992-2022
shkoda44@ukr.net

Doctor of Pedagogical Sciences, Associate Professor of the Department of Pedagogy and Special Education, Volodymyr Vynnychenko Central Ukrainian State University, Ukraine.

Oleksandr Bosyi

 <https://orcid.org/0000-0002-8849-3932>
 WoS Researcher ID: IRZ-0341-2023
obosyi@cuspu.edu.ua

Postgraduate student of the Department of Pedagogy and Special Education, Volodymyr Vynnychenko Central Ukrainian State University, Ukraine.

Recibido: 02/08/24
Aceptado: 10/09/24



Abstract

The article analyzes the content and system of interactive technologies in an innovative educational environment, substantiates the components of interactive technology, and reveals the main pedagogical idea and main requirements in the mode of interactive technology for successful learning. Types of active methods in the mode of interactive technology are grouped and analyzed for successful learning and stimulation of the natural activity of students. Ways of creating an innovative educational environment in a higher education institution in the mode of interactive technology are shown. The most effective technologies that we recommend in the interactivity mode have been analyzed. The stages of development of interactive learning technology in the innovative educational environment of a higher school are shown. The impact of the active implementation of information and communication technologies, modern digital tools, and new technological means of learning on the possibilities of using interactive technologies in an innovative educational environment is proven. This is due to the need for innovative training of a generation of new specialists capable of competently and quickly applying the results of scientific and technical progress in professional and educational activities, in particular, the Internet, web technologies, smartphones, digital educational platforms, cloud services, electronic educational resources, artificial intelligence, and other modern devices.

Keywords: interactive technologies, interactive learning methods, innovative educational environment, the innovative position of a specialist, innovative activity.

Resumen

El artículo analiza el contenido y el sistema de las tecnologías interactivas en un entorno educativo innovador, fundamenta los componentes de la tecnología interactiva y revela la idea pedagógica principal y los principales requisitos en el modo de la tecnología interactiva para un aprendizaje exitoso. Se agrupan y analizan los tipos de métodos activos en la modalidad de tecnología interactiva para lograr un aprendizaje exitoso y estimular la actividad natural de los estudiantes. Se muestran formas de crear un entorno educativo innovador en una institución de educación superior mediante la tecnología interactiva. Se han analizado las tecnologías más efectivas que recomendamos en el modo interactividad. Se muestran las etapas de desarrollo de la tecnología de aprendizaje interactivo en el entorno educativo innovador de una escuela superior. Está comprobado el impacto de la implementación activa de tecnologías de la información y la comunicación, herramientas digitales modernas y nuevos medios tecnológicos de aprendizaje sobre las posibilidades de uso de tecnologías interactivas en un entorno educativo innovador. Esto se debe a la necesidad de una formación innovadora de una generación de nuevos especialistas capaces de aplicar de manera competente y rápida los resultados del progreso científico y técnico en actividades profesionales y educativas, en particular, Internet, tecnologías web, teléfonos inteligentes, plataformas educativas digitales, la nube. servicios, recursos educativos electrónicos, inteligencia artificial y otros dispositivos modernos.

Palabras clave: tecnologías interactivas, métodos de aprendizaje interactivos, entorno educativo innovador, posición innovadora de un especialista, actividad innovadora.

Introduction

New requirements for the content, organization of the learning process, and the entire educational environment shape modernity, changing the essence of education and its results. Interactive technologies make it possible to make the educational process more interesting and active, based on the personal expression of education seekers and teachers and their active interaction. This makes it possible to shift the emphasis on the development of innovative activities of education seekers and their ways of thinking from simple assimilation of information.

The leading idea of modern training of a creative and innovative personality is the promotion of the development of natural gifts, qualities, success, and intellectual capacity; formation of intellectual potential;



adjustment to further active, creatively conscious self-activity, which satisfies their aspirations for the manifestation of personal qualities, self-realization, meets the spiritual needs of a person. This creates an effective method for identifying and forming the student's creative potential and comprehensive personality development, which is possible only by creating a subject-subject model of learning in the educational process, where the main importance is given to the use of interactive learning methods (Yermolenko, 2022). Modern science is characterized by the search for interactive technologies, the creation of conditions for innovation aimed at the development and formation of a whole, free, creative, competitive personality capable of adaptation, socialization, and self-realization in society, and also creates conditions for revealing the essence of innovative approaches in the educational process and taking into account in their implementation of the main influential components.

Innovative pedagogical activity creates new norms of individually directed, personal, and creative activity of the teacher, associated with the refusal of learning from stereotypes, and develops pedagogical interactive technologies that are implemented in innovative educational activity. Nowadays, this is becoming especially important because the priority of the state policy of society is the optimization of professional training with an emphasis on the result, not on the evaluation of the learning process, not on the duration of learning, but on its quality (Kolisnyk-Humeniuk, 2018).

The variety of innovative technologies includes interactive technologies that involve the interaction of all participants in the educational process, which is carried out using methods that activate pedagogical communication as an equally active intersubjective interaction. Interactive technologies help to intensify independent creative and research work, which contributes to the development of student's creative abilities and cognitive activity.

The experience accumulated today in Ukraine and abroad proves that interactive learning technologies contribute to the intensification of the educational process and the activation of the educational and cognitive activities of students. This is manifested in the need to analyze educational information, creatively approach learning material and therefore make learning more accessible; independently find possible resources to solve problems; develop a strategy for achieving goals and plan specific actions; learn to formulate one's own opinion, express it correctly, prove one's point of view, argue and discuss; learn to listen to another person, respect an alternative opinion; simulate various social situations, enrich one's own social experience through inclusion in various life situations and experience them; learn to build constructive relationships in the group, determine one's place in it, avoid conflicts, resolve them, seek compromises, strive for dialogue; find a joint solution to the problem; to develop the skills of project activity, independent work, and the implementation of creative ideas.

The democratic development of Ukraine led to the restructuring of the system of primary, secondary, and higher education, the development of new programs to improve the conditions and learning outcomes of schoolchildren, and the professional training of teaching staff. In educational documents, emphasis is placed on the development of innovative educational technologies in the educational process to ensure the transition of education to a new, person-oriented paradigm.

The development of interactive technologies in an innovative educational environment is currently an urgent issue of theory and teaching methods in the educational process. Based on this, we considered the following questions in the article:

- Content and system of interactive technologies in an innovative educational environment.
- Components of interactive technology, the main pedagogical idea, and the main requirements in the mode of interactive technology for successful learning.
- Types of active methods in the mode of interactive technology for successful learning.
- The use of interactions in the mode of interactive technology for successful learning and stimulating the natural activity of students.



- Creating an innovative educational environment of a higher education institution using interactive technology.
- Improving the quality of the educational process of the higher school in the mode of interactive technologies.
- Stages of development of interactive learning technology in an innovative educational environment of a higher school.
- The influence of the active implementation of information and communication technologies, modern digital tools, and new technological means of learning on the possibilities of using interactive technologies in an innovative educational environment.

Literature Review

Many world-class scientists have devoted their work to the problem of using interactive technologies in an innovative educational environment.

S. Sysoieva (2011) compiled her research into a teaching methodical guide for teachers of non-formal, formal, and informal education systems, for teachers of post-graduate education institutions and institutions of higher education, and for scientists who are interested in education problems. The scientist considered the concept of "interactivity", revealed its essence; built an andragogical model of interactive learning; considered the criteria for the effectiveness of interactive technologies in the field of education; singled out and showed the advantages of elements of interactive technologies – active forms and methods of learning; painted examples of the use of the case method; substantiated the importance of educational opportunities of common distance learning systems, made their comparative analysis.

O. Demyanchuk & I. Adamovych (2020) devoted their research to the study of the peculiarities of the theoretical foundations of the use of interactive technologies in the educational process of higher education institutions and their structure, in particular, in the context of innovative processes, the scientists revealed the content of interactive learning technologies and the organization of educational activities that take place with the help of interactive learning technologies in the environment of institutions of higher education, using interactive methods as a means of increasing the efficiency of the educational process of higher education.

The result of the author's research is the disclosure of the main classification characteristics of interactive technologies in the process of communication; the content and the essence of the process of their use are outlined; the development of practical aspects and theoretical foundations of the use of interactive technologies in the educational process is proposed; a brief analysis of the discovery and development of the problem by scientists is made. I. Khomyuk, V. Petruk, O. Holiuk, & V. Khomyuk (2020) revealed the main approaches and directions to innovative activity in the modern educational space and showed its conceptual foundations in pedagogical innovation; presented the practical aspects of the effective implementation of innovative modern technologies, which shows the orientation towards the implementation of an innovative approach in higher education. In the study of the importance of interactive learning technologies, scientists put the main emphasis on system-structural and problem-target methods, as well as the diagnostic method of processing and analyzing scientific works, generalization, comparison, systematization, and synthesis in the works of scientists.

The theoretical aspects of the development of educational interactive learning technologies were presented by L. Rebukha (2022), in particular, the foreign experience of the development of interactive learning technologies was analyzed, and the trends in the development of modern innovative technologies were considered. Methodological principles of interactive learning technologies are revealed. In the system of higher education, innovative learning technologies are characterized, in particular, interactive learning technologies, distance and media learning technologies, technologies of a personally oriented educational process, and technologies of creative personality formation as innovations in the educational process of a higher school.



This problem is also solved by I. Konovalchuk (2014) in his research, in particular, he examines the technological and theoretical foundations of the implementation of innovations in educational institutions by analyzing the problem in practice, and the theory of education determines the essential signs of the readiness of innovative educational institutions to implement and accept innovations, substantiates the algorithms of examination and the developed conceptual and content model of the technology of implementing innovations, monitoring, and designing innovations, highlights the competence characteristics of the teacher as a subject in innovative activity, reveals the stages of the experiment and shows the dynamics of the development of the phenomenon under study.

Scientists have proven that the introduction of interactive pedagogical technologies in institutions of higher education promotes the development of students' creativity, initiative, and creativity independence and creates conditions for subject-subject interaction in the professional training of future specialists.

The use of interactive technologies in an innovative educational environment is not sufficiently disclosed in scientific and practical research.

Analysis of scientific research and study of the modern state of the organization of the educational process testified to the presence of contradictions that require effective solutions, in particular, between:

- The need of modern society for the growth of creative potential, a person who can think creatively in non-standard situations, and improper development of practical mechanisms that affect the formation of creative skills;
- Acquired theoretical knowledge and inability to apply it in practical activities, various life situations, creatively analyze the problem;
- The need for interpersonal interaction of students, development of social skills of creative interaction, and traditionally organized educational space;
- The importance of using interactive technologies in the educational process, insufficient determination of their place in the system of other forms, methods, and means, and their role in achieving the goal of education.

The relevance of the specified problem, the insufficient level of its study in pedagogical theory and practice, and the need to overcome the identified contradictions determined the choice of the topic of the article.

The aim of the study. Show the importance of using interactive technologies in an innovative educational environment.

Methodology

The methodological principles of the research are leading provisions of the theory of scientific knowledge; general scientific principles of historicism, systematicity, and scientificity; conceptual provisions of pedagogical, psychological, and sociological sciences; ideas of experience based on the simultaneous study of pedagogical, socio-cultural and economic phenomena; philosophical and pedagogical ideas of the development of modern education.

Various methods were used to achieve the goal of the research, namely: theoretical: general scientific (synthesis, analysis, comparison, classification, generalization and systematization) – in order to clarify the essence of the basic concepts of the research; analysis (in psychological and pedagogical theory and in practice) of the state of the problem under investigation; substantiation of content-methodical provision of training of specialists for the use of interactive technologies in an innovative educational environment; empirical: diagnostic (interview, psychological-pedagogical observation, questionnaire, self-assessment methods) – to determine the readiness of specialists to use interactive technologies in an innovative educational environment; pedagogical experiment; summarizing one's own pedagogical experience – to check the effectiveness of content-methodical training of specialists for the use of interactive technologies



in an innovative educational environment; statistical (methods of mathematical statistics) – for analysis and processing, establishment of scientific reliability of quantitative and qualitative indicators of experimental research.

The implementation of the pedagogical experiment was carried out in three stages: preparatory, main, and final.

At the preparatory stage, the purpose and tasks of the research were defined, the experimental plan was developed, methods of measurement and processing of results were selected, control and experimental groups were selected, and their homogeneity was checked.

At the main stage, an experiment was conducted.

At the final stage, the results of the experiment were analyzed, their reliability was confirmed, and conclusions were drawn about the pedagogical effect of the experiment.

The reliability and validity of the obtained results and the objectivity of their evaluation were ensured by the methodological validity of the initial positions and the qualitative mechanism of the assessment of the quality under study, the use of a complex of complementary research methods, and the involvement of a group of respondents from a higher educational institution in the analysis of its results.

Research relies heavily on the accuracy and reliability of the data. In the framework of research work, the quality of data collection and analysis not only adds weight to the research but also contributes to the formation of sound conclusions, which is the key to academic success.

The following digital data collection tools were useful in the study:

- *Google Forms* – a simple tool for creating surveys that allows you to collect data from respondents, create different types of questions, and collect answers in spreadsheets.
- *SurveyMonkey* – a modern survey tool that offers a wide range of customization options and analytical tools for analyzing the collected data.
- *JSTOR*, *Google Scholar*, and other academic search engines provide access to scholarly articles, books, and other academic resources that may be useful for literature review and theoretical data collection.
- *Zotero* or *Mendeley* – bibliography management programs that help organize research materials, store references, and format bibliographies and citations according to different citation styles.
- *Microsoft Excel* or *Google Sheets* – spreadsheets are useful for organizing and analyzing collected data when working with quantitative data.
- *SPSS*, *R*, or *Python* for more advanced data analysis, statistical analysis, and processing of volumes of data.

When determining the sample of subjects, the general specificity of the research subject was taken into account. The total volume of the sample is 158 subjects. When forming the sample, the criteria of meaningfulness, representativeness, and equivalence were taken into account. The sample was formed by random selection using the technical procedure for calculating the selection step.

The experiment was conducted in Drahomanov Ukrainian State University, Oleksandr Dovzhenko Hlukhiv National Pedagogical University, Volodymyr Vynnychenko Central Ukrainian State University. The conduct of the experiment is permitted by the scientific councils of the universities in order not to violate ethical considerations in institutions of higher education.

During the experimental work, we created a program for the use of interactive technologies in an innovative educational environment of a higher school, where we involved all members of the teaching staff in the processes of change, which contributed to the realization of the main tasks of personality development.



Research and experimental work showed that the leading role in the implementation of innovations aimed at the formation of a creative personality and the development of its individuality is performed by the teacher at the level of an educational institution, under whose leadership it is necessary to carry out the process of innovative training of specialists to solve ways of using interactive technologies in an innovative modern professional environment. During the survey, the level of readiness of students of graduation courses and teachers of a higher education institution to use interactive technologies in an innovative educational environment of a higher school was studied. Respondents were allowed to single out several items of answers during the questionnaire.

The implementation of interactive technologies in the innovative space of a higher school forms the innovative position of a specialist and contributes to the readiness of future specialists for innovative activities during their lifetime.

To assess the homogeneity of experimental and control data, statistical processing was performed using MS Excel and SPSS (Statistical Package for Social Science).

Results and Discussion

Content and system of interactive technologies in an innovative educational environment.

Active learning is interactive because it allows it to teach its participants in cooperation. The experience of each participant, his knowledge, and the learning process, in this case, are extremely valuable.

"Interactive – means the ability to interact or be in the mode of conversation or dialogue with something (for example, a computer) or someone (a person). Therefore, interactive learning is, first of all, dialogic learning, during which the teacher and student interact" (Lalak, 2011).

The value for the teacher is that interactive learning allows him to rationally use class time and, at the same time, allows the student of higher education to express himself in the educational process and during independent work. Therefore, the use of modern interactive learning technologies – educational technologies in higher education classes will make classes innovative and meaningful, and the teacher, at the same time, easily involves students of higher education in the learning process (Yermolenko, 2022).

O. Pometun & L. Pyrozhenko (2004) note: "The essence of interactive learning is that the learning process takes place under the conditions of constant, active interaction of all students. This is co-learning, mutual learning (collective, group learning in cooperation)...". The essence of this definition suggests that interactive learning technology has:

- Clearly defined learning outcomes (personal value orientations, specific qualities, abilities, knowledge, skills);
- Elements (participants) of the technological chain (students, teacher, learning methods, active forms, means and sources of learning);
- Functions of each element;
- A plan for sequential inclusion of elements in the technological process (a plan for the educational process of a higher school);
- A manager who manages the learning process (a teacher taking into account the requests and needs of students of higher education). It is these components that form the system of human competitiveness to acquire the desired competencies by the student (Sysoieva, 2011).

Having analyzed the modern scientific achievements of researchers, we claim that interactive technology in an innovative educational environment can be interpreted as:



- Introduction of creative ideas, means and methods, methods, and professional actions of the future specialist in practical work, aimed at the entire educational process of the higher school, starting with the goal and ending with the expected results;
- The unification of methods, forms, and technologies of means (qualitatively new components of the educational system) aimed at a high-quality, innovative educational process, increasing its effectiveness.

The main interactive technologies in the innovative educational environment include person-oriented and project-based learning, technologies of individualization of the learning process, group learning activities, games, integrated research, networks, and multimedia learning technologies (Khomyuk et al., 2020).

Components of interactive technology, the main pedagogical idea, and the main requirements in the mode of interactive technology for successful learning.

Speaking about interactive technology in an innovative educational environment as a system, let's consider the main components it contains:

- Qualitative and quantitative clear, in the form of educational achievements of education seekers, the expected result of the innovative educational process is achieved with the help of clearly planned educational goals;
- Interactive methods, forms, and techniques, with the help of which the active activity of those seeking higher education is stimulated, and training is organized;
- Structured and specially selected training content;
- Adequacy to the forms, goals, means, and methods of education;
- Psychological, pedagogical, and organizational conditions for effective planning and implementation of interactive technologies in an innovative educational environment;
- Educational and mental procedures and actions in the form of a system of cognitive tasks to achieve the planned results.

The main pedagogical idea of using interactive technologies in an innovative educational environment is the actualization of basic knowledge, the activation of the mental activity of students of higher education, the provision of an opportunity to independently understand the meaning for the practical use of acquired knowledge, the cultivation of a positive attitude towards the subject, the individualization of the educational process.

Interactive learning technologies in an innovative educational environment provide for the organization of cooperative learning, when each member of the group makes a unique contribution to common achievements, turning into group individual tasks, the efforts of each member of the group are necessary for the success of the entire group. The skillful use of interactive technologies in an innovative educational environment makes it possible to change the forms of habitual activity, relieve nervous tension, and focus on the main problems that require priority attention.

Let's consider the main requirements in the mode of interactive technology for successful education of students in higher education:

- 1) Group members staying in close contact with each other – unmediated interaction;
- 2) Understanding by group members that it is a joint educational activity that benefits everyone – a positive relationship;
- 3) Students of higher education learn skills of interpersonal relations, which are important for successful and interesting work, for example, planning tasks and their distribution – development of teamwork skills;



- 4) Mastering the proposed material in the mode of interactive technology by each student of higher education for successful learning and at the same time being responsible for helping others, but not doing work for someone – individual responsibility;
- 5) It is necessary to allocate a special time during group work so that the group can evaluate how successfully it works in the mode of interactive technology – evaluation of work (Volkova, 2018).

Types of active methods in the mode of interactive technology for successful learning.

Introductory methods. Introductory methods in the mode of interactive technology make it possible to create an atmosphere of trust and goodwill for successful learning. The preliminary meeting takes place in the introductory part with the trainer, the tasks, and the purpose of the training, an introduction is made between the participants of education in the mode of interactive technology for successful training, the rules of the training, and a survey of their expectations. Introductory methods offer "warm-up" exercises (icebreaking), exercises that unite and adjust the group to cooperation and a friendly atmosphere. In the format of such exercises, acquaintance takes place, and expectations are gathered.

Key methods are those that offer a solution to the main problem of the training or class. It can be interactive lectures, discussions, role-playing games, brainstorming, "carousel", cases, etc. It is important to alternate different types of key methods during the main part of the training or class – for successful training, for each subsequent stage of work, select a new method in the mode of interactive technology appropriate to the task. It is worth highlighting the rights to problematization among the key methods. Their purpose is to emphasize the ambiguity and actualize the experience of the participants regarding this problem, the relevance of the solution, and the complexity of the problem to increase cognitive interest in the raised topic. Part of the problematization function is solved by the parallel recording on the flip chart and the collection of expectations from the participants of the training in the mode of interactive technology. It can also be experiments, business games, or cases that emphasize the problem and "expose" the problem.

The final methods combine the results into a general structure, sum up the training session in the mode of interactive technology, and help to highlight the main results of interactive work for successful training. At the final stage of the training or class in the mode of interactive technology for successful learning, the following occurs:

1. Participants analyze the role of interactive technologies: what benefited each of them in the session or training in the mode of interactive technology, what was lacking, and what seemed useful in the work of the entire training group;
2. Feedback from training participants to each other: what helps each of them in successful learning, effective communication, and what hinders working in the mode of interactive technology (what personal qualities, skills, etc.);
3. Ensuring that each participant and the group as a whole receive the main requirements in the mode of interactive technology to successfully learn individualized and generalized information about the possibilities of continuing and the effectiveness of such work, working out in practice the options for applying the obtained results (Sovhira et al., 2023).

Auxiliary methods – attention-enhancing techniques or energizers are used in cases of:

- Before moving from one stage to another or changing activities;
- When there is a need to increase the emotional tone and energy in the group or relieve tension;
- Mandatory – before starting work and after a break.

Auxiliary methods in the mode of interactive technology set up productive cooperation and unite for successful learning. There should not be many of them, but their use is mandatory if the effectiveness of the group's work decreases due to the monotony of tasks, lack of attention, fatigue, and intensive or long-term intellectual activity (Yermolenko, 2022).



The use of interactions in the mode of interactive technology for successful learning and stimulating the natural activity of students.

Learning is not only the content, thanks to which the participants of the educational process in the mode of interactive technology acquire knowledge and skills, but also the process that, with the aim of successful learning and stimulating the natural activity of students, can make this path easier for them. The use of interactive methods in the mode of interactive technology will be successful only when a correspondingly friendly atmosphere is created. Therefore, to successfully study and stimulate the natural activity of students, integration games are an integral element of every innovative class and training.

In the mode of interactive technology, for successful learning, it is necessary to use interactions, which determine the interactivity of the educational process and are aimed at stimulating the natural activity of students, namely:

- **Emotional** – is implemented in the formation of self-confidence, the appearance of emotional tension, and experiences;
- **Mental** – is reflected in the generation of ideas, the intensity of logical thinking, designing, revealing creative imagination, constructing, expressing assumptions, research, modeling, performing analytical and synthetic operations, concentration, observation, attention;
- **Activity in practical independent activity** – as a result – when performing professional functions, and first in the conditions of training;
- **Social** – consists of the exchange of opinions, personal attitude to facts, imitation of the performance of social roles, in own conclusions and judgments, based on critical thinking attitude to activities and phenomena, in the formation of communicative competence, humanistic values.

All the mentioned factors in the mode of interactive technology to reveal the natural activity of the individual encourage students to form a professional mentality, self-determination, personal development, social identification, and personalization, which is of particular significance for specialists who are constantly in interpersonal interaction with clients in the process of professional activity.

Interactive learning, which has an integrative character, incorporates elements of innovation based on enhanced interpersonal interaction aimed at successful learning and stimulation of the natural activity of students, activation of independent, educational, cognitive, and communicative activity, characterizes it as an innovative process in higher education and determines the main direction pedagogical transformations (Kozmenko et al., 2022).

Creating an innovative educational environment of a higher education institution using interactive technology.

Innovative updating of the educational system in the mode of interactive technology ensures the growth of personal potential as teachers and students of higher education promote the expression of individuality and self-improvement. In the mode of interactive technology, the teacher must possess teaching methods, know his subject, orient himself in modern social and political life, and have knowledge in related scientific fields. Taking into account the specifics of educational activity, the specifics of the professional training system of competitive specialists, the content of teacher training for innovative pedagogical activity, the specifics of becoming a teacher as a subject of innovative activity, the creation of an innovative educational environment of a higher education institution for successful teaching students and stimulating their natural activity. Such an educational environment of a higher school should be built with the help of forming the image of "I am a future competitive specialist", on the assimilation of innovative professional activity of the individual, on self-knowledge as an individual, the ability of the individual in professional activity, understanding of the intellectual and spiritual foundations of success. The growth of the personal potential of the higher school teacher will ensure successful learning and stimulation of the natural activity of students in the mode of interactive technology, innovative renewal of the entire educational system, and will contribute to the self-improvement of all participants in the educational process.



Innovative learning in the mode of interactive technology in higher education encourages students in all types of educational activities to an active position, initiative, development of abilities, creative approach, associative thinking; involves the independent creation, acquisition, construction of competencies, skills, and knowledge, which significantly increases the success of education and stimulation of the natural activity of students, the effectiveness of professional training; increases the need for self-improvement and artistic and creative self-realization; engages students in creativity; reveals natural data laid down by nature; develops creative activity; produces aesthetic taste; forms artistic thinking.

Innovative learning in the mode of interactive technology contributes to the formation of the ability to independently analyze and evaluate information, a more conscious and significantly deeper understanding of the essence of what is learned, to defend one's point of view with arguments, formulate conclusions, respect an alternative opinion, listen to others, build constructive relationships with its members and determine one's place in the team, work in a team. This makes it possible for all participants of the educational process to realize the idea of cooperation, contributes to providing an atmosphere of psychological comfort, and teaches them constructive interaction. The organization of such training in the mode of interactive technology involves the systematic application of specific technologies, methods that implement successful training, and stimulation of the natural activity of students with the help of these approaches (Yakymenko et al., 2023).

We recommend the following most effective technologies in the interactivity mode, with the aim of successful learning and stimulating the natural activity of students:

- Project-based, which involves individual, independent, and group activities of higher education seekers;
- Development of student's critical thinking, which in the mode of interactive technology helps to stimulate students' natural activity;
- Cooperative learning – grouping of students into small groups with a common educational goal;
- Situational learning – involves students' comprehension of a real-life situation in the mode of interactive technology;
- An educational process using discussions and debates;
- Game, embodied in the mode of interactive technology in various didactic games.

Using role-playing games and modeling life situations based on the analysis of the relevant situation and circumstances, students come to a joint solution of problems. Interactive learning with the aim of competitiveness and stimulation of the natural activity of students contributes to the creation of an atmosphere of cooperation and interaction, the development of values, and the formation of a complex of skills and abilities (Marrero-Sánchez & Vergara-Romero, 2023).

The organization of innovative learning in the mode of interactive technology with the aim of successful learning and stimulating the natural activity of students is significantly more difficult than the traditional one, but its educational results are significantly higher. The successful implementation of the use of interactive technologies in an innovative educational environment requires systematic work, during which it is necessary to:

- To relieve the burden and focus on the professional direction of specialists, review the content of education with the implementation of the use of interactive technologies in an innovative educational environment in the conditions of innovative learning;
- Implement a set of measures for the use of interactive technologies regarding the lack of alternatives to innovative learning in an innovative educational environment to reorient pedagogical consciousness;
- To develop didactic and methodical provision of interactive technologies in an innovative educational environment, implementing ideas in a new generation of textbooks and manuals;



- Review the content in educational institutions and the focus of training on the use of interactive technologies in an innovative educational environment, as well as in the system of postgraduate education to form the readiness of teachers to work in an innovative educational environment;
- To introduce a system of incentives for teachers who use interactive technologies in an innovative educational environment and implement innovative learning ideas in their practical activities.

It is important that the nature of innovations, in particular, the use of interactive technologies in an innovative educational environment, reflects the needs of students, the training of specialists, and social requirements, taking into account the specifics of a specific institution of higher education. The innovative activity itself through the use of interactive technologies in the innovative educational environment of a higher school requires proper organizational work: analysis and practical verification of interactive methods by competent experts, which are used during the educational process: collection, accumulation, use, systematization and processing of information about innovations; determination of the mechanism of practical implementation of innovative processes and their resource justification; development of provisions, programs, projects regarding the definition of the control system and implementation of innovative processes, their evaluation according to the specified criteria.

Describing the content of innovation and the ways of using interactive technologies in the innovative educational environment of a higher school, it is necessary to take into account the basic managerial actions, which include the functions of coordination, forecasting, analysis, organization and planning, and control. All these processes need to be updated through the use of interactive technologies for the scientific and methodological support of student training in an innovative educational environment of a higher school then the indicator of the quality of innovation will be an increase in the effectiveness of educational activities through the use of interactive technologies of an innovative educational environment of a higher school.

The innovative function of university education based on images of innovative activity ensures the disclosure of creative possibilities of the socio-cultural mechanism through the use of interactive technologies in the innovative educational environment of a higher school and the development of new types of behavior of students of higher education.

The training of future specialists through the use of interactive technologies in the innovative educational environment of a higher school should be considered as a system that is holistic and is built on competence, phenomenological, cultural, systemic, innovative, axiological, personally oriented, contextual, humanistic, acmeological, creative approaches, organic combination of innovative and traditional methods, forms, means of education.

In the training of future specialists, in connection with the transition to the competence approach, there is a need to change the forms, technologies, and methods of conducting classes, which allows avoiding the consequences of inconsistency in education, which do not ensure the practical and effective preparation of specialists. This activates the use of interactive technologies in the innovative educational environment of the higher school, which means fundamental changes in the educational process. The conceptual principles of training future specialists through the use of interactive technologies in the innovative educational environment of a higher school is a dynamic, complex system of theoretical, methodical, and methodological measures aimed at improving the values, content, and norms of a specialist's professional activity (Drozich et al., 2023).

When creating an innovative educational environment of a higher education institution in the mode of interactive technology, innovative processes in the education system are implemented as purposeful changes in conditions, goals, means, content, forms of activity, methods that are characterized by a high potential for increasing the efficiency of activities, the novelty in certain areas. In this context, the higher school implements new learning technologies, including project methods, computer and distance learning, and interactive methods.



The leading conceptual idea of training future specialists in the mode of interactive technology of an innovative educational environment of a higher education institution is based on the premise that the professional training of a future specialist should be directed in an innovative educational environment to the formation of the ability for subject-subject interaction in the direction of formation individual readiness for innovative activity (Kolisnyk-Humeniuk, 2018).

Improving the quality of the educational process of the higher school in the mode of interactive technologies.

Interactive technologies, which are developing and emerged on the border of methodology, general innovation, history, and theory, belong to the system of scientific, general, and pedagogical knowledge and are aimed at ensuring the formation of a holistic creative personality, the effectiveness of the learning process, the formation of creative qualities and various methods of creative activity, with to increase the level of professional skill and professional competence. The conditions for the manifestation of creativity are the presence of a creative process, a creative personality, and a creative environment (Budnyk et al., 2022). The use of interactive technologies in an innovative educational environment has a great influence on the personality. In particular, we consider the following to be effective for the manifestation of personal creativity:

- Communication technology – consists of a collective discussion of the problem facilitated discussion with the help of leading questions. The technology of communication is aimed at the development of future specialists' ability to think, carefully observe, and understand the ambiguity of images;
- The technology of creating an "aesthetic field", the basis of which is the relationship between the individualization of education and the aestheticization of the personality, is the unity of the scientific and artistic activity of the future specialist, which makes it possible to improve the creative-active, emotional-sensual, cognitive-worldview spheres of the personality;
- The technology of forming the aesthetic culture of a person as a future specialist, aimed at the formation of an individual's ability to a holistic emotional-sensual and synthetic understanding and perception of objective reality, enables the sequence of implementation of techniques, forms of organization, methods, means, professional activity, as an object and sphere of aesthetic knowledge; acquisition of aesthetic experience; development of the desire for self-expression and creative self-realization in various activities;
- Art therapy – therapeutic technology performs the function of removing mental barriers in education;
- Improvisational technology is used to activate creative abilities and motivate the student to professional creative activity;
- The technology of developing the aesthetic worldview of future specialists represents a holistic process that includes the organization of the entire learning process, formulation of educational goals, provision of conditions for the formation of specific skills and knowledge aimed at achieving competitiveness;
- The technology of developing the creative abilities of future specialists creates an educational space for the student so that he becomes a subject of individuality, self-development and self-improvement, creative activity, and uniqueness;
- The technology of training a future specialist for the organization of creative activity, which is an algorithmized, ordered system of interrelated tasks, goals, techniques, content, forms, and methods of organizing creative activity, forms a system of skills, abilities, and knowledge that make it possible to effectively organize creative activities that contribute to the development of the desire for self-expression and creative self-realization in various types of creative activity (Balalaieva et al., 2023).

The leading feature of these technologies is the focus on the humanization of education and a deep awareness of the "uniqueness of humanity as the highest form of a person's aesthetic attitude to the world; affects the inner world of the individual, awakens the perception of beauty, stimulates the development of imaginative thinking, associative memory, and artistic imagination; creates ample opportunities for the development of interest" (Kolisnyk-Humeniuk, 2018).



Effective interactive technologies in an innovative educational environment include working out discussion questions, for example: "Scale of opinions", "Continuum", "PRESS method", "Change position", "Take a position", and others. Discussion technologies ensure that students of higher education practice the skills that contribute to human development:

- Listen and, at the same time, hear the opinions of others;
- Clearly express and defend one's opinion;
- To logically argue and substantiate one's position.

Technologies for working out debatable issues contribute to the development of a person's critical and creative thinking, the expansion of the cultural worldview, and the motivation to study students of higher education (Demyanchuk & Adamovych, 2020).

The use of interactive technologies in institutions of higher education during classes promotes the activation of thinking, attention, perception, imagination, creative abilities, memory, and cognitive interests, which ensures the active development of the cognitive interest of the individual is a priority goal of the educational process and increases the success of studies, ensures physiological, intellectual full development of a person. So, we are sure that the use of interactive technologies in higher education helps to form a new style of team relations in future specialists when the transfer of information goes from everyone to everyone and not from one person to many (Kolisnyk-Humeniuk, 2018).

Stages of development of interactive learning technology in an innovative educational environment of a higher school.

The development of interactive learning technology in the educational process of a higher school takes place in the following stages:

1. The preparatory stage provides forecasting and planning of results where the student has the opportunity to obtain information about the term of study, expectations, study goals, experience, needs, educational opportunities; determine learning outcomes, personality qualities, skills, specific knowledge, skills, advancement in competence; shows the sequence and content of the presentation of the educational material, its required volume; distributes educational material to educational modules; formulates and defines learning outcomes in the form of formed competencies for each educational module; carries out in each educational module the selection of active methods, forms, technologies, methods, and methods of learning in such a way that they ensure the development of the student's relevant competencies.
2. The implementation stage creates conditions for organizing the functioning of the technological chain. The planned number of lessons at this stage is carried out consistently according to the following structure: the message of the educational problem, the topics, as a rule, go beyond the boundaries of one subject (it is often necessary to involve the skills to solve a real problem, knowledge of phenomena, concepts related to different educational disciplines), which requires the student to have practical knowledge of the appropriate scientific breadth. When setting an educational problem, it is necessary to take into account the previous training and experience of students to know the gaps in their knowledge. Consideration of educational problems that arise from the experience and needs of students themselves has the greatest effect on student education. At this stage, it is necessary to foresee the didactic workload of students at the expense of organization of activities by elements and as a whole (demonstration, explanation); organization with constant feedback of independent practice and a positive assessment of the teacher, organization of practice in simplified conditions of the student's skills. At this stage, there is a need to transition to productive, exploratory educational activities, during which active methods and forms of learning are used: solving specific problems in small groups, analyzing problem situations, simulation modeling, discussions, business games, etc., and the organization of activity analysis becomes important of the student by the group and the teacher, as well as self-analysis by the student of his own activity during training. In this process, the self-analysis and analysis procedure is aimed at evaluating the competencies acquired by students



(planned in this educational module as a learning outcome). Adjustments are being made to the technological chain – a further learning process; quality deviations from the desired level of professional competencies obtained by students are analyzed, and corrections are made in the learning process (Knysh et al., 2023).

Let's consider how the technological chain functions. By the technological card (plan), the leader of the educational process introduces certain elements at the scheduled time (learning aids, students, himself, etc.), which, according to their functions, begin to perform certain actions. The transition from one stage of the lesson to another, or one operation to another, or the execution of planned actions is controlled and coordinated by the head of the educational process. The head of the educational process receives, sends, and processes information, which allows him during the educational process to know what is happening at each stage of the technological chain and makes it possible to make timely corrections if necessary. Each action of each element is aimed at obtaining the planned result, which in its totality forms the final result in the educational process. With the results obtained, the students move on to the next lesson or the next operation, where, in the process of incorporating the technology, their competence begins to "increase" again.

When organizing training based on interactive technologies in an innovative educational environment, each participant in the educational process performs certain functions since there can be no redundant elements in the technological chain. In interactive technology in an innovative educational environment, all actions are subject to a goal, and each element is important and aimed at achieving the planned result. In addition to active participants in the educational process (students, teacher), "passive" elements in the technological chain (methods, methods, means, sources of learning) are involved, which perform their functions. In the educational process, there is a systematic organization of the interaction of all elements within the limits of interactive technology, which guarantees the achievement of the set learning goals in an innovative educational environment.

3. The stage of summarizing the results of the training includes the analysis of the achievement of the training goals with the help of the inclusion of interactive technology in the innovative educational environment. At this stage, the most important thing for the student is the analysis of the level of relevance of the acquired skills and knowledge, which allows you to effectively use the acquired knowledge in professional activities and your life (Sysoieva, 2011).

The influence of the active implementation of information and communication technologies, modern digital tools, and new technological means of learning on the possibilities of using interactive technologies in an innovative educational environment.

The active implementation of information and communication technologies in all spheres of human activity, in the innovative educational environment, and in the entire process of computerization of modern society requires updating approaches and fundamental changes to the training of competitive personnel. This is due to the need for innovative training of a generation of new specialists capable of competently and quickly applying the results of scientific and technical progress in professional and educational activities, in particular, the Internet, web technologies, smartphones, digital educational platforms, cloud services, electronic educational resources, artificial intelligence and other modern devices (Shetelya et al., 2023).

The use of interactive technologies in an innovative educational environment is implemented with the help of computer-centric unique learning technologies – these are case technologies, network technologies, etc. The key features of innovative learning are the use of various means for the exchange of educational information; the provision of two-way communication between the participants of the educational process, etc.

The improvement of the educational process in institutions of higher education has led to the emergence of new technological means of learning, in particular, tablets, dynamic visualization technologies, smart



boards, mobile devices, MOOCs (Massive Open Online Courses), laptops, virtual laboratories, etc. In higher education, the use of distance learning platforms is becoming more and more common and popular. Innovative technologies bring learning to a new, fundamental, high-quality level of education (Plakhotnik et al., 2023).

We emphasize the expediency of using augmented and virtual reality applications in an innovative educational environment. Let's consider the applications of augmented and virtual reality, which should be supported in the process of project training of future specialists (Kovalenko et al., 2021):

1. **Google Expeditions** is a tool for the educational process that allows you to explore objects in augmented reality and travel through the virtual world. The application contains modes of research at the level of atoms of objects, the study of historical monuments, etc. The teacher becomes a guide in Google Expeditions, who "walks" with a group of higher education students on a video excursion, showing objects of augmented reality. This technology serves for the detailed study of individual subjects and allows the use of special tools.
2. **EON-XR** is a virtual or augmented reality program designed for learning in a practical environment. In the mode of virtual reality, classes can be held both in groups and individually, providing all the requirements of an innovative educational environment. Using the EON Reality library of over 1 million pieces of digital data on their phones, computers, tablets, and headsets, EON-XR enables users to quickly create engaging content.

Modernity requires humanity to master the basic forms of online communication: forums, meetings, blogs, chats, e-mails, etc. The innovative educational environment of the higher school is no exception.

Mobile communication services (Viber), instant messaging services, and social networks allow you to create communities and chats, private groups for discussing tasks, questions, topics, and information. Video conferences can be held via Skype, Zoom, Google Meet, or Microsoft Teams. The advantage of applications is the possibility of use for group and individual work, installation, and use on laptops, computers, smartphones, and tablets (Stratan-Artyshkova et al., 2022).

With the Zoom platform, you can send meeting IDs and links, organize recurring and new scheduled meetings, use chats and waiting rooms for individual work, use screen demonstrations, meeting recording functions, and interactive whiteboards.

Let's emphasize the importance of the platform for innovative learning – Google Drive, cloud storage for saving and searching for various types of files (lectures, presentations, laboratory instructions, popular science films, electronic versions of methodical and scientific literature, self-produced screencasts, etc.).

Let's consider the Google tools that are important for working in the innovative educational environment of a higher school, namely the Google Classroom Learning Management System, which allows you to evaluate and publish assignments, create audiences, communicate with students, distribute and store educational materials, and post announcements. The teacher can see who continues to work on the task and who has completed it and read the comments and questions of students.

The Google Classroom mobile application allows teachers and students to create charts or graphs without an Internet connection and provides access to assignments in offline mode in the Google Classroom mobile application.

In an innovative educational environment, the following functions can be used using Google Apps:

- Communication of students from any place with each other – formation of channels of live information;
- Organization for work on the project of an innovative information space for all participants, where access to information is provided in a free form;
- Ensuring comfort and convenience in using programs;



- Provision of access to information for project participants;
- Ensuring the security of cloud storage of documents;
- Provision for joint work on shared access documents;
- Active networking (creation of conditions for teamwork) of all project participants;
- For discussion and problem solving – creation of temporary groups at a time convenient for group members;
- Timely notification of events and availability of plans;
- Quick feedback (Sulym et al., 2023).

Personalized search in an innovative educational environment is provided by Google programs:

- **Google Search** allows you to instantly find interesting news, get answers to questions, get information about important updates;
- **Google News**, taking into account the interests of the user, provides a selection of information and helps to learn about events around the world.

Google applications also relate to the organization of work in an innovative educational environment:

- **Google Disc** allows you to place files of various types (has data storage): graphics, text, audio, video, photos, presentations, etc.;
- **Google Sheets** allows you to visualize and analyze data.
- **Google Slides** has many fonts, themes, animations, embedded videos, and other tools; it is possible to view and edit presentations on innovative devices – tablet, phone, and computer even without an Internet connection;
- **Google Calendar** is a service for planning events, meetings, and affairs, which allows you to plan your time and allocate it effectively, which is important for a modern person (Rebukha, 2022).

Experimental research.

A key point in the innovative educational environment of training specialists to solve ways of using interactive technologies to modernize the professional activity of specialists is the rejection of usual stereotypes and mastering of methods of innovative activity and ineffective methods of professional activity. The use of the latest approaches without the individual's desire for change, without reorientation to an innovative approach, will not give the expected results since modern society is characterized by the rapid development of fine and high technologies, in particular in the field of education.

During the experimental work, we created a program for the use of interactive technologies in an innovative educational environment of a higher school, where we involved all members of the teaching staff in the processes of change, which contributed to the realization of the main tasks of personality development. The unification of future specialists around a common goal gave special importance to joint creative work, increased the motivation of their activities, and united the collective to innovative activities in a team with the transition to the reformist positions of reform participants from narrow-profile views on their professional training.

Research and experimental work showed that the leading role in the implementation of innovations aimed at the formation of a creative personality and the development of its individuality is performed by the teacher at the level of an educational institution, under whose leadership it is necessary to carry out the process of innovative training of specialists to solve ways of using interactive technologies in innovative modern professional environment. Modern education faces the problem of forming a specialist as a bearer of innovative culture. Such requirements require changes in the system of professional activity of the higher school.



At all stages of experimental work on a scientific and methodological problem, an experimental group of students led by teachers worked creatively. The main requirements that applied to the members of the experimental group of the higher school were creativity, personal interest, voluntariness, and the ability to change the situation. It was the members of the experimental group who developed and selected materials (questionnaires, questionnaires, tests, etc.) for internal monitoring, conducted a systematic analysis of the situation, and implemented strategies for local and modular changes in the program of using interactive technologies in the innovative educational environment of the higher school.

The next step is the transition to the practical actions of evaluating educational results from the theoretical analysis of the problems of improving the quality of education.

Discussion of the results of the pedagogical experiment

We have implemented the methodology of using interactive technologies in the innovative educational environment of a higher school, analyzing and studying the conditions for the formation of an innovative teacher culture. This technique consisted of several questionnaires and tests because it is necessary to have information to monitor all aspects of the educational process:

- To have an idea about the interests and abilities of students, the level of satisfaction with education, the use of interactive technologies in the innovative educational environment of a higher school, and the level of knowledge of higher education students;
- To know the level of professional skill, the state of teaching in the innovative educational environment of the higher school, self-esteem, work efficiency, and the level of methodical culture of the future specialist;
- Have information about yourself: analyze your limitations and evaluate the development of research skills and analytical skills.

158 respondents were diagnosed. During the survey, the level of readiness of students of graduation courses and teachers of a higher education institution to use interactive technologies in an innovative educational environment of a higher school was studied. Respondents were allowed to single out several items of answers during the questionnaire.

The result of involving respondents in the use of interactive technologies in the innovative educational environment of a higher school is, according to the respondents:

- Development of professional qualities of future specialists (83%);
- Enrichment of future specialists with professional knowledge (72.4%);
- Personality development of the future specialist (59%);
- Acquisition of a modern, innovative style of personal thinking (46.2%);
- The dynamics of academic achievements of students (32.1%);
- The success rate of graduates of higher education institutions (31.9%).
- Needs in pedagogical creativity of the future specialist (28.7%),
- Needs for publication of one's methodical assets (9.3%).

Questionnaire questions were offered to EC and CG respondents. The following answers were received. In response to the question "*Are you interested in experiments and innovations in professional activity?*" got the following results:

- 91% of respondents said "yes"
- 9% of respondents said "no".



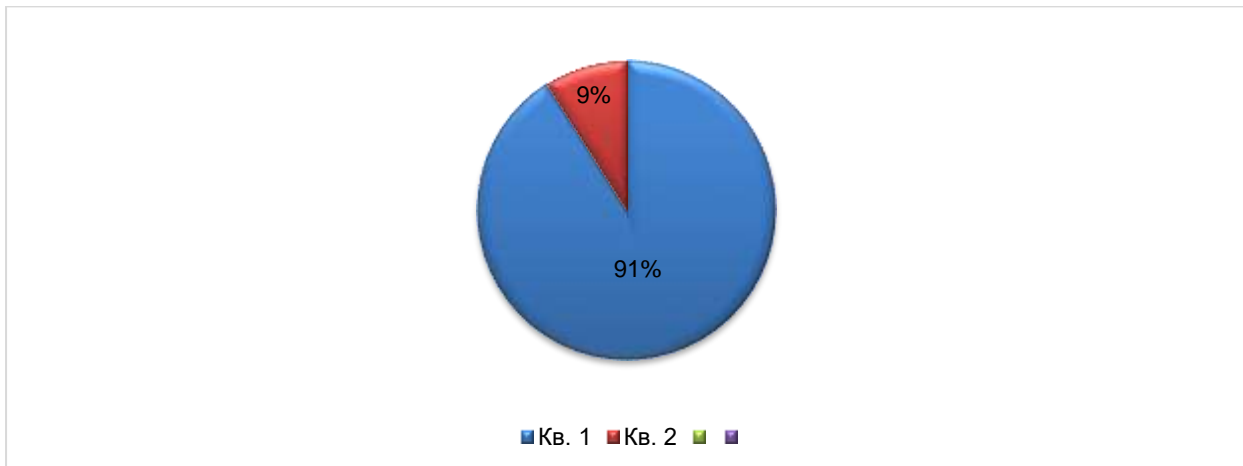


Fig. 1. Results answer to the question "Are you interested in experiments and innovations in professional activity?"

This means that a small part of specialists do not have personal sustainable motivation.

The answers to the question "*How often do you use interactive technologies in your work during the year?*" were distributed as follows:

- 19% of respondents will use interactive technologies in their work – 150-180 times during the year;
- 55% of respondents – 100–150 times during the year;
- 26% of respondents used interactive technologies in their work 80–100 times a year.

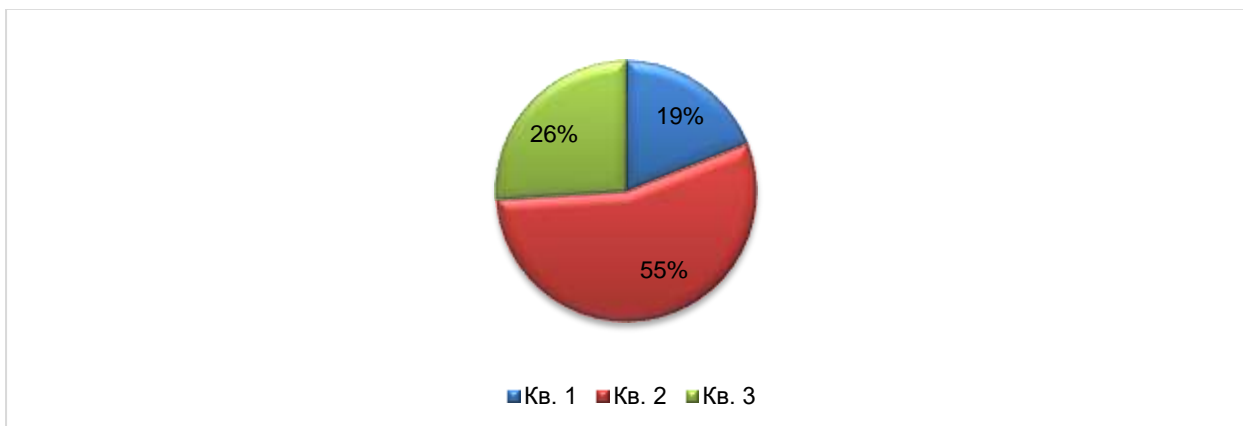


Fig. 2. Results answer to the question "*How often do you use interactive technologies in your work during the year?*"

The answers to the questions indicate the readiness of specialists for innovative activities.

The next question was – "*What is attractive to you about innovative activity, in particular, interactive technologies?*"

The respondents chose the following answer options to the question:

- 78% – develops a person's interest in studying the material;
- 65% – the opportunity to implement new forms of work and methods.

The next question: "*Name the main reasons that inhibit the introduction of new interactive technologies.*" The following answers were received.

- 89% lack of time;
- 35% oversaturation of the material;
- 26% have imperfect computer skills;
- 21% poor financial support;
- 14% psychological unpreparedness of students to perceive information;
- 8% conservatism in education.

The next question: "*Name the main internal contradictions that inhibit the use of interactive technologies in the innovative educational environment of a higher school?*"

Respondents consider the following to be the main internal contradictions:

- 37% – lack of confidence in a positive result;
- 21% – uncertainty as to whether I will be able to be successful in experimental or innovative work;
- 19% – there is no certainty that the new will be better than the old;
- 11% – no one pays attention to the additional loss of strength and time to work in a new way;
- 30% of respondents did not answer.

We see that the respondents are aware of the goals and meaning of innovative activities, but not every respondent can confidently engage in innovative activities.

Answers to the question "*Choose innovative diagnostic techniques that you are fluent in?*" were important. The answers were distributed as follows:

- 85% – desire to learn new things when using interactive technologies;
- 71% – desire to experiment when using interactive technologies;
- 65% – creativity;
- 42% – previous experience in the implementation of interactive technologies in the innovative space of a higher school.

To the question "*What do you consider the main component of success?*" school teachers answered as follows:

- 85% – self-confidence in self-improvement throughout life;
- 79% – use of interactive technologies in an innovative environment;
- 59% – creativity, perseverance, innovativeness;
- 39% – searching for and introducing novelty into a professional career.

We see that only persistent, innovative, creative individuals can be carriers of innovations, capable of self-development, reflection, self-actualization, professional self-improvement, and self-confidence.

The implementation of interactive technologies in the innovative space of a higher school forms the innovative position of a specialist and contributes to the readiness of future specialists for innovative activities during their lifetime.

The last question for the perspective of our activity was as follows: "*What innovative technologies, interactive technologies, or methods would you like to master in more detail for your professional work?*".



Among those named were: "Project activity", "Cloud technologies", "Methods of critical thinking", etc. The conducted analysis of the study claims that the respondents consider themselves motivated to innovative activity, participate in it.

For us to be able to show the importance of the use of interactive technologies in an innovative educational environment, we conducted a study that revealed the essence of the concept of "interactivity", found out the criteria for the effectiveness of interactive technologies in the educational field, singled out and showed the advantages of the elements of interactive technologies, proposed the development of practical aspects of use in the educational process of interactive technologies.

The conclusions we obtained during the research are relevant for the field of research because modern science is characterized by the search for interactive technologies, the creation of conditions – innovations aimed at the development and formation of a complete, free, creative, competitive personality, capable of adaptation, socialization, self-realization in society, and also creates conditions for revealing the essence of innovative approaches in the educational process. New requirements for the content, organization of the learning process, and the entire educational environment shape modernity, changing the essence of education and its results. Interactive technologies make it possible to make the educational process more interesting and active, based on the personal expression of education seekers and teachers and their active interaction.

Recommendations on research results.

Taking into account the results of the research, we concluded that future specialists must comply with the requirements for their competitiveness, namely:

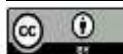
- To determine the criteria for the effectiveness of innovative professional methods, the use of interactive technologies to modernize the training of future specialists, which reflects an activity approach;
- Choose interactive methods that are optimal for lifelong learning;
- Take into account the high efficiency of interactive interaction in practice;
- Use only interactive technologies that will meet the tasks and set goals for the personal development of future specialists;
- Subject to the availability and systematic use of interactive technologies;
- Take into account the developmental nature of interactive methods.

It is these directions in the conditions of interactive learning that determine the strategy of building a modern system of professional training of specialists and creating a complex of optimal conditions for self-realization and self-development of students.

Conclusions

The content and system of interactive technologies in an innovative educational environment are analyzed, the components of interactive technology are justified, and the main pedagogical idea and the main requirements in the mode of interactive technology for successful learning are revealed.

In the article, we show the importance of using interactive technologies in an innovative educational environment. Research and experimental work showed that the leading role in the implementation of innovations aimed at the formation of a creative personality and the development of its individuality is performed by the teacher at the level of an educational institution, under whose leadership it is necessary to carry out the process of innovative training of specialists to solve ways of using interactive technologies in an innovative modern professional environment.



The implementation of interactive technologies in the innovative space of a higher school forms the innovative position of a specialist and contributes to the readiness of future specialists for innovative activities during their lifetime.

The perspective of further research is the study of such issues as the study and implementation of foreign experience in the use of modern interactive learning technologies.

The practical significance of the research lies in the improvement of the educational process aimed at the formation of creative skills through the use of interactive technologies: creating products of creative activity; problematic vision; for the development of imagination and fantasy; thinking activity; original, non-standard ideas.

The content and results of the experimental research can be used by teachers to improve the educational process of training future teachers for the use of interactive pedagogical technologies in their professional activities.

The main contribution of the research to the field of innovative education is the expediency of using interactive pedagogical technologies in the educational process of higher education institutions.

Recommendations regarding the use of interactive technologies in professional activities are defined: this is constant professional self-development and self-improvement in the conditions of research of advanced progressive achievements in the field of new technologies, as well as the introduction of new innovative technologies and teaching methods; participation in international and all-Ukrainian projects, training to improve professional qualifications; use of innovative methods and information and communication technologies, forms of training organization in professional and teaching activities; encouraging students of higher education to engage in scientific research, to participate in various projects and training aimed at professional development.

Bibliographic References

- Balalaieva, O., Mochan, T., Hryhorenko, T., Andreikova, I., Paltseva, V., & Podkovyoff, N. (2023). Innovative pedagogical technologies – the most important resource in modernizing the training of a modern specialist. *Amazonia Investiga*, 12(63), 67-76. <https://doi.org/10.34069/AI/2023.63.03.6>
- Budnyk, O., Rembierz, M., Arbeláez-Encarnación, T. F., Rojas-Bahamón, M. J., Arbeláez-Campillo, D. F., Chinchoy, A., & Matveieva, N. (2022). Formation of tolerance in the inclusive environment of an educational institution. *Amazonia Investiga*, 11(56), 305-319. <https://doi.org/10.34069/AI/2022.56.08.29>
- Demyanchuk, O., & Adamovych, I. (2020). Theoretical basis of using interactive technologies in the educational process. *Scientific Bulletin of Uzhhorod University. Series: «Pedagogy. Social Work»*, 1(46), 160-163. <https://doi.org/10.24144/2524-0609.2020.46.160-163>
- Drozich, I., Drobin, A., Skrypka, I., Mamchych, O., Mykhailenko, O., & Kurach, M. (2023). The role of education in the innovative society. *Amazonia Investiga*, 12(64), 45-56. <https://doi.org/10.34069/AI/2023.64.04.4>
- Khomyuk, I. V., Petruk, V. A., Holiuk, O. A., & Khomyuk, V. V. (2020). *Innovative technologies in the educational process: Monograph*. Vinnytsia: VNTU. <https://ir.lib.vntu.edu.ua/bitstream/handle/123456789/33832/Інноваційні%20технології%20в%20освітньому%20процесі.pdf?sequence=3&isAllowed=y>
- Knysh, I., Budanova, O., Vakulenko, S., Syrotina, O., & Popychenko, S. (2023). Innovative educational technologies as a way of higher education enhancement. *Amazonia Investiga*, 12(68), 21-32. <https://doi.org/10.34069/AI/2023.68.08.2>
- Kolisnyk-Humeniuk, Yu. I. (2018). *Methodical instructions for studying the module "Innovative and interactive learning technologies"*. Lviv: LNNTSPO. <https://acortar.link/C7LpGc>



- Konovalchuk, I. I. (2014). *Theory and technology of implementing innovations in general educational institutions: Monograph*. Zhytomyr: Publication of ZhDU named after I. Franko. <https://core.ac.uk/download/pdf/187726599.pdf>
- Kovalenko, V. V., Marienko, M. V., & Sukhikh, A. S. (2021). Use of augmented and virtual reality tools in a general secondary education institution in the context of blended learning. *Information Technologies and Learning Tools*, 86(6), 70-86. <https://doi.org/10.33407/itlt.v86i6.4664>
- Kozmenko, O., Popovych, I., Arbeláez-Campillo, D.F., Rojas-Bahamón, M.J., & Volchenko, L. (2022). Structural and functional model of the successful person training in USA colleges and universities. *Amazonia Investiga*, 11(55), 143-155. <https://doi.org/10.34069/AI/2022.55.07.15>
- Lalak, N. V. (2011). Interactive model of student learning: Problems and prospects. Scientific Bulletin of the Uzhhorod National University: Series "Pedagogy. *Social Work: A Collection of Scientific Works of ZOIPPO*, (1)27, 69-70. http://nbuv.gov.ua/UJRN/Nvuuped_2011_20_27
- Marrero-Sánchez, O., & Vergara-Romero, A. (2023). Digital competence of the university student. A systematic and bibliographic update. *Amazonia Investiga*, 12(67), 9-18. <https://doi.org/10.34069/AI/2023.67.07.1>
- Plakhotnik, O., Zlatnikov, V., Strazhnikova, I., Bidyuk, N., Shkodyn, A., & Kuchai, O. (2023). Use of information technologies for quality training of future specialists. *Amazonia Investiga*, 12(65), 49-58. <https://doi.org/10.34069/AI/2023.65.05.5>
- Pometun, O. I., & Pyrozhenko, L. V. (2004). *A modern lesson. Interactive learning technologies: Science and method manual*. Kyiv: A.S.K. Publishing House. https://pedagogika.ucoz.ua/knygy/Suchasnyj_urok.pdf
- Rebukha, L. Z. (2022). *Innovative learning technologies in the conditions of modernization of modern education: A monograph*. Ternopil: ZUNU. http://dspace.wunu.edu.ua/bitstream/316497/48105/3/монографія_Інноваційні%20технології%20навчання%20в%20умовах%20модернізації%20сучасної%20освіти.pdf
- Shetelya, N., Oseredchuk, O., Cherkasov, V., Kravchuk, O., Yarova, L., & Kuchai, O. (2023). Competency approach in preparing professionals in an innovative educational environment in higher education. *Revista Conrado*, 19(S3), 298-307. <https://conrado.ucf.edu.cu/index.php/conrado/article/view/3512>
- Sovhira, S., Dushechkina, N., Balokha, A., Borysenko, N., & Ieresko, O. (2023). Ecologization of education in the innovative space of higher education. *Amazonia Investiga*, 12(67), 115-126. <https://doi.org/10.34069/AI/2023.67.07.11>
- Stratan-Artyshkova, T., Kozak, Kh., Syrotina, O., Lisnevskaya, N., Sichkar, S., Pertsov, O., & Kuchai, O. (2022). Formation of New Approaches to the Use of Information Technology and Search for Innovative Methods of Training Specialists within the Pan-European Educational Space. *International Journal of Computer Science and Network Security*, 22(8), 97-104. <https://doi.org/10.22937/IJCSNS.2022.22.8.13>
- Sulym, V., Melnykov, A., Popov, M., Vechirko, O., & Malets, D. (2023). Improving education through implementation of information technologies into the educational process. *Amazonia Investiga*, 12(68), 281-293. <https://doi.org/10.34069/AI/2023.68.08.26>
- Sysoieva, S. O. (2011). *Interactive technologies for teaching adults: Educational methodical guide*. Kyiv: VD "ЕКМО". <https://elibrary.kubg.edu.ua/id/eprint/7101/1/СВІТЛАНА%20СИСОЄВА%20%20ІНТЕРАКТИВНІ%20ТЕХНОЛОГІЇ%20%20НАВЧАННЯ%20ДОРΟΣЛИХ.pdf>
- Volkova, N. P. (2018). *Interactive learning technologies in higher education: Educational and methodological manual*. Dnipro: Alfred Nobel University. https://www.pedagogic-master.com.ua/2022/Volkova_1.pdf
- Yakymenko, S., Vasiutina T., Nefodov, D., Pankiv, L., Stryzhakov, A., & Denysiuk, M. (2023). Main directions of innovative transformations in higher education. *Amazonia Investiga*, 12(63), 31-41. <https://doi.org/10.34069/AI/2023.63.03.3>
- Yermolenko, A. (2022). *Interactive learning technologies: Electronic training course*. Bila Tserkva: BINPO. https://lib.iitta.gov.ua/id/eprint/731177/1/Інтерактивні%20технології%20навчання_ЕНК.pdf




DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.12>

Cómo citar:


Maleiev, O., Kyslyi, V., Prykhodko, D., Babych, A., & Yandola, K. (2024). The role of technology in the development of higher education in Ukraine in the context of global challenges. *Revista Eduweb*, 18(3), 157-166. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.12>

The role of technology in the development of higher education in Ukraine in the context of global challenges


El papel de la tecnología en el desarrollo de la enseñanza superior en Ucrania en el contexto de los retos mundiales

Oleksandr Maleiev <https://orcid.org/0009-0003-2194-9020>
amaleev73@gmail.com


Senior Lecturer, Ivan Kozhedub Kharkiv National Air Force University (KNAFU), Kharkiv, Ukraine.

Vitalii Kyslyi <https://orcid.org/0000-0001-7518-0948>
kisliyv67@gmail.com


PhD., in Psychology, Associate Professor, Professor of Psychology and Pedagogy Department, Ivan Kozhedub Kharkiv National Air Force University, Kharkiv, Ukraine.

Dmytro Prykhodko <https://orcid.org/0000-0002-5774-2692>
d.petrovich7971@gmail.com

PhD., in Psychology, Associate Professor of the Department of Psychology, Pedagogy and Philology, Kharkiv State Academy of Culture, Kharkiv, Ukraine.

Andrii Babych <https://orcid.org/0000-0002-0930-4700>
babich0384@ukr.net

PhD., in Juridical Sciences, Associate Professor, Department of Psychology and Pedagogy, Ivan Kozhedub Kharkiv National Air Force University, Kharkiv, Ukraine.

Krystyna Yandola <https://orcid.org/0000-0002-1040-5381>
yandola-k@ukr.net

Teacher, Department of Psychology and Pedagogy, Ivan Kozhedub Kharkiv National Air Force University, Kharkiv, Ukraine.

Recibido: 24/06/24

Aceptado: 29/08/24

Abstract

The article examines the role of technology in the evolution of higher education in Ukraine, with a particular focus on the challenges posed by global change. The author analyses the impact of digitalisation on the learning process, the organisation of educational activities and the interaction between students and teachers. The article discusses both the positive aspects of the introduction of digital tools, such as increased student engagement, curriculum flexibility and effective management of educational resources, and potential problems, such as technical difficulties, the need to improve the digital literacy of teachers and students, and the possible decline in the quality of education due to the use of low-quality teaching materials. The article is based on an empirical study of the introduction of digital technologies in higher



education institutions, as well as on the results obtained in EU countries in 2022. The practical and theoretical implications of the study are discussed separately. This includes the development of recommendations for the integration of digital technologies into the educational process, as well as the development of educational theory in the context of digitalisation.

Keywords: technological innovation, digital transformation, educational innovation, higher education, smart technologies.

Resumen

El artículo examina el papel de la tecnología en la evolución de la enseñanza superior en Ucrania, con especial atención a los retos que plantea el cambio global. El autor analiza el impacto de la digitalización en el proceso de aprendizaje, la organización de las actividades educativas y la interacción entre estudiantes y profesores. El artículo analiza tanto los aspectos positivos de la introducción de herramientas digitales, como el mayor compromiso de los estudiantes, la flexibilidad de los planes de estudio y la gestión eficaz de los recursos educativos, como los posibles problemas, como las dificultades técnicas, la necesidad de mejorar la alfabetización digital de profesores y estudiantes, y el posible deterioro de la calidad de la enseñanza debido al uso de materiales didácticos de baja calidad. El artículo se basa en un estudio empírico sobre la introducción de las tecnologías digitales en las instituciones de enseñanza superior, así como en los resultados obtenidos en los países de la UE en 2022. Las implicaciones prácticas y teóricas del estudio se discuten por separado. Esto incluye la elaboración de recomendaciones para la integración de las tecnologías digitales en el proceso educativo, así como el desarrollo de la teoría educativa en el contexto de la digitalización.

Palabras clave: innovación tecnológica, transformación digital, innovación educativa, enseñanza superior, tecnologías inteligentes.

Introduction

Before analysing the processes of transformation of the higher education institution under the influence of technological development, it is important to define what should be understood by the institution of education in general and higher education in particular. The institution of education is the most important social institution that regulates the processes of socialisation of individuals. When we talk about a social institution, it means that roles (mutually typified actions inherent in each role) are distributed among the subjects of relations, which indicate specific actions to actors in certain situations.

Relationships between role holders are regulated by a system of norms and rules that are situated in a cultural and historical context, and the roles themselves serve as models of behaviour. Norms, rules and roles are always linked to a particular situation and cultural context. This means that institutions are not created forever; they change depending on place, time and cultural context. Institutions capture social experience in the memory of society, so that individuals can give meaning to their actions, their biographies, and the actions of others (Byrko et al., 2022).

Education as an institution has its own ideology, rooted in the culture of a particular society. This ideology gives it meaning and determines the direction of educational activities, i.e., determines how and what to teach in order for an individual to be successful, useful to society and socialised. Ideology served as the basis of the conceptual model of education. Previously, higher education was assessed not so much from a pragmatic point of view, as the acquisition of a profitable job, but from the point of view of possessing the highest good, i.e. realising the possibilities of comprehensive and harmonious personal development. Today, the ideology is changing: the pragmatic and social stratification aspects of higher education are becoming more important (Shevchenko, & Dubiaha, 2022).



Institutional analysis includes the study of the current state of the higher education system, its norms, values, rules of interaction between key stakeholders and their roles. Technologicalisation of higher education means the transformation of educational and management processes, as well as everyday social practices, through the introduction of technologies for creating, processing, exchanging and transmitting large amounts of information on electronic media. This process involves the integration of education with information resources. When analysing the digitalisation of higher education, we will focus on how digital tools and technologies change the educational situation, the roles of the main participants in the educational process, the conceptual model of education and the management of educational institutions (Iastremska et al., 2023).

The research focuses on how modern technologies influence the development of higher education in Ukraine, especially in the context of global challenges. The article analyses the changes that have taken place in higher education in Ukraine as a result of the introduction of digital technologies, including the transition to online learning, the use of digital platforms for lectures and seminars, and the introduction of electronic learning management systems.

The purpose of this article is to study and analyse the role of modern technologies in the development of higher education in Ukraine in the context of global challenges.

Theoretical Framework or Literature Review

Theoretical foundations of the study of the introduction of new technologies in the higher education system

The changes in the education system that are taking place under the influence of technology are widely discussed in the scientific literature (Kayumovich, 2024; Palkova & Agapova, 2021). Many articles focus on the benefits of digital technologies used in higher education (Boiko et al., 2024; Skoromnyi et al., 2021). These advantages include: students' access to information resources without restrictions; creation of individualised educational trajectories; transparency of educational organisations; optimisation of interaction between teachers and students, as well as between all participants in the educational process; formation of flexible structures for managing the educational process, etc.

Along with the positive aspects, the literature contains sceptical assessments of the technologicalisation and digitalisation of higher education (Barvinok & Pudło, 2023; Berbets et al., 2021). The challenges faced by the higher education system are discussed: increased competition in the market of educational services due to the emergence of new providers, increased mobility of students, changes in their demands for content, forms and technologies of education, on the one hand, and the inability of universities to master new requirements and fully use the capabilities of digital technologies, on the other (Oharenko et al., 2022; Okanda, 2024).

Attention is also drawn to the increase in fraud and plagiarism due to the expansion of access to information resources of educational organisations (Boiko et al., 2024; Tkachuk et al., 2023). Researchers are seriously concerned about the formalisation of professional training and the decrease in the diversity of graduates' knowledge and competences due to the algorithmisation and standardisation of online education, especially in the case of robotic programs and the lack of direct contact with the teacher and students (Zaitsev, 2023; Opryshko et al., 2024).

At the same time, the main problem with studies analysing the social effects of the technologicalisation of higher education is that they usually assess the technologicalisation of one of the elements. This refers to a change in either the learning paradigm, or the management of educational organisations, or the organisation of the learning process, or communications between the main participants in the educational process. There are virtually no studies that focus on the transformation of this institution under the influence of digitalisation and the associated social risks as a probability of a positive or negative outcome for society and the educational institution itself.



Methodology

Design

The effectiveness of this study is assessed using qualitative and quantitative indicators. During the observations, these indicators are measured, compared and analysed, and then the data are interpreted. The study went through several stages, as shown in Table 1.

Table 1.
Stages of the study

No.	Stage	The period of the event	Content of the research stage
1	Stating.	February 2023	Defining the purpose and objectives of the study. Formation of control and experimental groups of students. Selection of research tools and methods. Conducting primary testing. Checking methods for internal consistency and relevance to the chosen research topic
2	Shaping	September 2023 - March 2024.	Implementation of pedagogical conditions for the use of the latest technologies for students of the experimental group. The pedagogical conditions include: the use of synchronous and asynchronous distance education tools, the use of chatbots, messengers, and other means of digitalising the educational process. At this stage, the academic performance of students and their attitude to the conditions of the educational environment of the university were monitored.
3	Final	April 2024	Processing of research results. Summing up the results.

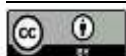
Participants

The study was conducted at the Department of Foreign Languages of the Faculty of Biology and Technology of Sumy National Agrarian University and the Practice of English Language and Methods of Teaching it at the Faculty of Ukrainian and Foreign Philology and Department of Pedagogics and Psychology of Ivan Franko Drohobych State Pedagogical University. The respondents were selected by drawing lots among the students of these departments. Students of the 2nd-4th year of study took part in the research and experimental work. The control group consisted of 68 people, including 35 men and 33 women. The experimental group consisted of 67 people, including 18 men and 49 women.

The age composition of the study groups was the same; both groups studied according to the same educational standard of higher education. In the process of theoretical and practical training, both groups were taught by the same teachers. Students of the experimental group participated in pedagogical conditions of using the latest technologies in education, while students of the control group studied according to the standard methodology. The study also involved an expert group of 9 teachers.

Data collection

1. The Educational Environment Trust Scale (EETS) was developed by researchers at the University of Illinois. The EETS consists of 18 statements designed to assess students' trust in teachers, peers, and the overall educational environment.
2. Using the method of expert assessments, an independent and objective study of the role of smart technologies in stimulating students' motivation to learn a foreign language was conducted. The expert group also analysed the academic performance of students in two groups - with and without the use of smart technologies. The results of the analysis became the basis for identifying the correlation between motivation to learn and the use of smart technologies in the learning process.
3. The European Framework for the Digital Competence of Educators (European Commission, n/d) is a global framework created by the European Commission to define and assess the digital competences required by educators. This tool aims to support teachers in developing their digital skills to effectively use technology in the teaching and learning process. DigCompEdu provides self-assessment tools to



help teachers assess their level of digital skills.

Data análisis

1. The following formula is used to determine the standard deviation (SD) for each group:

$$S = \sqrt{\frac{\sum (X_i - \bar{X})^2}{N-1}}; (1)$$

where X_i is the value of each level, \bar{X} - is the average value, N is the number of observations.

2. The criterion χ^2 is calculated by the formula:

$$\chi^2 = N \cdot [\sum_{j=1}^m \left(\sum_{i=1}^n \frac{x_{ij}^2}{Q_i \cdot R_j} \right) - 1], (2)$$

where N is the total number of students who participated in the formative stage of the pedagogical experiment;

m is the number of possible values of the first feature; n is the number of possible values of the second feature;

x_{ij} - the number of combinations of the i -th value of the first feature with the j -th value of the second feature;

Q_i is the total number of observations of the i -th value of the first feature;

R_j is the total number of observations of the j -th value of the second feature.

Typically, critical values are given for different levels of significance. The probability of error associated with rejecting or not rejecting the null hypothesis is called the significance level. This means that the probability of considering differences to be significant when they are actually random is determined by the significance level. In pedagogical research, a significance level (denoted by α) of 0.05 is usually used, which indicates that the possibility of error should not exceed 5%. This is the level of significance used in this study.

Results and Discussion

Study the impact of technology on the learning environment

The attitude of CG and EG students to the learning environment of the university was studied using the EETS test. The results are presented in the form of a diagram at Fig. 1.

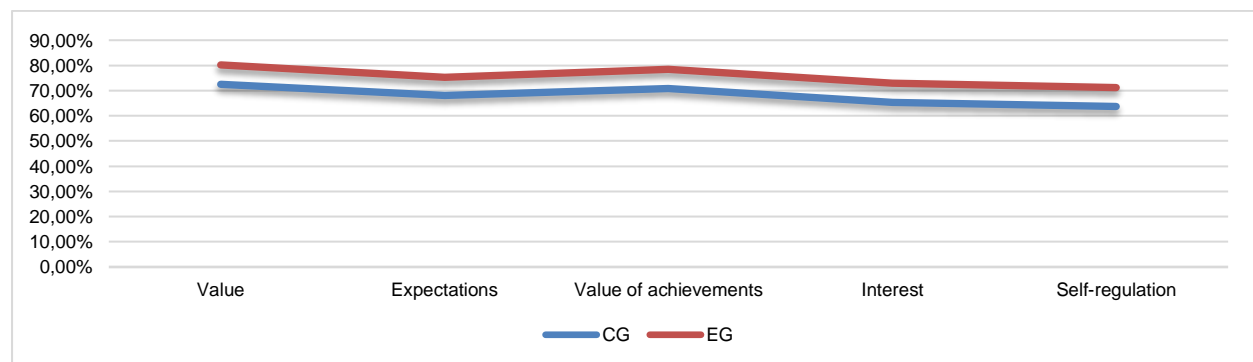


Figure 1. Results of the EETS test for CG and EG.

In the EG, there is a slightly higher level of learning value compared to the CG. This indicates that students who participated in the experiment value learning more, possibly due to new methods or approaches used

during the experiment. The EG also has higher expectations of academic success, indicating greater confidence in their abilities and a more positive perception of the learning process. EG participants attach more importance to their academic achievements, which may indicate that they are more motivated to succeed.

The CG, on the other hand, shows less interest in learning compared to the EG, possibly due to less interesting or outdated methods used in the standard curriculum. EG participants have better skills in self-regulation of learning activities, which indicates that they are more self-disciplined and organised.

These results indicate that the introduction of new methods or approaches may help to improve perceptions of the educational environment. However, more research is needed to confirm these findings and to understand the specific factors that influence perceptions of the educational environment. It is also important to take into account other possible factors that may influence the issue under study. Table 2 shows the dynamics of academic performance of students in both groups.

Table 2.
Dynamics of academic performance of EG and CG students

Group	Success rate	Before the experiment (%)	After the experiment (%)	p-value
EG	High	20.0 (12.5)	40.0 (15.2)	<0.001
EG	Medium	50.0 (16.8)	45.0 (14.7)	0.231
EG	Low	30.0 (15.3)	15.0 (10.8)	<0.001
CG	High	25.0 (13.4)	25.0 (12.9)	0.874
CG	Medium	45.0 (18.1)	45.0 (17.6)	0.954
CG	Low	30.0 (14.2)	30.0 (14.5)	0.921

Table 2 illustrates the dynamics of academic performance of EG and CG students before and after the introduction of pedagogical conditions for the use of innovative technologies. The main trends show significant differences in academic performance between the groups.

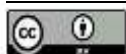
In the EG, there was a significant increase in the proportion of students with a high level of academic performance after the experiment. The indicator increased from 20% to 40%, which is statistically significant ($p < 0.001$). At the same time, there is a significant decrease in the proportion of students with low academic performance, from 30% to 15%, which is also statistically significant ($p < 0.001$). These changes indicate the positive impact of the use of the latest technologies on students' academic achievements. The level of average academic performance in the EG has undergone a slight change, decreasing from 50% to 45%, which is not statistically significant ($p = 0.231$). This indicates that the increase in academic performance was mainly due to the transition of students from low to high levels.

In the CG, academic performance remained virtually unchanged after the experiment. The proportion of students with high academic performance remained at 25%, with no statistically significant changes ($p = 0.874$). Similarly, the proportions of students with average (45%) and low (30%) performance levels remained stable, also without statistically significant changes ($p = 0.954$ and $p = 0.921$, respectively).

The analysis of the results shows that the introduction of the latest technologies in EGs has led to a significant improvement in academic performance, in particular, an increase in the proportion of students with high academic performance and a decrease in the proportion of students with low academic performance. In the CGs where traditional teaching methods were used, no such changes occurred.

Discussion

Not all universities see technologisation and digitalisation as a priority for modernising the educational process. However, they cannot ignore technological progress that promises certain benefits to all



stakeholders. An, Wang, Li, Gan, & Li (2021) believe that the introduction of digital technologies and tools expands the possibilities of using interactive teaching methods and has a positive impact on student engagement in the learning process. As the current study shows, effective technologies include the use of Learning Management Systems (LMS), which facilitate access to learning materials and make the learning process more flexible. This is also confirmed by the results of studies by Bećirović, Brdarević-Čeljo & Delić (2021) and Chen, Zou & Xie (2020). Digital technologies based on artificial intelligence, such as chatbots, are also proving to be very useful in organising the educational process. Deja, Rak, & Bell (2021) describe examples of chatbots in university libraries.

The study showed that students are comfortable using various technological tools. For example, in the Summit Learning project, a chatbot acts as a tutor, engages in a dialogue with each student, and identifies areas where the student is lagging behind (Ervianti et al., 2023). The chatbot then uses this data to create an individualised learning program that focuses on the subjects that cause the most difficulty and tracks student progress from the first to the last lesson.

It is worth noting that the introduction of web-based tools creates new requirements for teachers and students who need to master Web 2.0 tools and develop digital competencies. This is evidenced by the work of Haleem, Javaid, Qadri & Suman (2022). However, the experience of using digital tools in universities in different countries shows that not everyone is ready for such changes. In particular, Humairoh (2023) points out that not everyone takes advantage of, for example, learning management systems (LMS), considering them not a very useful addition to traditional teaching practices.

In addition, the use of these tools in the educational process changes the roles of teachers and students, transforming their relationship and redefining the essence of classroom work. Classroom work is transformed into a discussion platform where students' solutions are discussed, mistakes and omissions are identified, and important aspects of the discipline are conceptualised.

As the results of the current study show, the introduction of digital tools and technologies is changing the educational situation by involving new actors in the process. These actors include software developers, owners of educational platforms, and intermediaries who adapt tools and technologies to the educational process in higher education, as well as help teachers and students to master new technologies. New actors are actively involved in decision-making on the content and organisation of the educational process, partially replacing academic staff. These changes are particularly noticeable in the transition to online education (Klimova et al., 2023).

Online learning based on digital technologies makes the educational process more dynamic, interesting and flexible. Electronic learning materials, such as textbooks, presentations, and video tutorials, can be reused, allowing teachers to save time on classroom preparation and pay more attention to communicating with students. The use of Socrative, Kahoot, Edmodo and Nearpod in the educational process allows teachers to share interactive materials, engage students in discussions and assess assignments in real time.

However, to work effectively with these systems, technical support is required both in the preparation of electronic teaching and learning materials and in the use of Internet resources. This creates a need for specialists or even separate structural units in higher education institutions to provide such support, which complicates the management of the educational organisation.

When considering the intensive development of online education, global social risks should also be taken into account. Competition between online platforms providing online learning services and between universities seeking to expand their influence through online courses leads to duplication of disciplines and learning materials. This can offset the benefits of a networked education model (Ma, 2021). In addition, low-quality learning materials appear in the online space, which sometimes do not meet the minimum requirements of higher education, which carries the risk of lowering the quality of graduates.



Scientific novelty and main limitations of the study

The practical significance of the study lies in the development of recommendations for the integration of digital technologies into the higher education process. The results can be used to develop effective curricula that incorporate new digital tools and technologies, thereby increasing the readiness of teachers to use modern technologies. This will improve the organisation of the learning process through the use of learning management systems (LMS) and other interactive platforms. This will increase students' interest and motivation in learning through the use of interactive methods. In addition, the results of the study will help to create conditions for individualisation of learning, which will allow for more effective adaptation of educational programmes to the specific needs of each student.

The theoretical significance of the study is to deepen the understanding of the impact of technology on the educational process in higher education. The study contributes to the development of educational theory, in particular in terms of the use of digital tools to improve the educational process and increase its efficiency. In addition, the study expands knowledge about the changing roles of teachers and students in the context of digitalisation of education, as well as analyses new forms of interaction and teaching methods. The theoretical conclusions of the study can be used as a basis for further research in the field of pedagogy and educational technologies, as well as for improving educational standards and policies.

The methodological limitations of this study are related to the use of specific methods of data collection and analysis, which may affect the overall validity and reliability of the results. It should be noted that the limited use of only certain quantitative and qualitative methods may lead to an incomplete reflection of the full range of the impact of digital technologies on the educational process. In addition, the subjectivity of teachers' and students' assessments can affect the accuracy of measurements. Instrumental limitations may be related to the use of a limited number of digital tools and technologies in the study. The tools selected for the study may not be equally accessible or familiar to all study participants. This may affect the perception and use of technology. Some tools may have technical limitations that make it difficult to integrate them into the learning process or reduce the effectiveness of their use.

The limitations of the sample are related to the fact that the study was conducted on the basis of specific universities and faculties, which to some extent distorts the generalisation of the results to all other HEIs. The sample consisted of students selected by lot from specific faculties, which may not fully reflect the diversity of the student population. In addition, the number of participants was limited, which may affect the statistical significance of the results. Also, the age and level of training of the students in the sample may also affect the results, as different groups of students may perceive and use digital technologies differently.

Conclusion

The research is driven by the need to meet the growing demand for professionals with innovative skills, including the ability to interact effectively in today's uncertain environment and adapt to various changes. The study examined the interaction between the levels of technologicalisation and students' attitudes towards the educational environment. The findings led to several key conclusions. Digitalisation of the educational process opens up new opportunities to improve learning and optimise its effectiveness. Although not all higher education institutions currently allocate sufficient resources to this area, technological progress is having a profound impact on the education sector, bringing significant benefits to all stakeholders. The introduction of digital technologies, such as learning management systems (LMS) and chatbots, has demonstrated significant benefits.

The use of an LMS facilitates access to learning materials and increases the flexibility of the learning process. Chatbots using artificial intelligence are useful tools for organising the learning process, especially in university libraries. Not only do they make it easier for students to access information and literature, but they also reduce the workload of library staff by automating routine tasks. In addition, chatbots act as virtual consultants, helping to tailor the learning process to the individual needs of students. Summit Learning's



project demonstrates the potential of chatbots as tutors that identify gaps in students' knowledge and develop individualised learning programmes, which can improve academic results. Thus, digital technologies are an important tool for modernising the educational process, improving the quality of education, student engagement and the efficiency of teachers and educational institutions in general.

It is imperative that universities proactively integrate these technologies, adapting them to their specific needs and circumstances, to maximise the benefits of their use. The findings have a wide range of practical applications. In the pedagogical sphere, courses and curricula can be developed that focus on the integrated development of digital and communication skills.

The use of interactive technologies in teaching can have a positive impact on students' digital competence. Future research could be aimed at better understanding and optimising the impact of educational technologisation on the development of students' skills. One of the prospects is to further study the role of interactive and intelligent systems in shaping effective communication between students and teachers.

Bibliographic References

- An, Z., Wang, C., Li, S., Gan, Z., & Li, H. (2021). Technology-assisted self-regulated English language learning: associations with English language self-efficacy, English enjoyment, and learning outcomes. *Frontiers in Psychology*, 11, 558466. <https://doi.org/10.3389/fpsyg.2020.558466>
- Barvinok, V., & Pudło, T. (2023). Formation of online content patterns of higher education based on trends to preserve intellectual capital quality decreasing in Ukraine during wartime. *Business Ethics and Leadership*, 7(2), 109-127. [https://doi.org/10.21272/bel.7\(2\).109-127.2023](https://doi.org/10.21272/bel.7(2).109-127.2023)
- Bećirović, S., Brdarević-Čeljo, A., & Delić, H. (2021). The use of digital technology in foreign language learning. *SN Social Sciences*, 1(10), 1-21. <https://doi.org/10.1007/s43545-021-00254-y>
- Berbets, T., Berbets, V., Babii, I., Chyrva, O., Malykhin, A., Sushentseva, L., Medynskii, S., Riaboshapka, O., Matviichuk, T., Solovyov, V., Maksymchuk, I., & Maksymchuk, B. (2021). Developing independent creativity in pupils: Neuroscientific discourse and Ukraine's experience. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience*, 12(4), 314-328. <https://doi.org/10.18662/brain/12.4/252>
- Boiko, A., Shevtsova, N., Yashanov, S., Tymoshchuk, O., & Parzhnytskyi, V. (2024). The impact of the integration of artificial intelligence on changes in the educational process of Ukraine: prospects and challenges. *Revista Eduweb*, 18(1), 180-189. <https://doi.org/10.46502/issn.1856-7576/2024.18.01.13>
- Byrko, N., Tolchieva, H., Babiak, O., Zamsha, A., Fedorenko, O., & Adamiuk, N. (2022). Training of teachers for the implementation of universal design in educational activities. *AD ALTA: Journal of Interdisciplinary Research, Special Issue 12*, 117-125.
- Chen, X., Zou, D., & Xie, H. (2020). Fifty years of British Journal of Educational Technology: A topic modelling based bibliometric perspective. *British Journal of Educational Technology*, 51(3), 692-708. <https://doi.org/10.1111/bjet.12907>
- Deja, M., Rak, D., & Bell, B. (2021). Digital transformation readiness: perspectives on academia and library outcomes in information literacy. *Journal of Academic Librarianship*, 47(5), 102403. <https://doi.org/10.1016/j.acalib.2021.102403>
- Ervianti, E., Sampelolo, R., & Pratama, M. P. (2023). The influence of digital literacy on student learning. *Klasikal: Journal of Education, Language Teaching and Science*, 5(2), 358-365. <https://doi.org/10.52208/klasikal.v5i2.878>
- European Commission. (n/d). *European framework for the digital competence of educators*. Retrieved from <https://educators-go-digital.jrc.ec.europa.eu>
- Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, 3, 275-285. <https://doi.org/10.1016/j.susoc.2022.05.004>
- Humairoh, M. F. N. (2023). Building undergraduate students' cultural identity through digital storytelling. *Communication Teacher*, 37(3), 235-245. <https://doi.org/10.1080/17404622.2022.2127820>



- lastremska, O., Tryfonova, O., Mantaliuk, O., & Baranets, H. (2023). The impact of strategic decisions on the future development of organisations and economic dynamics. *Future Economics & Law*, 3(4), 117-134. <https://doi.org/10.57125/FEL.2023.12.25.08>
- Kayumovich, B. H. K. (2024). Effectiveness of educational technologies. *City of the Future*, 47, 500-506. Retrieved from <https://miastoprzyszlosci.com.pl/index.php/mp/article/view/3172>
- Klimova, B., Pikhart, M., Polakova, P., Cerna, M., Yayilgan, S. Y., & Shaikh, S. (2023). A systematic review on the use of emerging technologies in teaching English as an applied language at the university level. *Systems*, 11(1), 42. <https://doi.org/10.3390/systems11010042>
- Ma, L. (2021). An immersive context teaching method for college English based on artificial intelligence and machine learning in virtual reality technology. *Mobile Information Systems*, 2021(1), 2637439. <https://doi.org/10.1155/2021/2637439>
- Oharenko, V. M., Pokatayeva, O. V., & Diachenko, M. D. (2022). The management aspect of training future heads of educational institutions for economic activity. *Baltic Journal of Economic Studies*, 8(1), 111-117. <https://doi.org/10.30525/2256-0742/2022-8-1-111-117>
- Okanda, E. O. (2024). Nyerere's philosophy of education for self-reliance and its implications for enhancing the socio-economic dimension of current Kenyan University education: *Future Philosophy*, 3(2), 4-24. <https://doi.org/10.57125/FP.2024.06.30.01>
- Opryshko, N., Novik, K., Smolinska, O., Burmakina, N., & Aizikova, L. (2024). Web-based applications in higher education: revolutionising language learning in the digital age. *Amazonia Investiga*, 13(73), 209-219. <https://doi.org/10.34069/AI/2024.73.01.17>
- Palkova, K., & Agapova, O. (2021). Legal tech in legal education: global perspectives and challenges from the Latvian-Ukrainian experience. *Society. Integration. Education. Proceedings of the International Scientific Conference*, 5, 414-425. <https://doi.org/10.17770/sie2021vol5.6166>
- Shevchenko, Y., & Dubiaha, S. (2022). The impact of inclusive practices on academic performance in primary school. *AD ALTA: Journal of Interdisciplinary Research*, 12(2), 124-127. <http://eprints.mdpu.org.ua/id/eprint/12714/1/124-127.pdf>
- Skoromnyi, V., Voichenko, O., Ostapenko, L., Trynko, O., Shportko, O., & Tishkina, O. (2021). Distance learning in Ukraine: Problems and connection with modern computer technologies. *International Journal of Computer Science and Network Security*, 21(8), 105-110. <https://doi.org/10.22937/IJCSNS.2021.21.8.14>
- Tkachuk, I., Havryshkevych, I., Naida, R., Malazoniia, S., & Hrechanyk, N. (2023). O programma de integração europeia da Ucrânia no contexto da modernização e adaptação da política educativa: Análise do estado atual. *Conhecimento & Diversidade*, 15(38), 461-478. https://revistas.unilasalle.edu.br/index.php/conhecimento_diversidade/article/view/11101
- Zaitsev, S. (2023). Using digital tools to increase the competitiveness of small businesses (experience of full-service bakeries). *Future of Social Sciences*, 1(4), 75-90. <https://doi.org/10.57125/FS.2023.12.20.05>



DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.13>


Cómo citar:

Tytska, Y. (2024). Educational aspect in the legal regulation of scientific research in the constituent instruments of UN Specialized Agencies. *Revista Eduweb*, 18(3), 167-177. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.13>

Educational aspect in the legal regulation of scientific research in the constituent instruments of UN Specialized Agencies

Aspecto educativo en la regulación jurídica de la investigación científica en los instrumentos constitutivos de la Agencia Especializada de la ONU

Yana Tytska

 <https://orcid.org/0009-0003-2194-9020>
yana1maslova@gmail.com

Ph. D., Associate Professor, Dean of the Faculty of Law and Economics of the International Humanitarian University (Odesa, Ukraine).

Recibido: 15/06/24

Aceptado: 18/09/24

Abstract

The aim of the article is to explore how the integration of educational aspects into the legal regulation of scientific research is addressed within the constituent instruments of UN specialized agencies. It seeks to show how education serves as a bridge between scientific advancements and their practical applications, making research more accessible to society. The article identifies a gap in systematic scholarly inquiry into international legal cooperation on scientific research, highlighting the need for a more comprehensive analysis. The methodology employed includes comparative and systematic analysis of relevant international legal documents, focusing on how scientific activity is reflected in the statutory frameworks of various UN organizations. The article applies methods of analysis and synthesis, as well as structural, formal-legal, and hermeneutic approaches, utilizing both deduction and induction. The most relevant results indicate that scientific activity is consistently regulated within key treaties, especially in the UNESCO Constitution and IAEA Statute. The article also identifies references to science and scientific activity in the statutes of other organizations, including the World Meteorological Organization, WHO, FAO, and the International Maritime Organization, showing the wide regulatory framework governing scientific research across different sectors.

Keywords: legal regulation, UN specialized agencies, scientific research, international organizations.

Resumen

El objetivo del artículo es explorar cómo se aborda la integración de los aspectos educativos en la regulación jurídica de la investigación científica en los instrumentos constitutivos de los organismos especializados de las Naciones Unidas. Busca mostrar cómo la educación sirve como puente entre los avances científicos y sus aplicaciones prácticas, haciendo que la investigación sea más accesible a la sociedad. El artículo identifica una brecha en la investigación académica sistemática sobre la cooperación jurídica internacional en materia de investigación científica, destacando la necesidad de un análisis más integral. La metodología empleada incluye un análisis comparativo y sistemático de documentos jurídicos internacionales relevantes, centrándose en cómo se refleja la actividad científica en los marcos



estatutarios de varias organizaciones de las Naciones Unidas. El artículo aplica métodos de análisis y síntesis, así como enfoques estructurales, formales-jurídicos y hermenéuticos, utilizando tanto la deducción como la inducción. Los resultados más relevantes indican que la actividad científica está regulada de manera consistente en tratados clave, especialmente en la Constitución de la UNESCO y el Estatuto del OIEA. El artículo también identifica referencias a la ciencia y la actividad científica en los estatutos de otras organizaciones, incluida la Organización Meteorológica Mundial, la OMS, la FAO y la Organización Marítima Internacional, lo que muestra el amplio marco regulatorio que rige la investigación científica en diferentes sectores.

Palabras clave: regulación legal, agencias especializadas de la ONU, investigación científica, organizaciones internacionales.

Introduction

The regulation of scientific research at an international level is crucial for ensuring global cooperation, transparency, and ethical standards. As science increasingly shapes global challenges like climate change, health crises, and technological advancements, robust legal frameworks are essential to managing research practices and fostering equitable access to scientific benefits. However, the legal mechanisms governing scientific activity, particularly within the context of UN specialized agencies, have not been systematically explored, highlighting the need for this study. Moreover, incorporating educational aspects into this regulatory framework is vital. Education helps not only in disseminating scientific knowledge but also in making legal regulations more transparent, fostering a better-informed global public that can actively engage with scientific advancements.

The study aims to examine the legal regulation of scientific research within UN specialized agencies, with a focus on how education enhances the understanding and effectiveness of these regulations. This topic is especially relevant given the increasing need for international legal cooperation on scientific issues.

The article begins by reviewing existing scholarship on the international legal regulation of science, highlighting the absence of systematic inquiry into the topic and underscoring the originality of incorporating education into these discussions. A comparative and systematic analysis of relevant UN documents follows, utilizing various legal methods such as analysis and synthesis to examine how scientific activity is addressed within different agencies. The results illustrate how scientific research is integrated into the statutory frameworks of organizations like UNESCO and the IAEA, while also comparing the regulatory approaches of these bodies. Furthermore, the study explores the educational aspects of these frameworks, stressing their importance in fostering public engagement and understanding. Ultimately, the article concludes that education is crucial for improving the transparency and accessibility of scientific regulations, which in turn ensures their effective implementation.

The article reveals that scientific activity is consistently regulated within the foundational documents of various UN organizations, particularly in UNESCO and IAEA statutes. It also identifies a growing trend of incorporating educational initiatives into these regulatory frameworks. Education not only improves the dissemination of scientific research but also ensures that legal mechanisms are more accessible and understood by the public. This educational integration enhances the impact of international legal frameworks by fostering a globally informed and engaged community, thereby strengthening the practical application of scientific advancements.

This study contributes to the field by bridging the gap between legal regulation and educational dissemination, demonstrating the importance of education in international scientific governance. Its findings underscore the need for further scholarly attention to this interdisciplinary area, which combines international law, scientific research, and education.



Literature Review

Among Ukrainian scholars, the mentioned issues were addressed in the works of Babin (2014; 2023), but comprehensive monographic studies on relevant matters have not yet been conducted. Additionally, references to research were made in the work of the International Maritime Organization (Babin, Chvaliuk, & Plotnikov, 2021a; Babin, Plotnikov, & Prykhodko, 2023), and the Food and Agriculture Organization of the United Nations (Babin, 2019; Babin, Chvaliuk, & Plotnikov, 2021b), as well as other United Nations bodies (Babin, 2014; Babin, 2023), but they were fragmentary in nature.

Special rapporteurs of the UN in the field of cultural rights, A. Xantaki, and on the right to education, F. Shakid, attempted to generalize relevant findings (Babin, & Tytska, 2023; Babin, & Tytska, 2024), concerning the right to science in the international legal dimension. Furthermore, in her own report A/HRC/55/44 to the UN Human Rights Council in 2024 titled "The Right to Participate in Science," Special Rapporteur Professor A. Xantaki (2024) emphasized the importance of an inclusive approach to realizing the right to science. She advocated for the creation of numerous and large-scale mechanisms for scientific and political interaction, as well as the implementation of special measures to remove barriers to exercising this right. Xantaki underscored the urgent need for states, international organizations, and private entities to adhere to a human rights approach in all science-related matters.

Moreover, UN Special Rapporteur A. Xantaki (2024) noted that a broad, inclusive, and decolonized interpretation of the concept of "science" is essential for exercising the right to participate in scientific activities. She emphasized that the involvement of various scientific societies enriches the scientific component of society, ensuring the representation of different stakeholders and the development of comprehensive solutions to current problems. Xantaki recommended that UN bodies "request all United Nations bodies and satellite agencies to review their regulatory frameworks in line with a human rights approach to science and the right to participation in science, including the sharing of the benefits of scientific progress and emerging technology" and to "strengthen, through its monitoring processes, the implementation of the right to participate in science, including through core indicators and guiding questions." She also suggested studying the proposal for the introduction of a new position of Special Rapporteur on the right to science and technology, fully understood as one of the cultural rights.

However, these proposals have not yet been systematically implemented, even at the doctrinal level, and in the report A/HRC/55/44, as the latest key document regarding the international legal dimension of scientific activity, the issue of the statutory acts of specialized UN agencies was not addressed. Similarly, contemporary authors who have investigated scientific activity in international law from a human rights perspective have not addressed this issue. These include articles by Achermann, & Besson (2023), Plozza (2023), Shaver (2010; 2015), and the monograph on the right to science by Ch. Romano & A. Bodgio (2024).

The integration of educational aspects into the regulatory frameworks of scientific research is highlighted in the works of various scholars and reports. For instance, the emphasis on education in promoting understanding and accessibility of scientific research is underscored in the reports by UN Special Rapporteurs. Education is considered essential not only for disseminating knowledge but also for fostering an inclusive approach to science. By educating the public and policymakers about scientific research and its benefits, these frameworks can ensure broader participation and adherence to ethical standards.

Educational initiatives within the legal frameworks of UN specialized agencies can enhance the capacity of researchers and institutions, ensuring that scientific research is conducted responsibly and its findings are effectively utilized. This approach is aligned with the recommendations by A. Xantaki, who advocated for educational measures to remove barriers to the right to participate in science.

Furthermore, the role of education in the right to science is also reflected in the broader discourse on human rights and scientific activity. Authors such as Shaver (2010; 2015) and Romano & Bodgio (2024) have



emphasized the importance of educational programs in ensuring that scientific advancements are accessible and beneficial to all segments of society.

In summary, the literature underscores the need for integrating educational aspects into the legal regulation of scientific research. This integration is crucial for enhancing public understanding, ensuring ethical compliance, and fostering inclusive participation in scientific activities.

Methodology

This study is qualitative, chosen for its focus on interpreting and understanding legal texts within UN specialized agencies' statutory frameworks. A qualitative approach allows in-depth exploration of how scientific research is regulated and how educational aspects are integrated into this regulation. The research employs various qualitative methods, including comparative analysis, systematic analysis, and formal-legal methods, which are suitable for analyzing the complex, text-based nature of international legal documents.

Application of Methods:

Comparative Analysis: This method was used to compare the regulatory approaches to scientific research across the statutory documents of different UN agencies. The study examined how these documents reflect scientific activities and educational initiatives.

Systematic Analysis: This method helped structure the legal documents as components of the international legal system, assessing their coherence and consistency in regulating scientific research.

Analysis and Synthesis: These methods were applied to break down the legal texts into specific regulatory components and then synthesize the information to form a comprehensive understanding of the legal landscape governing scientific research.

Structural Methods: These were applied to analyze how scientific research is organized and presented within the documents, focusing on practical regulatory frameworks.

Formal-Legal and Hermeneutic Methods: These were used to interpret legal texts and assess the likelihood of substituting the category of scientific research with other legal constructs in the statutory documents.

Deductive and Inductive Approaches: These methods helped derive broader conclusions about the nature of legal regulation from specific examples in the documents, ensuring a thorough exploration of legal norms.

Integration of Educational Aspects:

The study incorporated educational analysis by evaluating how UN specialized agencies' documents incorporate educational programs and initiatives aimed at enhancing scientific literacy. The comparative educational framework was used to assess the effectiveness of these educational elements, highlighting their contribution to the legal regulation of scientific research. Systematic educational integration ensured that educational theories were applied to the legal texts, making the study applicable to both legal scholars and educational practitioners.

Document Selection Process:

The primary sources were the authentic statutory documents of UN agencies, available on official websites. Inclusion criteria involved documents that directly referenced scientific research or educational initiatives within their regulatory frameworks. Documents were excluded if they did not address scientific activity or had only tangential references to education. A systematic search was conducted to identify relevant legal



documents, ensuring comprehensive coverage.

Validity and Reliability:

To ensure validity, the study focused on official and authentic documents from trusted sources such as UN websites. The comparative approach across multiple agencies enhanced the reliability of the findings by providing diverse perspectives on scientific regulation. The use of established qualitative methods like hermeneutics and formal-legal analysis further strengthened the credibility of the analysis.

Limitations and How They Were Addressed:

One limitation encountered was the variation in how different UN agencies address scientific research, making comparison difficult. To address this, the study employed a standardized comparative framework to ensure consistency. Another limitation was the lack of comprehensive data on the implementation of educational initiatives. This was mitigated by focusing on the presence of educational references within the statutory documents, allowing for a general analysis even in cases where data was sparse.

Software and Tools:

While the study did not require specialized software for analysis, tools like NVivo or similar qualitative analysis software could be used for coding and organizing themes if necessary. However, in this case, the analysis was performed manually due to the focused nature of the document review and the relatively small number of documents analyzed.

Results and Discussion

Contemporary international law has not yet developed a system of separate universal conventions specifically addressing aspects of scientific research; however, these challenges have found reflection in many fundamental treaties of a universal legal nature. While the UN Charter does not contain specifically formulated mechanisms regarding scientific activity (United Nations, 1945), norms concerning scientific research exist, for example, in the Constitution (Statute) of UNESCO dated November 16, 1945 (United Nations Educational, Scientific and Cultural Organization (UNESCO), 1945).

Among other things, Article 1 of the UNESCO Constitution defines the organization's purpose as "to contribute to peace and security by promoting collaboration among the nations through education, science and culture in order to further universal respect for justice, for the rule of law and for the human rights and fundamental freedoms which are affirmed for the peoples of the world, without distinction of race, sex, language or religion, by the Charter of the United Nations." This article assigns UNESCO to "maintain, increase and diffuse knowledge," among other things, by "encouraging cooperation among the nations in all branches of intellectual activity, including the international exchange of persons active in the fields of education, science and culture and the exchange of publications, objects of artistic and scientific interest and other materials of information."

Interestingly, the authentic text of the UNESCO Constitution contains in Articles 4 and 5 regarding scientific research two terms that complement each other: "the sciences and humanities," which in the single available translation of the Constitution into Ukrainian are translated as "humanitarian sciences" and "sciences," respectively, or are listed jointly as "natural-humanitarian sciences." However, this document does not contain detailed regulations on relations in the field of science or scientific research (Verkhovna Rada of Ukraine, 1945).

It is worth noting that under the auspices of UNESCO operates the International Centre for the Study of the Preservation and Restoration of Cultural Property, whose Statute was first approved on December 5, 1956, and in its current version has the task of "collecting, studying, and disseminating documentation on scientific and technical problems of the preservation and restoration of cultural property"; additionally,



"governmental or private institutions of a scientific or cultural nature" may be included as associated members of the Center (International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM), 1956).

Considerable attention to scientific activity is paid by the Statute of the International Atomic Energy Agency (IAEA) of 1956 with subsequent amendments. According to it, the IAEA is authorized to promote and provide support for scientific research in the field of atomic energy and the development of atomic energy and its practical application for peaceful purposes worldwide, as well as "to perform any operations or provide any services which may be of benefit in scientific research in the field of atomic energy, provide services, materials, equipment, and technical means to meet the needs of scientific research in the field of atomic energy, the development of atomic energy and its practical application for peaceful purposes" (IAEA, 1989).

Moreover, this Statute assigns the IAEA to "foster the exchange of scientific and technical information on peaceful uses of atomic energy" and to "encourage the exchange and training of scientists and experts in the field of peaceful uses of atomic energy." Additionally, among the requirements for IAEA personnel, the Statute includes "such qualified scientific and technical and other personnel as may be required to fulfil the objectives and functions of the Agency" (IAEA, 1989).

It is worth mentioning that to develop the relevant provisions of the IAEA Statute, the Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and Technology was approved in 2017, replacing a similar Agreement from 1987, which was extended for six five-year periods. The Regional Agreement regulates the conduct of the IAEA and states regarding "joint projects for research, development, and training" and "other joint activities in the field of nuclear science and technology."

According to this Regional Agreement, when approving such a joint project, the related "research, development, and training program" is considered, and during the project implementation, "each participating government, subject to compliance with its national laws and regulations," provides necessary scientific and technical resources and personnel for the execution of the joint project and "takes all reasonable and appropriate measures for scientists, engineers, or technical experts," both regarding work at designated own facilities and while working at foreign facilities. Additionally, for each joint project, a Project Committee is established to monitor its implementation, make recommendations to governments and the IAEA regarding the joint project, and review the progress of implementing these recommendations (IAEA, 2017).

It is also worth mentioning Article 2 of the Convention of World Meteorological Organization, according to which the objectives of this institution include facilitating "worldwide cooperation in the establishment of networks of stations for the making of meteorological observations as well as hydrological and other geophysical observations related to meteorology, and to promote the establishment and maintenance of centres charged with the provision of meteorological and related services", as well as promoting "activities in conducting scientific research and training in the field of meteorology and, where necessary, in related fields, and promoting coordination of international aspects of such activities" (World Meteorological Organization, 1947).

Moreover, the preamble of the World Health Organization (WHO) Constitution states that "enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition" and lists among the functions of this organization "to promote and, where necessary, to recommend national and international action with respect to" scientific, technological, social, and economic research pertaining to health, nutrition, and agriculture, as well as "to disseminate scientific knowledge and to encourage the development of teaching and research in the field of health" (World Health Organization, 1946).



In addition, the Food and Agriculture Organization (FAO) of the United Nations Constitution assigns to this institution the function of "promoting and, where appropriate, recommending national and international action with respect to" scientific, technological, social, and economic research related to food, nutrition, and agriculture, as well as "the dissemination of information on nutrition and agricultural science and practice" (Food and Agriculture Organization of the United Nations, 1945).

It is noteworthy that certain statutory documents of specialized agencies of the UN system, which objectively have a broad mandate in organizing scientific research in the respective direction, avoid using the word "science" itself; for example, the International Telecommunication Union Convention uses only the word "research" regarding the relevant activities (International Telecommunication Union (ITU), 1993).

Similarly, the Convention establishing the International Maritime Organization in Article 38 specifies the competence of the organization's Marine Environment Protection Committee to "ensure the provision of scientific, technical, and other practical information on the prevention and control of marine pollution from ships to disseminate to States, particularly developing States, and, where appropriate, to make recommendations and develop guidelines" (WIPO, 1967).

The statutes of other specialized agencies of the UN system also contain separate mentions of scientific issues; for example, the Convention Establishing the World Intellectual Property Organization mentions scientific works, inventions in all fields of human endeavor, and scientific discoveries only in the definition of intellectual property, as well as "all other rights resulting from intellectual activity in the industrial, scientific, literary or artistic fields", but at the same time the corresponding functionality for the organization or for its bodies, this international agreement does not outline (International Maritime Organization, 1948).

In subparagraph "d" of Article 2 of the Constitution of the United Nations Industrial Development Organization (UNIDO) of 1979, it is specified that this UN institution "promote and encourage the development and use of planning techniques, and assist in the formulation of development, scientific and technological programmes and plans for industrialization in the public, co-operative and private sectors"; this Constitution mandates UNIDO to carry out the development, transfer, and adaptation of technology at global, regional, national, and sectoral levels (United Nations Digital Library, 1979).

It is worth noting that under the auspices of UNIDO, the International Centre for Genetic Engineering and Biotechnology (ICGEB) was established in 1983, as reported by the Centre itself in 2024. The Madrid Statute, which came into force in 1994, legalized the Centre as an international organization that integrates its main headquarters with a network of national, sub-regional, and regional branch centers. The tasks before the Center are set out in Article 2 of the Statute: Promote international cooperation in developing and applying peaceful uses of genetic engineering and biotechnology, in particular for developing countries; Assist developing countries in strengthening their scientific and technological capabilities in the field of genetic engineering and biotechnology; Serve as a forum for the exchange of information, experience, and know-how among scientists and technologists of member states.

Act as a focal point of a network of affiliated (national, sub-regional, and regional) research and development centres (United Nations Treaty Collection, 1983).

Among the functions of the Center, Article 3 of the Madrid Statute establishes research and development, including work at experimental facilities, in the field of genetic engineering and biotechnology; training directly at the Center and outside it for scientific and technical personnel; provision, at the request of member states, of advisory services on the development of national technical potential; promotion of "interaction between the scientific and technological communities of the Member States through programmes to enable visits of scientists and technologists to the Centre, and through programmes of associateship and other activities"; convening expert meetings; establishing a network of national and international institutions for joint research programs, etc.

According to Articles 6 and 7 of the Madrid Statute, in appointing their representatives to the Center's Board



of Governors, member states "shall pay due regard to their administrative capability and scientific background", and the Center's Council of Scientific Advisers shall include "ten scientists and technologists in the substantive fields of the Centre". Additionally, "scientist from the host State" is included in the composition of the Council of Scientific Advisers, which includes Italy, India, and South Africa, and at the same time, "due regard shall be paid to the importance of electing the members on a balanced geographical basis" (United Nations Treaty Collection, 1983).

Among other provisions, the Madrid Statute authorizes the Council of Scientific Advisers to develop medium- and long-term perspectives for the programs and plans of the Center, including special and new areas of research, and to submit its recommendations to the Board of Governors; provide assistance to the Center's Director on all major scientific and technical issues, including cooperation with branches.

The Statute specifically states that "the Scientific Advisory Council may establish special groups of scientists from member states of the Center to prepare special scientific reports." It is noteworthy that ensuring the legal status, privileges, and immunities of the Center as an international organization, the Madrid Statute in Article 14 separately regulates aspects of publication and intellectual property rights to the results of its research; among other things, according to this universal agreement, a separate joint policy on intellectual property rights must be approved by the Board of Governors (United Nations Treaty Collection, 1983).

Educational Aspects

The review of the statutory documents of various UN specialized agencies reveals significant emphasis on the integration of education within their mandates, demonstrating that the promotion of scientific research is inherently linked to educational initiatives. This is evident in several ways:

UNESCO's Educational Mandate: Article 1 of the UNESCO Constitution explicitly includes the promotion of education, science, and culture. The organization is tasked with maintaining and increasing knowledge through international cooperation in education and the exchange of scientific and cultural information. This highlights the recognition of education as a critical component in fostering scientific research and global understanding.

IAEA's Training Programs: The IAEA Statute emphasizes the exchange and training of scientists and experts in the peaceful uses of atomic energy. This underscores the importance of educational programs in building scientific capacity and ensuring that advancements in nuclear science are shared and understood globally.

Regional Cooperative Agreements: The IAEA's Regional Cooperative Agreement for Research, Development, and Training includes specific provisions for training programs as part of joint research projects. This reflects the integral role of education in the successful implementation and sustainability of scientific initiatives.

WMO and WHO Educational Initiatives: The World Meteorological Organization and the World Health Organization both highlight the importance of scientific research and training. The WMO promotes activities in conducting scientific research and training in meteorology, while the WHO emphasizes the dissemination of scientific knowledge and the encouragement of research and teaching in health-related fields. These efforts demonstrate the linkage between scientific progress and educational outreach.

FAO's Information Dissemination: The FAO's mandate includes promoting and recommending actions related to scientific research and the dissemination of agricultural science and practice information. This educational aspect is crucial for improving food security and agricultural practices worldwide.

ICGEB's Training and Exchange Programs: The International Centre for Genetic Engineering and



Biotechnology focuses on training scientific and technical personnel and promoting the exchange of information and expertise among member states. This fosters a collaborative educational environment that enhances scientific research and innovation in genetic engineering and biotechnology.

In conclusion, the statutory documents of various UN specialized agencies clearly integrate educational initiatives within their scientific mandates. These educational aspects are essential for building scientific capacity, promoting international cooperation, and ensuring the effective dissemination and application of scientific knowledge. By fostering a strong educational foundation, these agencies contribute to the sustainable development and global advancement of scientific research.

Conclusions

It is worth noting the absence of a developed system of collective agreements regarding scientific research at the universal level. However, despite this, the relevant issue is quite widely reflected in the statutory documents of international organizations within the UN system. Such reflection, among other things, contributed to the conclusion of additional agreements and regulatory acts regarding the development of provisions of statutory documents concerning individual organizations.

Scientific activity is subject to fairly consistent regulation in the Constitution (Statute) of UNESCO of 1945; these provisions were further developed in the work of the International Centre for the Study of the Preservation and Restoration of Cultural Property under the auspices of UNESCO.

Similarly, relevant provisions regarding scientific activity are contained in the Statute of the IAEA of 1956, and the development of relevant provisions was approved in a series of Regional Agreements on cooperation in research, development, and training in areas related to nuclear science and technology. In addition, the provisions of the UNIDO Constitution regarding scientific and technical programs are developed in the Madrid Statute of the International Centre for Genetic Engineering and Biotechnology.

References to science and scientific activity are also found in the Statute of the World Meteorological Organization, the Statute of the World Health Organization, the Constitution of the Food and Agriculture Organization of the UN, the Convention (Statute) of the International Maritime Organization, and so on.

Some statutory documents of specialized agencies within the UN system, which objectively have a broad mandate in the organization of scientific research in the respective direction, avoid using the word "science"; an example of this is the Statute of the International Telecommunication Union. In fact, this is explained by the reluctance to rely on legal constructs for which there are no systems of collective agreements and by replacing the categories of science and scientific activity with more abstract terms such as "research" and "research activities." Thus, there is a situation of substitution in the statutory documents of certain international organizations within the UN system of the category of science and scientific activity with other legal constructs.

Relevant statutory documents of international organizations within the UN system primarily fix the rights of states to scientific activity for peaceful purposes and contain attempts to outline the main algorithms of interstate interaction in the field of science; at the same time, such regulatory models often have a rather abstract character. At the same time, the studied universal international organizations are quite cautious in defining the functionality of their own structural units in the field of organizing scientific research, even when this directly follows from the mandate of the relevant supranational structure.

The evolution of the respective models should be the subject of further scientific research. At the same time, an important goal of further research should be the forms of implementing the standards embodied in the statutory documents in the dimension of bilateral agreements between Ukraine and specialized institutions of the UN system and accordingly reflecting such standards in the development of Ukrainian national legislation.



Such prospects of scientific research acquire special significance considering the limited and wide variability of existing bilateral agreements of Ukraine regarding scientific research and relevant studies and to some extent the obsolescence of the profile national legislation, both in terms of cooperation with international organizations and regarding the supranational dimension of scientific research.

The relevance of further intensification of research in this dimension is also enhanced by the expansion of project activities of specialized institutions of the UN system in Ukraine and the institutional strengthening of the presence of individual profile institutions, such as FAO and IAEA, in Ukraine due to the conditions of massive Russian aggression.

In addition, in modern conditions, opposition to destructive manifestations and provocations of the aggressor state and other countries-violators of international law, which are traced in universal international structures, including abuse of the relevant mechanisms for organizing scientific cooperation, acquires special significance. Therefore, the relevant aspects of improving international statutory documents for effective counteraction to such provocations are of particular importance.

The development of doctrinal reflection of the current state of affairs regarding international standards of scientific activity, moreover, can influence the gradual formation of a scientific basis for the development of universal international contractual documents regarding the regulation of scientific research.

The integration of education within the statutory mandates of various UN specialized agencies demonstrates that the promotion of scientific research is inherently linked to educational initiatives. For example, UNESCO's Constitution explicitly includes the promotion of education, science, and culture. The IAEA emphasizes the exchange and training of scientists and experts in the peaceful uses of atomic energy, while the Regional Cooperative Agreement for Research, Development, and Training includes specific provisions for training programs. Additionally, the World Meteorological Organization and the World Health Organization both highlight the importance of scientific research and training in their mandates, and the FAO promotes the dissemination of agricultural science and practice information. The International Centre for Genetic Engineering and Biotechnology focuses on training scientific and technical personnel and promoting the exchange of information and expertise among member states.

These educational initiatives are essential for building scientific capacity, promoting international cooperation, and ensuring the effective dissemination and application of scientific knowledge. By fostering a strong educational foundation, these agencies contribute to the sustainable development and global advancement of scientific research.

Bibliographic References

- Achermann, K., & Besson, S. (2023). International cooperation under the human right to science: What and whose duties and responsibilities? *Frontiers in Sociology*, 8, 1-17.
- Babin, B., Chvaliuk, A., & Plotnikov, O. (2021a). Attempted Annexation of Crimea and Maritime Environment Legal Protection. *Lex Portus*, 7(1), 31-52.
- Babin, B., Chvaliuk, A., & Plotnikov, O. (2021b). Epidemiologic Activities in the Modern Crimea: Humanitarian Challenges and Possible Solutions. *Medical News*, LXXIV(11), 2940-2945.
- Babin, B., Plotnikov, O., & Prykhodko, A. (2023). Damage to the Maritime Ecosystems from the Destruction of the Kakhovka Dam and International Mechanisms of its Assessment. *Lex Portus*, 9(5), 23-32
- Babin, B. (2019). Health Care for Crimean Residents: Interstate Conflict Challenges and Possible Legal and Organisational Solutions. *Medical News*, LXXIII(12), 2441-2444.
- Babin, B. (2014). Rights and Dignity of Indigenous Peoples of Ukraine in Revolutionary Conditions and Foreign Occupation: Evolution of the Statute of the Indigenous Peoples of Ukraine, as Legal Grounding for Crimea. *Anthropology & Archeology of Eurasia*, 53(3), 81-115.



- Babin, B. (2023). *Water Scarcity in the Crimea and the Ecological Catastrophe in the Black Sea*. Crimea from Regional and International Perspectives, 97-115. Istanbul: SET Foundation Economic Enterprise. <https://setadc.org/wp-content/uploads/2023/05/K93En.pdf>
- Babin, B., & Tytska, Y. (2023). *Russian Aggression in Ukraine and Violation of Rights to Science*. ARC; UN Special Rapporteur in field of cultural rights. <https://acortar.link/9W3xHE>
- Babin, B., & Tytska, Y. (2024). *Russian Aggression in Ukraine and Repressions against Academic Freedoms*. ARC; UN Special Rapporteur on the right to education. <https://acortar.link/KDoZfM>
- Food and Agriculture Organization of the United Nations. (1945). *The Constitution*. Retrieved from <https://www.fao.org/3/x5584e/x5584e0i.htm>
- IAEA. (1989). *The Statute*. Retrieved from <https://www.iaea.org/sites/default/files/statute.pdf>
- IAEA. (2017). *Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and Technology*. Retrieved from <https://acortar.link/KDSxMV>
- International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM). (1956). *The Statutes*. Retrieved from <https://treaties.un.org/doc/Publication/UNTS/Volume%201321/volume-1321-I-22032-English.pdf>
- International Telecommunication Union (ITU). (1993). *The Constitution*. Retrieved from <https://www.itu.int/en/council/Documents/basic-texts/Constitution-E.pdf>
- International Maritime Organization. (1948). *Convention Establishing the World Intellectual Property Organization*. Retrieved from https://www.jus.uio.no/english/services/library/treaties/14/14-01/imo_consolidated.html
- Plozza, M. (2023). *The science lens: the human right to science*. Geneva Science and Diplomacy Anticipator. Retrieved from <https://radar.gesda.global/introduction/2023-highlights-deep-dives/the-science-lens-the-human-right-to-science>
- Romano, C., & Boggio, A. (2024). *The Human Right to Science: History, Development, and Normative Content*. Oxford: Oxford University Press.
- Shaver, L. (2010). The Right to Science and Culture. *Wisconsin Law Review*, 1, 121-84.
- Shaver, L. (2015). The Right to Science: Ensuring that Everyone Benefits from Scientific and Technological Progress. *European Journal of Human Rights*, 4, 411-430.
- United Nations. (1945). *United Nations Charter*. Retrieved from <https://www.un.org/en/about-us/un-charter>
- UNESCO. (1945). *Constitution of the United Nations educational, scientific, and cultural organization*. Retrieved from <https://www.refworld.org/legal/constinstr/unesco/1945/en/41638>
- Verkhovna Rada of Ukraine (1945). *Constitution of UNESCO (Statute of the United Nations Educational, Scientific and Cultural Organization)*. Retrieved from https://zakon.rada.gov.ua/laws/show/995_014#Text
- World Meteorological Organization. (1947). *The Convention*. Retrieved from <https://oag.gov.bt/wp-content/uploads/2011/02/Convention-of-the-World-Meteorological-Organization.pdf>
- World Health Organization. (1946). *The Constitution*. Retrieved from https://treaties.un.org/doc/Treaties/1948/04/19480407%2010-51%20PM/Ch_IX_01p.pdf
- United Nations Digital Library. (1979). *Constitution of the United Nations Industrial Development Organization*. Retrieved from <https://digitallibrary.un.org/record/7695>
- United Nations Treaty Collection (1983). *Statutes of the International Centre for Genetic Engineering and Biotechnology*. Retrieved from https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XIV-7&chapter=14&clang=_en
- WIPO. (1967). *The Convention*. Retrieved from <https://www.wipo.int/treaties/en/convention/>
- Xantaki, A. (2024). *Right to participate in science. Report of the Special Rapporteur in the field of cultural rights A/HRC/55/44*. Human Rights Council 55th session. United Nations. Retrieved from <https://acortar.link/nYQ1tT>




DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.14>

Cómo citar:


Boyko, A., Nahliukov, I., Balukh, M., Zinchenko, H., & Kosteniuk, L. (2024). The impact of educational programmes on building safety culture in modern society. *Revista Eduweb*, 18(3), 178-192. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.14>

The impact of educational programmes on building safety culture in modern society


El impacto de los programas educativos en la creación de una cultura de la seguridad en la sociedad moderna

Angela Boyko <https://orcid.org/0000-0002-6414-2214>
alesamytnyk@gmail.com


Cherkasy State Technological University, Cherkasy, Ukraine.

Ihor Nahliukov <https://orcid.org/0009-0002-7002-9303>
ilonadumanskaa@gmail.com


Cherkasy State Technological University, Cherkasy, Ukraine.

Mykola Balukh <https://orcid.org/0000-0001-9628-3671>
balukh.mykola@gmail.com

Khmelnyskyi Humanitarian-Pedagogical Academy, Khmelnyskyi, Ukraine.

Hanna Zinchenko <https://orcid.org/0000-0002-4730-2933>
annazinpm@gmail.com

Kyiv National Linguistic University, Kyiv, Ukraine.

Liudmyla Kosteniuk <https://orcid.org/0000-0002-1828-7084>
liudmylazhurakhovska@gmail.com

Yuriy Fedkovych Chernivtsi National University, Chernivtsi, Ukraine.

Recibido: 01/08/24

Aceptado: 25/09/24

Abstract

Safety culture is an important element in the development of human thinking before making decisions in emergency situations. The aim of the study is to determine the specifics of the impact of educational programmes on building safety culture in modern society. The authors achieved the aim of the study by employing of the method of analysis, the Likert scale, the impact ratio calculations, the criterion of psychological training, the response coefficient, the J. Phillips' correlation coefficient. The study determined that it is necessary to take into account the development of psychological stability, the impact of possible risks for building a safety culture. It is also necessary to ensure consideration of simulated situations for identifying response mechanisms. The study established that the influence of educational programmes on building safety culture is related to the development of logical thinking. The practical significance of the work consists in determining the mechanisms that have the greatest impact on the possibility of forming a



safety culture in the educational process. The research prospects will be related to the comparison of the effectiveness of the proposed mechanisms during the management of emergency situations in the context of martial law and the influence of adverse weather conditions.

Keywords: Emergency situation, protective function, psychological stability, risk, logical thinking, modelling.

Resumen

La cultura de la seguridad es un elemento importante en el desarrollo del pensamiento humano antes de tomar decisiones en situaciones de emergencia. El objetivo del estudio es determinar las características específicas del impacto de los programas educativos en la creación de una cultura de la seguridad en la sociedad moderna. Los autores alcanzaron el objetivo del estudio empleando el método de análisis, la escala de Likert, los cálculos de la relación de impacto, el criterio de formación psicológica, el coeficiente de respuesta y el coeficiente de correlación de J. Phillips. El estudio determinó que es necesario tener en cuenta el desarrollo de la estabilidad psicológica, el impacto de los posibles riesgos para construir una cultura de la seguridad. También es necesario garantizar la consideración de situaciones simuladas para identificar los mecanismos de respuesta. El estudio determinó que la influencia de los programas educativos en la construcción de la cultura de la seguridad está relacionada con el desarrollo del pensamiento lógico. La importancia práctica del trabajo consiste en determinar los mecanismos que más influyen en la posibilidad de formar una cultura de la seguridad en el proceso educativo. Las perspectivas de la investigación estarán relacionadas con la comparación de la eficacia de los mecanismos propuestos durante la gestión de situaciones de emergencia en el contexto de la ley marcial y la influencia de condiciones meteorológicas adversas.

Palabras clave: Situación de emergencia, función protectora, estabilidad psicológica, riesgo, pensamiento lógico, modelización.

Introduction

Safety culture is an integral part of social development, which is aimed at preserving psychological and physical health. Therefore, the educational process should provide for building a safety culture in modern society, which will enable students to build an understanding of possible unforeseen situations and behaviour during such situations (Hassanpour & Rassafi, 2021; Di & Gong, 2024; Han & Choi, 2024). Martial law in Ukraine requires paying special attention to the development of students' understanding of a safety culture. The relevance of the chosen topic is determined based on the established data.

Safety culture is a set of features that contribute to the regulation of people's behaviour during emergency situations. The educational process contributes to the formation of students' understanding of how to deal with emergency situations (Fabi & Thampi, 2022). In order for students to perceive information, it is necessary to ensure the search for non-standard learning mechanisms, the possibility of applying innovations. Conscious perception of safety culture can be achieved due to the formation of human intelligence, which contributes to the perception of information and its processing. Systematisation of information contributes to activation of thinking for human behaviour during emergency situations. The peculiarities of safety culture can be studied using a separate subject or during the integration of the main criteria into other subjects (Anton et al., 2021; Kovalenko et al., 2023). The training process should include studying not only the peculiarities of an emergency situation, but also the mechanisms for avoiding undesirable consequences, taking into account possible risks. During the educational process, it is necessary to ensure the improvement of students' psychological, intellectual, and ethical readiness for an unforeseen situation (Weinberg & Kimchy Elimellech, 2022).

The educational programmes should be aimed at the development of a new students' worldview, which will contribute to the practical implementation of the protective function. The development of students' awareness has a relationship with the safety culture, which allows solving the tasks regarding safe



behaviour. The development of motivation makes students to be motivated to study safety culture (Timchenko et al., 2022). The level of development of safety culture depends not only on the development of consciousness, but also on one's own experience, which may depend on social, environmental, legal conditions, etc. Safety culture is interconnected with social nature, which involves mutual understanding of people during emergency situations. The educational process should provide approaches to the regulation of student behaviour based on relevant norms and instructions (Aćimović, 2022; Finkeldei et al., 2022). It is also important to develop emotional stability, which will contribute to the quick implementation of an action plan in emergency situations and an adequate assessment of the possible risk occurrence. Psychological stability will allow to obtain better results in the perception of negative impact. The educational process should be provided with correctly developed educational materials that correspond to the current conditions and contribute to the delivery of education in times of emergency (Ren et al., 2023).

The analysis of existing materials on safety culture identified gaps in the information on the development of safety culture under martial law. Current mechanisms of implementing a safety culture in the educational process are superficially described in the works. The aim of the research is to study the impact of educational programmes on building a safety culture in modern society.

The aim involved the fulfilment of the following research objectives:

- Identify the approaches that must be taken into account in the educational process for building a safety culture;
- Determine the level and features of the impact of the educational process on the development of safety culture;
- Measure the level of students' psychological readiness for emergency situations, focusing on the use of the psychological readiness criterion;
- Determine the level of students' response to an emergency situation as a result of the use of modelling techniques.

The study of theoretical information and relevance of the selected topic was implemented in the introduction. A literature review was included in the article to enable a more detailed study of the specifics of the topic and its advantages and possible gaps. The "Methodology" section was aimed at clarifying the main research procedures and methods that contributed to the final results. The research results identified approaches that contribute to forming a safety culture; peculiarities of the influence of educational programs on the development of safety culture principles. Also, during the study, the level of psychological preparation of students for the occurrence of an adverse situation and the level of response of students to the occurrence of an emergency situation using the principles of modelling were determined. In the "Discussion" section, the authors confirmed the novelty of the work based on comparing the obtained results with already published articles. The conclusions reflect the short results of the work that correspond to the research objectives.

Literature Review

One of the priority areas of studying safety culture is radioecology, which can be studied in physics, chemistry, ecology, mathematics, etc. Studying the peculiarities of radio-ecological safety is connected with conducting radio-ecological monitoring of territories, drawing up radiation hygienic passports of the territory. Forecasting the radiation situation and accident prevention mechanisms are also important. The learning process should provide for the formation of human culture and radio-ecological competence. This approach enables adjusting people's actions and ensures organisational safety (Keykhaei et al., 2024). Studying the features of evacuating people during a fire as part of the Life Safety course showed a positive impact on the understanding of the situation by respondents who have training experience. The experience made it possible to assess the risk of fire in a building made of non-combustible materials. The learning process should include features of risk perception, evacuation during a fire, advantages and problems of evacuation, development of various fire development scenarios. The results showed that the conducted



trainings prepared the students for the possibility of emergency situations during a fire (Menzemer et al., 2024). Behaviour in emergency situations depends on the individual choice of a person, peculiarities of thinking, which allows maintaining the correct action plan. Deep learning develops human logic, which minimises the number of errors, and affects the improvement of cognitive and visual intelligence. Thinking may be developed as a result of immersion in a particular situation, which affects the speed and accuracy of response in emergency situations (Bahamid et al., 2024).

The Minecraft application was used in the educational process to study the features of handling and evacuation during a fire. The interactive platform was used for recognition of people's coordinates for conducting virtual experiments. A realistic simulation of the occurrence of a fire was provided on the basis of movement and behaviour pattern of pedestrians, which involves focusing on certain emergency response mechanisms. This contributes to the development of self-organised behaviour and the psychological impact of an emergency on a person (Shi et al., 2024). During the analysis of an emergency situation, it is necessary to take into account the possibility of avoiding panic during an unforeseen threat. During training, it is necessary to provide an explanation of the possibility of negative situations, which helps to coordinate actions and avoid crowd panic. Simulation experiments are important for understanding human behaviour, which contributes to proper response in emergency situations (Pişirir et al., 2024). Human behaviour during an emergency evacuation depends on spatial knowledge. Virtual reality techniques were used in the training process, which allowed to simulate a fire in a shopping centre. The results of the study showed that evacuation using navigation reduced the time to find an exit. This allows for the training of practical skills in handling fire and people's preparedness for emergency situations (Mao et al., 2024).

Behavioural characteristics of people have the greatest influence on the effectiveness of evacuation of people during emergency situations. In the educational process, it is necessary to focus on the psychological component of evacuation and the optimal algorithm of influence on predicting the development of an emergency situation. It was established that understanding the methods of evacuation allows to shorten the path and the correctness of evacuation (Luan et al., 2023). Maintaining an emotional state during emergency situations is one of the necessary elements of training. Stress management strategies can be learnt through experimental training based on standardised examples. Research findings showed that reduced empathy is a useful tool for emotional protection during an emergency situation (Völker & Flohr-Devaud, 2023).

The analysis of academic articles established that the behaviour in emergency situations is primarily related to different types of fire. The training was implemented through the use of virtual models, and the training was developed for specialist students to a greater extent rather than for all students. The established results reflect gaps in research on building security culture during martial law.

Methodology

Research design

The first stage of the research involved determining the educational approaches that contribute to building the students' safety culture. The focus was on the courses Regional Development and Spatial Planning, Ecology, "Life safety" and others, which include the topics related to safety culture. Attention was paid to the study of regional aspects of the population's quality of life. This allowed us to localise the research object and focus on more specific approaches to modelling emergencies and ways to address them. The process allows us to take into account the needs of the population of a particular region, natural factors, etc. The second stage of the research provided for determining the influence of educational programmes on the development of safety culture. The second stage of the study was related to determining the level of psychological readiness achieved by the students to respond to emergency situations. The third stage of the research was related to determining the developed level of students' response to a simulated



emergency situation. The choice of a state of emergency was explained by the negative consequences of the influence of the martial law introduced in Ukraine.

Sampling

The study involved 160 students of:

- The Department of Philosophy and Political Science of Cherkasy State Technological University;
- The Department of Tourism, Theory and Methods of Physical Culture and Valeology of Khmelnytskyi Humanitarian-Pedagogical Academy;
- The Department of Geography of Ukraine of Yuriy Fedkovych Chernivtsi National University.

Restrictions on the students' selection are related to the inclusion of Regional Development and Spatial Planning, Ecology courses in the training programme. This enables only to determine the specifics of the safety culture in more detail, but also to obtain practical results. Before the research, the students were familiarised with the plan for the organisation of the educational process and their participation in each of the research stages.

Methods

The approaches to be followed in the educational process for building a safety culture were determined on the basis of the analysis of the features of the safety culture and its main principles. Emphasis was placed on the possibility of students' practical response to possible emergency situations, the peculiarities of their occurrence, and the creation of possible risks. Attention was also paid to preserving the students' mental health, minimising the impact of stress during a dangerous situation. Simulation of dangerous situations was developed using digital technologies (Autodesk 3ds Max, Google Earth) (Figure 1). The established educational approaches were included in the subjects Regional Development and Spatial Planning, Ecology, which provided for 4 months of training.

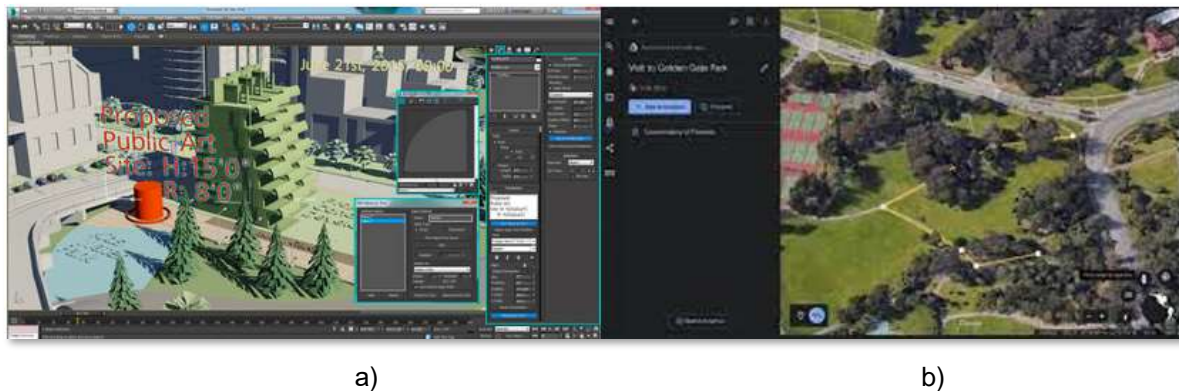


Figure 1. Features of use in the educational process: a) Autodesk 3ds Max; b) Google Earth

The impact of educational programmes on the development of safety culture was determined by involving students. The Likert scale was used to determine the influence of the educational process on the understanding and level of safety culture: positive, neutral, negative. Students should focus on the need for self-study of safety culture. According to the Likert scale, students assigned points from 1 to 3 to the most influential indicator (Lyu et al., 2024). The data were transferred from the students to the authors of the article via e-mail. A specific impact of educational programmes on the development of safety culture was determined using the method of analysis. An analysis of training programmes and specific features of safety culture was carried out in the research. The most influential indicators were determined with the help of calculations of the impact ratio developed by the authors of the article:

$$k_n^i = \frac{f^p + a + g^m}{n}, \quad (1)$$

f^p – the frequency of using a particular principle in the educational process;
 a – the need to apply a separate principle for building a safety culture;
 g^m – the greatest manifestation of a separate principle developed in the learning process among students;
 n – the number of principles that were selected for research.

The level of students' psychological readiness for an emergency situation was determined as a result of observing students' actions while solving situational problems. The students were also required to pass the Spielberger-Hanin test (Balboa et al., 2024), the results of which were used for calculating the psychological readiness. The Spielberger-Hanin test enables determining the predominant anxiety type. These indicators are important for monitoring students during an emergency situation. The test determines the level of anxiety at a certain moment.

$$c^{pt} = m^i + l^s + l^r, \quad (2)$$

m^i – providing students with opportunities to conduct intelligent modelling of emergency situations;
 l^s – the students' stress resistance level during emergency situations;
 l^r – the level of students' readiness for an emergency situation.

Checking the practical level of students' response to emergency situations involved their simulation as a priority. The simulation involved consideration of situations that may arise during martial law. Some examples of simulated situations are presented in Figure 2. The authors indicated possible variants of the tasks that were set before the students. Students had to determine the level of negative impact of the situation, possible consequences, methods of protection, action plan, focusing on regional aspects of the quality of life. The results were determined on the basis of calculations of the response coefficient developed by the authors of the article:

$$k^r = \frac{m^r + m^t + i}{m^n}, \quad (3)$$

m^r – a score for a meaningful response to the emergency situation;
 m^t – a score for maintaining psychological stability techniques;
 i – a score for compliance with emergency response instructions;
 m^n – the maximum possible number of points that could be obtained by students.

Examples of simulated situations:

Task 1. Students need to assess the potential risks and plan for dealing with an air alert while outside. There is no suitable shelter nearby. Students need to assess the location to ensure safety and determine possible risks by analysing the terrain. It is also necessary to justify life-saving approaches (Figure 2).



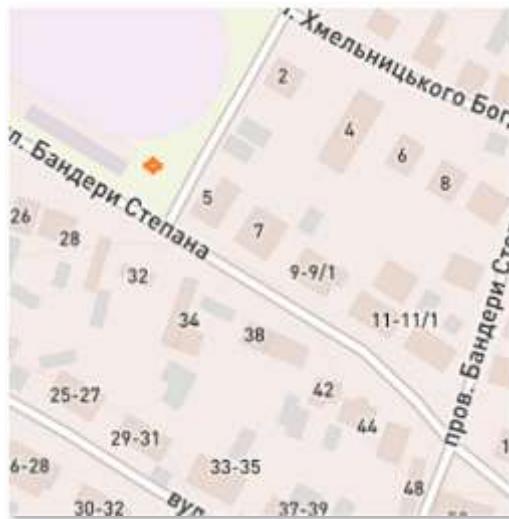


Figure 2. One of the examples of terrain for assessing the occurrence of possible risks.

Task 2. It is necessary to reduce a person's anxiety caused by the explosion he saw. This task involves a situational game with victims and bystanders, which is connected with developing communication skills.

The process consists of asking and answering open questions, which ensures the conditions of treatment of the victim and determines the response mechanisms. The task is aimed at determining the consequences of students' actions and the possibility of managing emotions. Mechanisms for providing pre-medical assistance to the victims were also involved.

Task 3. Determine the level of possible danger during an explosion based on a mass media report on emergency situations. Describe the possibility of self-protection, giving specific examples and the possibility of helping others. Simulate possible risks and elimination mechanisms.

Data analysis

The obtained calculations were confirmed by using the J. Phillips' statistical correlation coefficient. Calculations were presented to confirm the level of students' psychological readiness and the level of students' response in emergency situations. Estimated indicators correlate when the J. Phillips' correlation coefficient approaches 1 (Barabash & Weigang, 2021).

$$p = 1 - \frac{6 \sum d^2}{n^3 - n}, \quad (4)$$

d – the difference of indicators, which reflect the comparison of different values among themselves;
 n – the total number of parameters for statistical calculation;
 $\sum d^2$ – the sum of the obtained difference of indicators.

Results

When building students' safety culture during martial law, the authors of the article developed approaches that must be taken into account in the educational process (Figure 3).

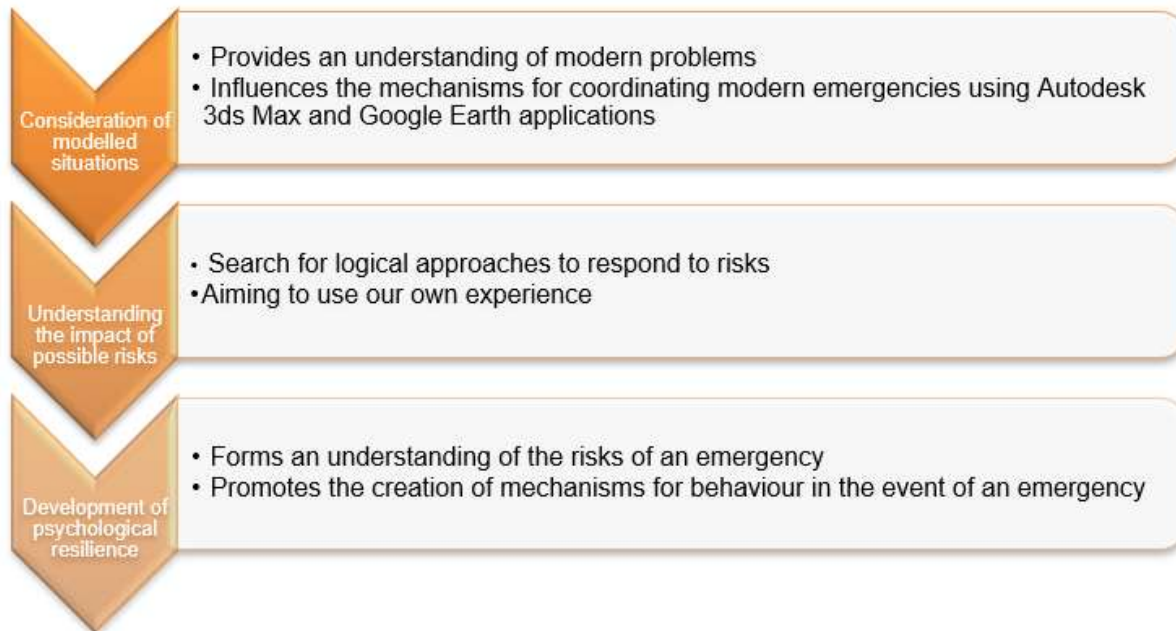


Figure 3. Approaches that contribute to building of a safety culture

The development of psychological stability is an important criterion for the perception of safety culture, as it forms an idea of the risks of a possible emergency situation and the handling mechanisms. Psychological stability ensures an up-to-date perception of an emergency situation. It should also be aimed at developing communication skills, which will contribute to active interaction with other students. Psychological stability should be aimed at avoiding panic and more conscious actions in accordance with certain conditions. Psychological stability is associated with adherence to certain values in emotional and cognitive behaviour. It should be associated with balance, which will enable resisting external influences and acting in accordance with instructions. Psychological stability helps to maintain a balanced state in extreme situations, avoiding rash actions. Self-control of behaviour helps to make a clear plan of behaviour in emergency situations.

Consideration of simulated situations develops skills of practical preparedness for an emergency situation. Simulation of emergency situations in the educational process may involve digital technologies. The Autodesk 3ds Max application facilitates the creation of two-dimensional charts. Google Earth is used to display the real situation. The process is aimed at following the instructions, which reflect a certain procedure for actions during an air alert, radiation safety, etc. This element is aimed at determining possible options for the development of an emergency situation and approaches to its resolution. The implementation of a well-thought-out plan involves determining the resources that must be attracted. Simulation promotes teamwork, which provides practical knowledge for dealing with and solving individual situations. Simulation provides development of analytical, research, communication and professional skills. Simulation stages identify the features of dangerous situations, determine possible obstacles, and orientation in the choice of possible actions. The simulation process is aimed at understanding modern problems and choosing the most effective ways to solve them.

Understanding the impact of possible risks is related to the development of safety culture features for the formation of students' safe behaviour. Understanding the occurrence of possible risks involves the analysis of various information about exposure to develop measures for their prevention and management. This approach will ensure the selection of the most logical approaches for responding to certain events. Knowledge of the impact of possible risks contributes to the selection of mechanisms for reducing the negative impact. The educational process should also provide for determining the causes of possible risks, using the possibilities of professional activity. Studying the impact of possible risks may be related to

holding conferences, business debates. This learning criterion should be oriented towards life and professional experience, which will contribute to the implementation of new ideas, focusing on the formation of certain values, understanding of one's own benefit. The exchange of skills contributes to a deeper understanding of the safety culture by students and the possibility of finding non-standard solutions for dealing with non-standard situations.

The research determined how educational programmes contribute to the formation of the safety culture principles. Their role was determined in general, without focusing on a specialised academic subject only (Table 1, Figure 4).

Table 1.

The influence of educational programmes on building safety culture principles

Development features	k_n^i	J. Phillips correlation coefficient (p)		
		$\sum d^2$	n	p
Psychological development	2,71	25,7	4	1,57
Communication skills	2,87	27,4	4	1,74
Logical thinking	2,93	29,5	4	1,95
Digital competence	2,64	24,1	4	1,41

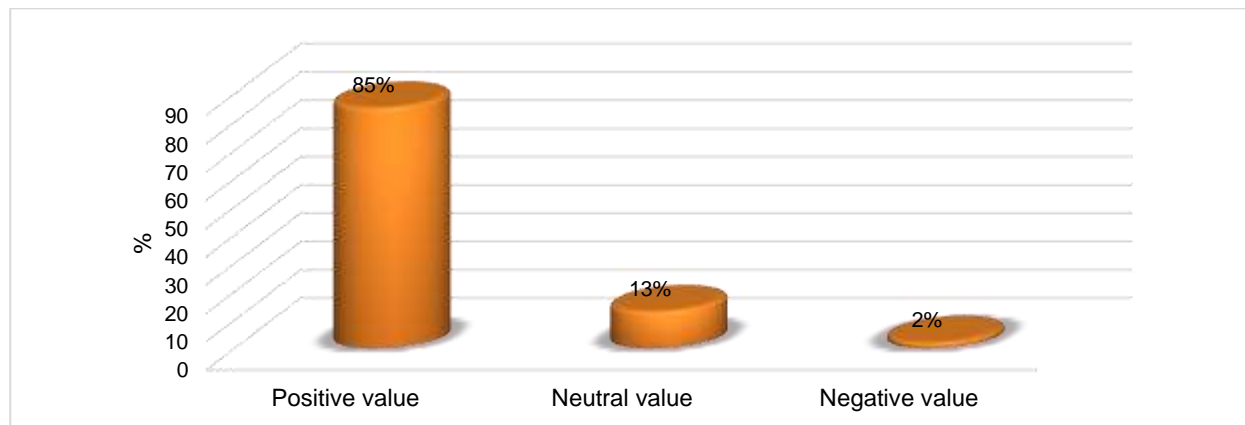


Figure 4. The general importance of the educational process for building safety culture

Educational programmes have a positive impact on building a safety culture, which is associated with psychological development, communication skills, logical thinking, and the development of digital literacy. Logical thinking skills are developed during the study of various both professional and general academic subjects. Logical thinking enables reacting correctly during the period of adverse situations, to develop a particular plan. In addition, logical thinking allows taking into account possible risks, which contributes to a better understanding of the safety culture under the influence of emergency situations.

The development of communication skills is also an integral part of the educational process, which is related to the discussion of information, work in groups, etc. Communication skills make it possible to ensure social cohesion and avoid contradictions. This approach during the discussion determines the most favourable option for actions. Psychological development can also occur during training, which allows you to respond correctly to the occurrence of emergency situations. This helps to eliminate stress and promotes conscious perception of the right decisions. Psychological development contributes to the individual preparedness of a person, focusing on the specifics of the safety culture. The use of innovative approaches in the educational process enables expanding the mechanisms of in-depth study of specific information. The use of modern technologies contributes to the detailed study of methods of action during emergency situations

using simulation techniques. The research established a general positive influence of the educational process on building safety culture. This is due to the possibility of developing various skills in the course of professional activity.

The study involved determining the level of students psychological readiness for emergency situations (Table 2).

Table 2.

The level of students' psychological readiness for an emergency situation

Psychological readiness level	% of respondents	Psychological readiness	J. Phillips' correlation coefficient
High	74%	14.3	High level – medium level: 1.373
Medium	23%	11.2	High level – low level: 1.806
Low	3%	7.6	Medium level – low level: 1.005

The focus on the students' psychological training showed its high level. Such data are related to the identification of possible risks and mechanisms of the development of emergency situations, the understanding of which was formed during the simulation of various situations. The learning process is aimed at reducing the level of danger, which reflects the students' psychological readiness. Increasing the level of psychological training is connected with an active state of war, which requires correct mechanisms for its implementation. This was reflected in the possibility of perceiving a negative factor and understanding the necessary measures to save one's life. The accumulated professional experience enabled students to implement the skills of behaviour in emergency situations. Positive psychological training was delivered under the influence of constant diagnostics of students' condition and adjustment of their activities in compliance with safety culture. Students obtained psychological training on the basis of developed experiments with the help of simulated situations. Achieving psychological preparation is associated with the perception of emergency situations as a result of observing the possible consequences of development. Among students who received a medium level, the results were associated with a realistic perception of events and an understanding of the mechanisms for solving adverse effects. Psychological readiness allows for successful regulation of security measures.

The level of students' response to the correct sequence of actions during emergency situations was determined. The results were obtained based on emergency simulations (Table 3).

Table 3.

The level of students' response to an emergency situation during simulations

Psychological readiness level	% of respondents	Students' response	J. Phillips correlation coefficient		
			$\sum d^2$	n	p
High level	82%	4.5	9,003	3	1,250
Medium level	18%	3.1	8,410	3	1,103
Low level	-	-	-	-	-

It was established that a low level of response was not recorded among students, as the training provided for the development of psychological stability techniques, identification of possible risks. A high level was mainly achieved, which is associated with the simulation of narrowly focused situations, such as martial law. High results were obtained because the students could understand the principles of spreading emergency situations and assess possible risks. Calculating the occurrence of possible risks contributed to a better understanding of the safety culture and the search for mechanisms aimed at developing an action plan to eliminate the negative impact. A high level was also achieved as a result of the students' compliance with the established instructions. According to the instructions, the students could clearly follow them to implement actions during emergency situations.



Additionally, based on the correlation analysis by J. Phillips, the relationship between the level of psychological training of students and the level of their response to an emergency in the course of simulation was determined. The results are presented in Table 4.

Table 4.

Comparison of the correlation analysis of students' psychological training and the level of developed skills to respond to an emergency

Formed level	Psychological preparation	Level of response	Correlation analysis
High level	1,373	1,250	1,312
Medium level	1,806	1,103	1,405
Low level	1,005	-	-

The obtained results reflect the relationship between the formed level of psychological training and the level of students' response to the possibility of an emergency. The results showed that obtaining high results in the studied indicators has a greater level of influence, which is manifested in a more accurate performance of the tasks, focusing on the experience gained. The achievement of an intermediate level of knowledge by students is reflected in the presence of greater differences in the mechanisms of response to the occurrence of a relevant emergency and the level of psychological training, as it requires additional independent training to achieve higher results. Also, students need to focus on studying regional peculiarities for a qualitative response to an emergency.

Discussion

Emergency rescue training is an important element of the training process, which contributes to the improvement of rescue capabilities. However, the training should be related to the assessment of the possible impact of emergency situations and building of an appropriate model. The use of analytical methods allows for a comprehensive construction of the response assessment in an emergency situation (Ruan et al., 2022). Simulation of behaviour in the educational process makes it possible to identify different scenarios of student behaviour during emergency situations. It can be emergency evacuation, intelligent control. The research results showed that individual and group behaviour is given a lot of attention, but interaction between peers during an emergency situation is not common. The learning process involves taking into account cognitive behaviour, the interconnection of social relations. Modelling student behaviour allows for consistency of action during emergency situations (Fan et al., 2020). Providing effective fire evacuation management strategies to improve pedestrian safety in the training process should be based on understanding the specifics of fire evacuation. The behaviour options were modelled using the Minecraft programme, which involved the inclusion of obstacles on the main path, internal obstacles, etc. In terms of training, this approach made it possible to identify risky behaviour, route formation possibilities, etc. (Zhang et al., 2023). The published articles focused on the development of emergency management strategies based on regulatory mechanisms. In our work, attention was paid not only to modelling mechanisms, but also to the development of psychological stability, understanding the impact of possible risks.

It is important to consider crowding when creating an emergency plan. The educational process should include understanding the methods of forecasting emergency situations, studying their features. It is also necessary to understand the principles of evacuating people, certain routes, the occurrence of additional disasters because of the crowding of people. Prediction of anomalies will contribute to the safety of people (Bahamid & Mohd Ibrahim, 2022). Building a fire safety culture in the educational process can be related to the analysis of systematic reviews and fire reports. Increased immersion in the problems of fire causes higher learning outcomes. The learning process should take into account interdisciplinary approaches that aim to achieve high goals (Menzemer et al., 2023).



The rules of behaviour during natural hazards (earthquakes) should be considered in the educational process, which allows to avoid unpredictable negative consequences. It is necessary to take into account the development of unforeseen situations (changes in the behaviour of the population, increased crowding, changes in transportation, etc.). Taking specific situations into account allows minimising risks. Understanding the possibilities of using innovative ideas helps to find the shortest routes and reduce evacuation time. Spatial knowledge has been found to be the most effective predictor of evacuation (Keykhaei et al., 2023). In the presented works, possible students' behaviour in emergency situations are determined as a result of studying various options for evacuation, which helps to find the most effective mechanisms. Our study established that the effectiveness of safety culture also depends on other factors that were formed during training (psychological development, communication skills, logical thinking, development of digital competence).

Emergency response mechanisms are associated with a high level of uncertainty and complexity. In the educational process, it is necessary to ensure the peculiarities of the exchange of text information during an emergency situation, which ensures a team response and the achievement of higher results (Diachenko et al., 2022; Weger et al., 2022).

The analysis of studies determined that the safety culture in the educational process can be built as a result of studying different evacuation plans. It is also important to understand the features of the territory for the possibility of effective evacuation during an emergency situation. In our work, the emphasis was mostly on students, which involved taking into account the psychological component in the educational process, modelling various situations and determining the impact of possible risks. The work also determined the general impact of the educational process on the development of safety culture. On the basis of simulated situations, the level of psychological readiness for emergency situations and the level of response to them was determined among students.

Limitations

The conducted research was aimed at the formation of a safety culture as a result of the impact of emergency situations, which are connected with the state of war. Other directions of emergency situations (natural, man-made, etc.) were not considered in the work. The presented limitation does not have a significant impact on the obtained results, as the impact of emergency situations during martial law is interconnected with different directions of emergency situations. The work analysed the impact of the educational process on building a safety culture based on the example of the selected student group.

Recommendations

The concept of "security culture" is an integral element of the development of modern society under martial law. Building a safety culture in educational institutions makes it possible to understand the consequences of emergency situations and minimise the negative impact. Understanding the importance of the educational process in building a safety culture contributes to the search for new mechanisms for its development.

Conclusions

The authors achieved the research goal primarily due to the identification of approaches that can contribute to ensuring the educational process. One of the approaches is the development of psychological stability, which is aimed at actual perception of an unfavourable situation. Psychological stability is associated with the need to train conscious actions. Focusing on simulated situations will ensure the development of practical skills and the ability to follow instructions during emergency situations. Understanding the impact of possible risks is related to the understanding of the features of adverse situations and methods of its distribution.



It was established that the educational process is positive for building a safety culture, as it contributes to the development of logical thinking (2.93), communication skills (2.87), psychological development (2.71), and the development of digital competence (2.64). The positive impact of the educational process is associated with the formation of an understanding of the peculiarities of adverse situations and mechanisms for minimising the negative consequences for health. Among the respondents, it was established that building a safety culture in the educational process had a positive effect on their achievement of a high level of psychological readiness (14.3 among 74% of students). First of all, the process is related to accepting an emergency situation and keeping calm during its occurrence. It was determined through emergency simulation that the majority of students (82%) achieved a high level of response.

The practical significance of the work is the possibility of building a safety culture, focusing on effective indicators of influence in the educational process. Research prospects may be related to the comparison of mechanisms of building safety culture in different countries.

Bibliographic References

- Ácimović, L. (2022). Disaster scenarios in Kathrin Röggla's "Die alarmbereiten". *Folia Linguistica et Litteraria*, 13(39), 105-124. Retrieved from <https://folia.ucg.ac.me/image/39/fofia-39.pdf>
- Anton, N. E., Huffman, E. M., Ahmed, R. A., Cooper, D. D., Athanasiadis, D. I., Cha, J. ... Lee, N. K. (2021). Stress and resident interdisciplinary team performance: Results of a pilot trauma simulation program. *Surgery (United States)*, 170(4), 1074-1079. <https://doi.org/10.1016/j.surg.2021.03.010>
- Bahamid, A., & Mohd Ibrahim, A. (2022). A review on crowd analysis of evacuation and abnormality detection based on machine learning systems. *Neural Computing and Applications*, 34, 21641-21655. <https://doi.org/10.1007/s00521-022-07758-5>
- Bahamid, A., Mohd Ibrahim, A., & Shafie, A. A. (2024). Crowd evacuation with human-level intelligence via neuro-symbolic approach. *Advanced Engineering Informatics*, 60, 102356. <http://dx.doi.org/10.1016/j.aei.2024.102356>
- Balboa, A., Cuesta, A., González-Villa, J., Ortiz, G., & Alvear, D. (2024). Uncovering non-emergency-related factors in threat responses: Logistic regression analysis of online experimental data for behaviour patterns. *International Journal of Disaster Risk Reduction*, 104, 104349. <https://doi.org/10.1016/j.ijdrr.2024.104349>
- Barabash, O., & Weigang, G. (2021). Mathematical modeling of the summarising index for the biosystems status as a tool to control the functioning of the environmental management system at business entities. *Mathematical Modeling and Simulation of Systems (MODS'2020)*, vol. 1265, 56-66. https://doi.org/10.1007/978-3-030-58124-4_6
- Di, C., & Gong, J. (2024). An AI-based approach to create spatial inventory of safety-related architectural features for school buildings. *Developments in the Built Environment*, 17, 100376. <https://doi.org/10.1016/j.dibe.2024.100376>
- Diachenko, I., Kalishchuk, S., Zhylin, M., Kyyko, A., & Volkova, Y. (2022). Color education: A study on methods of influence on memory. *Heliyon*, 8(11), e11607. <https://doi.org/10.1016/j.heliyon.2022.e11607>
- Fabi, A. K., & Thampi, S. M. (2022). A psychology-inspired trust model for emergency message transmission on the Internet of Vehicles (IoV). *International Journal of Computers and Applications*, 44(5), 480-490. <https://doi.org/10.1080/1206212X.2020.1814557>
- Fan, Z., He, W., & Mao, Y. (2020). Asymmetric-intimacy-based peer behavior simulation method. *Jisuanji Fuzhu Sheji Yu Tuxingxue Xuebao/Journal of Computer-Aided Design and Computer Graphics*, 32(2), 334-342. <https://www.jcad.cn/en/article/doi/10.3724/SP.J.1089.2020.17922>
- Finkeldei, S., Kern, T., & Rinne-Wolf, S. (2022). Psychosocial emergency care for children after highly stressful life experiences. *Federal Health Gazette – Health Research – Health Protection*, 65, 1023-1030. <https://dx.doi.org/10.1007/s00103-022-03586-z>



- Han, T., & Choi, G. (2024). Designing interactive web-GIS dashboards for data-driven emergency management in smart cities. *Journal of Logistics, Informatics and Service Science*, 11(2), 357-373. <https://doi.org/10.33168/JLISS.2024.0222>
- Hassanpour, S., & Rassafi, A. A. (2021). Agent-based simulation for pedestrian evacuation behaviour using the affordance concept. *KSCE Journal of Civil Engineering*, 25, 1433-1445. <https://doi.org/10.1007/s12205-021-0206-7>
- Keykhaei, M., Samany, N. N., Jelokhani-Niaraki, M., & Zlatanova, S. (2023). A situation-aware emergency evacuation (SAEE) model using multi-agent-based simulation for crisis management after earthquake warning. *Geo-Spatial Information Science*. <https://doi.org/10.1080/10095020.2023.2270017>
- Keykhaei, M., Samany, N. N., Jelokhani-Niaraki, M., & Zlatanova, S. (2024). Multi-agent-based human cognition simulation of Situation-aware earthquake emergency evacuation. *International Journal of Disaster Risk Reduction*, 100, 104183. <https://doi.org/10.1016/j.ijdr.2023.104183>
- Kovalenko, D., Shevchenko, A., Koeberlein-Kerler, J., Shtefan, L., & Kovalska, V. (2023). Didactic adaptation of medical information for the formation of valeological competence in engineering and pedagogical training. *Lecture Notes in Networks and Systems*. 634 LNNS, 310-318. https://dx.doi.org/10.1007/978-3-031-26190-9_32
- Luan, F., Chen, C., Ruan, F., Cheng, Y., Zhu, J., & Wang, J. (2023). Influence of human factors on emergency evacuation efficiency of nuclear power plant accident. *Fushe Yanjiu yu Fushe Gongyi Xuebao/Journal of Radiation Research and Radiation Processing*, 41(4), 040602.
- Lyu, H.-F., Wang, C.-P., Deng, J., Xiao, Y., & Wang, W.-F. (2024). Human behaviour and evacuation time for large underground comprehensive buildings during fire risk process. *Journal of Loss Prevention in the Process Industries*, 84, 105134. <https://doi.org/10.1016/j.jlp.2023.105134>
- Mao, Y., Wang, X., Bai, Q., He, W., & Pan, G. (2024). Simulated interventions based on virtual reality to improve emergency evacuation under different spatial perception models. *International Journal of Industrial Ergonomics*, 99, 103545. <https://doi.org/10.1016/j.ergon.2024.103545>
- Menzemer, L. W., Karsten, M. M. V., Gwynne, S., Frederiksen, J., & Ronchi, E. (2024). Fire evacuation training: Perceptions and attitudes of the general public. *Safety Science*, 174, 106471. <https://dx.doi.org/10.1016/j.ssci.2024.106471>
- Menzemer, L. W., Ronchi, E., Karsten, M. M. V., Gwynne, S., & Frederiksen, J. (2023). A scoping review and bibliometric analysis of methods for fire evacuation training in buildings. *Fire Safety Journal*, 136, 103742. <https://dx.doi.org/10.1016/j.firesaf.2023.103742>
- Piřirir, O. M., Bingöl, O., & Erkan, İ. (2024). Analysis of “faster is slower” effect on panic evacuation with anthropometric measurements. *Applications of Modelling and Simulation*, 8, 48-56.
- Ren, J., Mao, Z., Gong, M., & Zuo, S. (2023). Modified social force model considering emotional contagion for crowd evacuation simulation. *International Journal of Disaster Risk Reduction*, 96, 103902. <https://doi.org/10.1016/j.ijdr.2023.103902>
- Ruan, F., Shen, C., Cheng, Y., Zhu, J., Luan, F., & Wang, J. (2022). Evaluation model of nuclear emergency rescue drill based on AHP weight analysis. *He Jishu/Nuclear Techniques*, 45(1), 010604
- Shi, M., Zhang, Z., Zhang, W., Ma, Y., Li, H., & Lee, E. W. M. (2024). The study of self-organised behaviours and movement pattern of pedestrians during fire evacuations: Virtual experiments and survey. *Safety Science*, 170, 106373. <https://doi.org/10.1016/j.ssci.2023.106373>
- Timchenko, O., Onishchenko, N., Perelygina, L., Prykhodko, I., Lefterov, V., & Ivanchenko, A. (2022). Ukrainian rescuers in local armed conflict conditions: How does it affect the psyche? *Minerva Psychiatry*, 63(2), 159-170. <https://doi.org/10.23736/S2724-6612.21.02242-9>
- Völker, J., & Flohr-Devaud, M. E. F. (2023). Emotions in emergency medical services personnel: Emotional reactivity, empathy, and strategies compared to students. *Emergency and Rescue Medicine*, 26, 101-107. <https://doi.org/10.1007/s10049-021-00930-9>
- Weger, K., Menon, V., Hollingsworth, A., & Schaub, H. (2022). Information sharing behaviors in text-based communication during emergency response. *Journal of Emergency Management*, 20(6), 499-516. <https://doi.org/10.5055/jem.0731>
- Weinberg, M., & Kimchy Elimellech, A. (2022). Civilian military security coordinators coping with frequent traumatic events: Spirituality, community resilience, and emotional distress. *International Journal*



of Environmental Research and Public Health, 19(14), 8826.
<https://doi.org/10.3390/ijerph19148826>
Zhang, Z., Zhang, W., Ma, Y., Lee, E. W. M., & Shi, M. (2023). Experimental study on pedestrian behaviors during fire emergency conditions with Minecraft: Case studies in a classroom. *Fire*, 6(11), 422.
<https://doi.org/10.3390/fire6110422>



DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.15>


Cómo citar:

Zhylin, M., Mendelo, V., Hrytsuk, O., Kononenko, T., & Shamalo, S. (2024). Correlation between students' emotional intelligence and emotional dependency. *Revista Eduweb*, 18(3), 193-203. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.15>

Correlation between students' emotional intelligence and emotional dependency

Correlación entre la inteligencia emocional de los alumnos y la dependencia emocional

Mykhailo Zhylin

 <https://orcid.org/0000-0003-2898-4403>
zhylinmyhailo@gmail.com


Odesa National Maritime University, Odesa, Ukraine.

Viktoriia Mendelo

 <https://orcid.org/0000-0001-7873-8791>
MendeloViki1@gmail.com


South Ukrainian National Pedagogical University named after K. D. Ushynskyi, Odesa, Ukraine.

Oksana Hrytsuk

 <https://orcid.org/0000-0002-6672-4701>
Oxana.gri20@gmail.com


State Higher Education Institution "Donbas State Pedagogical University", Dnipro, Ukraine.

Tetiana Kononenko

 <https://orcid.org/0000-0001-7821-5640>
Tatiankononenko26@gmail.com

Donetsk State University of Internal Affairs, Kropyvnytskyi, Ukraine.

Svitlana Shamalo

 <https://orcid.org/0000-0003-1809-1476>
Sv.Shamalo15@gmail.com

Bogomolets National Medical University, Kyiv, Ukraine.

Recibido: 03/08/24

Aceptado: 29/09/24

Abstract

The aim of the article is to determine the specifics of the relationship between the components of emotional intelligence (EI) and the emotional dependency (ED) reactions in student age. The MSCEIT (The Mayer–Salovey–Caruzo Emotional Intelligence Test) and R. Hirshfield's Interpersonal Dependence Test were used to achieve the aim and objectives of the study. The article analyses the dynamics and correlation of indicators for educational courses at the bachelor's level of higher education institutions (HEIs). The prevalence of the medium indicators of the levels of EI and manifestations of ED was found during the studied period. A significant increase in EI indicators was determined between the second and third years of study. A gradual decrease in the ED reaction before the completion of studies in HEIs was recorded. Significant correlations of the ED parameters with the conscious management of emotions, the ability to understand and identify experiences were calculated. Most often, the connections between the EI components were established to manifested with the level of self-confidence. It can be stated that high EI indicators determine a decrease in EI. The research prospects may be the development and verification of



the effectiveness of programmes for EI development at student age.

Keywords: Emotional dependency, emotional intelligence, students, emotion management, emotional sphere, self-confidence.

Resumen

El objetivo del artículo es determinar las especificidades de la relación entre los componentes de la inteligencia emocional (IE) y las reacciones de dependencia emocional (DE) en la edad estudiantil. Para alcanzar la finalidad y los objetivos del estudio se utilizaron el MSCEIT (Test de Inteligencia Emocional Mayer-Salovey-Caruzo) y el Test de Dependencia Interpersonal de R. Hirshfield. El artículo analiza la dinámica y la correlación de los indicadores de los cursos educativos de nivel licenciatura de las instituciones de enseñanza superior (IES). Se encontró la prevalencia de los indicadores medios de los niveles de IE y manifestaciones de DE durante el periodo estudiado. Se determinó un aumento significativo de los indicadores de IE entre el segundo y el tercer año de estudio. Se registró una disminución gradual de la reacción de DE antes de la finalización de los estudios en IES. Se calcularon correlaciones significativas de los parámetros de la DE con la gestión consciente de las emociones, la capacidad de comprender e identificar experiencias. En la mayoría de los casos, se estableció que las conexiones entre los componentes de la IE se manifestaban con el nivel de autoconfianza. Se puede afirmar que los indicadores de IE elevados determinan una disminución de la IE. Las perspectivas de investigación pueden ser el desarrollo y la verificación de la eficacia de los programas de desarrollo de la IE en la edad estudiantil.

Palabras clave: Autoconfianza, dependencia emocional, esfera emocional, estudiantes, inteligencia emocional, gestión de las emociones.

Introduction

The modern educational system must adapt to current social realities and be based on sound pedagogical methods and focused on mental development (Diachenko et al., 2022). EI is an important element of effective education that has a positive effect on academic success and the general development of students (Quílez-Robres et al., 2023). In particular, this is determined by the growing role of emotions in the regulation of the psyche in adolescence and young adulthood (Camacho-Morles et al., 2021). EI enables regulating experiences and cope with emotional stress in various social and professional spheres (Bru-Luna et al., 2021). The positive influence of the studied phenomenon on the individual's psychological health was proved (Kotsou et al., 2019). EI was established to be significantly related to learning outcomes, educational orientation, and trust in the teacher among students of higher education institutions (HEIs) (Shafait et al., 2021). There are also academic data confirming the positive impact of EI on the system of interpersonal relationships in student age (Caleon et al., 2019).

The latest results are directly related to the study of ED, which significantly limits the freedom and individuality of a person, blocking the opportunities for self-development (Dias Alves et al., 2023). ED creates a situation where an individual neglects his/her own needs and focuses on meeting other people's needs, which causes negative but necessary experiences (Moyeda et al., 2020). The researchers are trying to determine ED in student age. In particular, the relationship of ED with violence and jealousy in youth was studied (Arbinaga et al., 2021). The studies aimed at determining ED indicators of higher school students during the social isolation of quarantine restrictions are also worth noting (Gonzales-Castro et al., 2022). At the same time, the lack of studies that would reveal the connection between EI and ED in the student period can be stated. The study of this issue will allow to more effectively solve practical issues of higher education related, in particular, to the psychological support of the subjects of the educational process.



The aim of the article is to determine the specifics of the relationship between the EI components and the ED reactions in student age.

Research objectives:

- 1) Identify the key characteristics of management and understanding of emotions in higher school students;
- 2) Establish the dynamics of EI and ED indicators during studies in HEIs;
- 3) Analyse the correlation indicators of EI and ED in the student period;
- 4) Establish the dynamics of EI and ED indicators during studies in HEIs.

Literature Review

The problem of EI in psychological science is interpreted in the context of three main positions: as an ability; as a personality trait; combined approach (Bru-Luna et al., 2021). It is appropriate to mention each of these approaches. Mayer et al., (2004) explain EI as a complex of abilities consisting of the following components: perception and reflection of emotions, emotional activation of thinking, understanding of experiences (own and other peoples'), emotional regulation. Another approach defines EI as a stable behavioural model (trait) that, compared to abilities, does not undergo changes over a long period of time. According to Petrides et al., (2016), the main EI components as traits are psychological well-being, self-control, emotionality, and sociability. The latter approach combines features of the previous two theoretical positions. An example of such an interpretation is the Goleman's model (2009), according to which EI includes the ability to recognize and control emotions, self-motivate, and manage interpersonal interactions. These competencies are related to the disposition to leadership and effective management as a personal trait. One of the main functions of EI is the formation of resilience and effective coping with distress (Bunce et al., 2019). Such terminological pluralism determines a large number of instruments for measuring the studied mental phenomenon, which are conditioned by different theoretical concepts (O'Connor et al., 2019). The relevant aspect of the study of EI is the analysis of its manifestations in different social categories.

EI has sufficiently high levels in student age, however, these indicators may differ depending on gender and field of study (Kant, 2019). In general, the research results on EI in higher school students are quite contradictory. There are studies that confirm the relationship between students' academic performance and EI (Altwijri et al., 2021). These characteristics interact through the level of cognitive engagement in the higher education process (Iqbal et al., 2022). At the same time, other studies deny such a relationship, but confirm the correlation between EI indicators and the well-being of students with gender differences (Toscano-Hermoso et al., 2020). The influence of EI on the formation of learning habits of higher school students was proved (Bhat & Khandai, 2016). In the educational process, higher school students tend to focus more on negative emotional states that arise during the performance of academic tasks in the study of the humanities (O'Toole, & O'Flaherty, 2022). Experiencing positive emotions by higher school students is based on awareness and understanding of the educational process, which increases confidence in interpersonal relationships (Kerins et al., 2020). The practical importance of special pedagogical influence focused on the development of students' EI is undoubted (Gonzales, 2022). Such influence should focus on the development of empathy, emotional awareness, social openness, and tolerance (Care et al., 2018). An important direction of pedagogical work in this context should be the formation of moral values as the realization of one of the main goals of education (Tretiak et al., 2021). In this context, the use of modern gadgets and video games to improve the EI structures of youth is worth noting (Cejudo et al., 2019).

Emotional dependency is a mental phenomenon that involves the following components: cognitive (perception of one's own weakness); affective (fear of loneliness and negative attitude of the social environment); motivational (steady desire for external approval of one's own actions); behavioural (conformism of social interaction) (Bornstein, 2011). Zárate-Depraect et al. (2022) define EI as a personality disorder that is closely related to negative childhood experiences and is manifested in the desire to constantly meet other people's expectations. Disturbances in the functioning of neural mechanisms of the psyche are essential for the development of this phenomenon (Bution & Wechsler, 2016). Research



indicates that high ED is associated with domestic violence (Chafra-Quise & Lara-Machado, 2021) and an irrational desire to meet other people's needs (Moyeda et al., 2020). In young people, ED is associated with behavioural impulsivity, childhood trauma, and granting independence from parents (Estévez et al., 2018). The correlation of the phenomenon with distance anxiety and the search for social attention was recorded in students (Lemos et al., 2019).

Therefore, the study of EI and ED is a relevant direction of modern psychological and medical research. If we focus on the psychological aspect of the problem, the study of these phenomena opens up opportunities for optimizing the educational process in higher school. Clarifying the connection between students' EI and ED opens up opportunities to improve a number of theoretical models of pedagogy and psychology.

Methods and Materials

Let's analyse the key stages of the research:

1. The organizational stage involves the actions that determined the preparation for the collection and analysis of research data regarding the correlation between EI and ED. Cross section is a general strategy of actions. Communication with research participants was established in order to obtain adequate results from an academic and ethical perspective. The components of the studied phenomena are selected in accordance with the structure of the used methods and the analysed theoretical sources. The indicators of identification of emotions, use of emotions in activities, understanding of emotions, and conscious emotional management are distinguished as EI components. The ED components: emotional reliance on others, self-doubt, desire for autonomy. Two research hypotheses were determined: 1) the students' EI and ED components have statistically significant structural connections; 2) the nature of the correlation between EI and ED differs depending on the year of study in HEI. The stage took place during December–January 2023–2024.
2. Empirical stage – collection of research data. The stage involved conducting a diagnostic examination. The process of obtaining data took place in online interaction with prior communication with the participants. In this way, we could geographically cover a larger circle of subjects. If necessary, participants could withdraw from the study. All actions of the empirical stage were carried out in coordination with the administration of higher education institutions.
3. Stage of quantitative and qualitative processing of research data. Primary empirical profiles were calculated, i.e. individual results according to diagnostic methods were determined. Measurement scales and their types are defined. The procedure for calculating the percentages of the studied components was carried out. Correlation analysis was carried out.
4. The data interpretation stage — its main goal is drawing conclusions and their correlation with the objectives set at the beginning of the research. The work was based on a structural approach to explaining research information.

Instruments

The aim of the research were achieved through the selection of test methods based on their ease of use and the ability to quickly collect a large amount of empirical data. The MSCEIT was chosen, which has high validity and reliability indicators in the Ukrainian adaptation of the methodology (Shyron, 2022). The test is objective and contains a description of social situations that require an adequate solution from the respondent as stimulus material. The total duration of the test is 30–40 minutes. The research also used the Hirshfeld's Interpersonal Dependence Test adapted to Ukrainian (Hirschfeld et al., 1977). The questionnaire includes 48 subjective questions processed according to the general scale and subscales. The validity and reliability of the method was confirmed by expert evaluation of the instrument.



Sample

The study involved students from HEIs of different cities of Ukraine — Kyiv, Odesa, Kramatorsk, Sumy, Zhytomyr, Lviv, Ivano-Frankivsk. The sample was formed through personal communication of the authors of the study with the administration of educational institutions. In this way, direct access was obtained to the students with whom communication was carried out in order to involve them in the research. Four samples differentiated by the year of study were determined in order to fulfil the research objectives: 111 people (first year); 102 people (second year); 105 people (third year); 99 people (fourth year). The total sample is 417 people. The sample includes students who have reached the age of majority (above 18), so participation was determined by the students' informed consent. These students studied different majors: Secondary Education, Pedagogy, Philology, Architecture, etc. Master's students did not participate in the study, as they are characterized by a wide range of age differences at this level. So, it could affect the conclusions regarding the dynamics of the studied emotional components. All research participants stayed in Ukraine at the time of empirical data collection.

The data were collected online by entering stimulus material into Google forms. Detailed instructions were the key to effective use of the methods. The direct absence of the researcher during the collection of empirical material made it possible to avoid the Pygmalion effect and data deformation because of the attitude towards the experimenter. A total of 11 students refused to participate in the study during the use of the diagnostic tools. Their results are not taken into account in the final data processing.

The data analysis is aimed at determining the quantitative indicators of the dynamics and correlation of the studied components of the students' emotional sphere. Percentage trends of general parameters are presented graphically in the form of diagrams. This distribution is based on the scales of specific used diagnostic tools. Pearson's correlation analysis was used to determine the relationship between the EI and ED components. The data were processed in SPSS Statistics.

Results

The results of the diagnostics of EI and ED are presented in diagrams. The percentage distribution of each of the levels of the components of emotional sphere is graphically presented. The obtained results are analysed taking into account the fact that the research was conducted using a cross-sectional strategy. At the same time, attention is paid to the general integral indicators of the studied phenomena. Changes in general indicators of EI are presented in Figure 1.

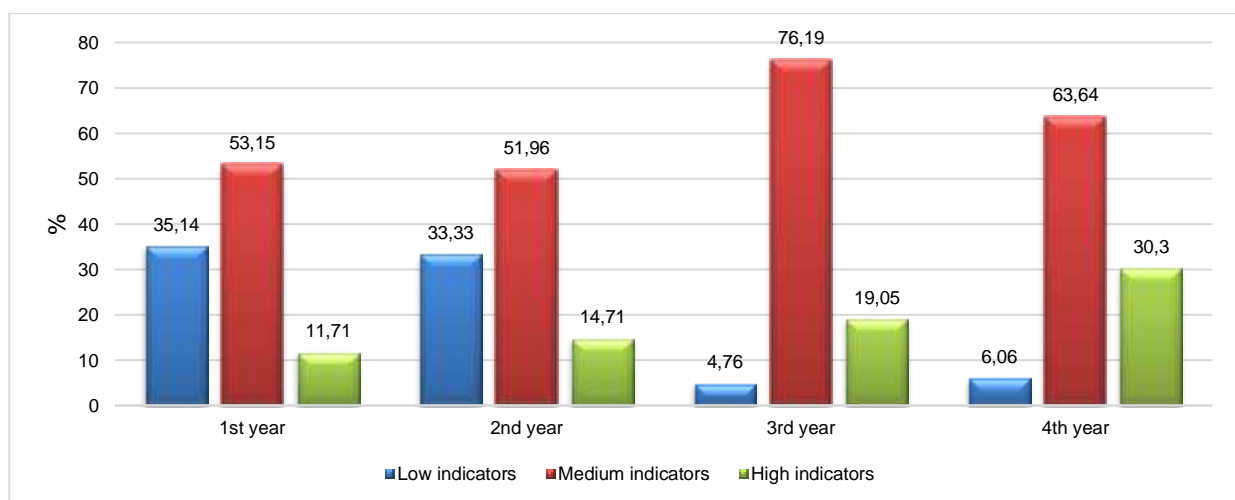


Figure 1. The dynamics of EI during the students' studies in HEIs

At the beginning of studies, more than a third of students have low indicators of the parameter. A small part of first-year students (11.71%) demonstrates a high ability to recognize and control emotions. More than half of the respondents have a medium level of EI. We connect the obtained results with changes in the social situation and processes of adaptation to study in HEIs. No significant changes in the parameter were found in the surveyed second-year higher school students compared to the previous sample. So, we can talk about a certain “plateau” in the EI dynamics during the first two years of study in the higher education system. In the third year, the percentage of people with medium indicators increases (by 24.23%). High indicators are also growing insignificantly (by 4.34%). At the same time, a decrease in the percentage of people with a low level of EI is recorded among third-year students. In the sample of the fourth-year bachelor’s students compared to the third-year students, the percentage of low indicators of the parameter almost did not change. High indicators increased by more than 10%. So, the performed diagnostics demonstrates the transformation of EI indicators between the second and third year of study. Changes in the students’ ED during their studies in HEIs are presented in Figure 2.

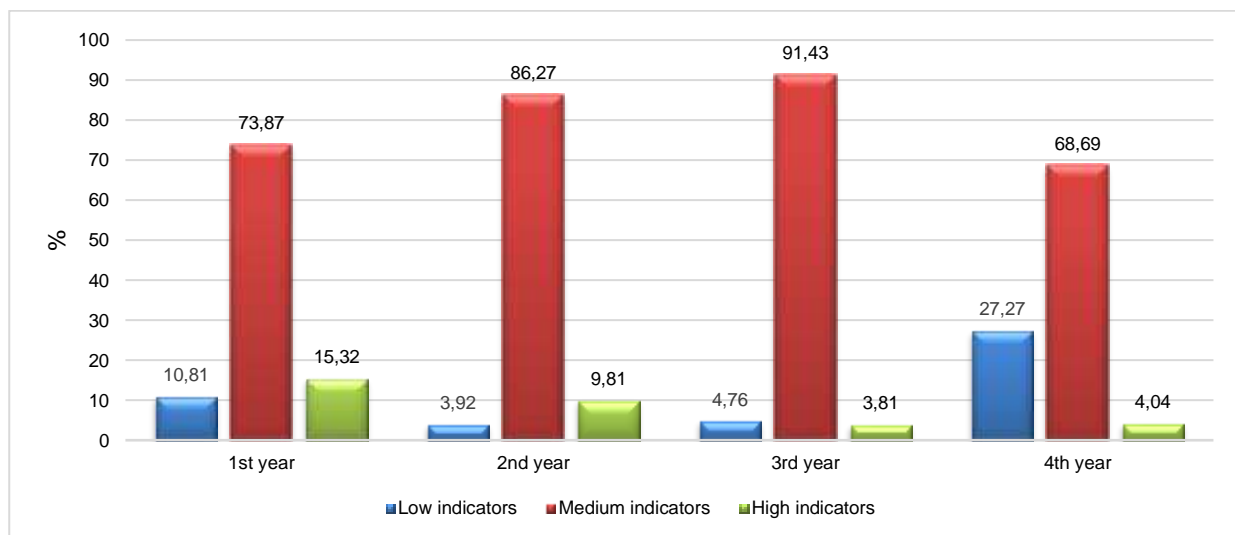


Figure 2. The ED dynamics during the students’ study in HEIs

There is a significant predominance of medium indicators among the first-year students. At the same time, the manifestations of low and high levels are similar: 10–15%. A further increase in the percentage of persons with a medium level of ED (more than 10%) was found among second-year students. The identified trend continues in the third year of the bachelor’s level. During the second and third year, a gradual decrease in the number of persons with high ED manifestations is recorded. Such indicators may indirectly indicate emotional pathology, therefore they require special attention of psychologists and teachers. In the fourth year, a rapid increase in the number of persons with a low level of ED is recorded among students. At the same time, high indicators remain unchanged. The main points of the dynamics of the studied parameter are the dominance of the medium level and the gradual growth of low manifestations of the component until the completion of studies in HEIs.

In the context of the aim of the research, the correlation coefficients between the EI and ED components are analysed below (Table 1).

Table 1.
Correlation matrix of parameters of students' EI with manifestations of ED

EI parameters	ED parameters		
	Emotional reliance on the environment	Self-doubt	Striving for autonomy
A sample of the first-year students			
Identification of emotions	0.022	-0.432**	0.009
The use of emotions in activities	0.329**	-0.092	0.112
Understanding emotions	0.001	-0.478**	0.054
Conscious management of emotions	0.107	-0.513**	0.442**
A sample of the second-year students			
Identification of emotions	0.109	-0.507**	0.093
The use of emotions in activities	0.404**	-0.033	0.121
Understanding emotions	0.039	-0.429**	0.068
Conscious management of emotions	0.131	-0.491**	0.399**
A sample of the third-year students			
Identification of emotions	0.038	0.145	0.296**
The use of emotions in activities	-0.109	0.430**	-0.002
Understanding emotions	-0.423**	-0.434**	0.049
Conscious management of emotions	-0.040	-0.521**	0.421**
A sample of the fourth-year students			
Identification of emotions	0.032	0.098	-0.119
The use of emotions in activities	0.025	0.010	-0.120
Understanding emotions	0.031	0.022	0.003
Conscious management of emotions	0.002	-0.398**	0.418**

The Identification of Emotions parameter reflects the ability to understand other people's experiences primarily due to the perception of non-verbal communication signals. In the first-year students, a significant inverse correlation of this component with self-doubt was found ($r=-0.432$). This means that the ability to identify emotions adds stability to the student in solving communicative situations. No significant correlations with the other two parameters were found in the first year. A similar trend is observed in the second-year students, but the strength of the inverse correlation is increasing ($r=-0.507$). In the sample of the third-year students, this correlation loses statistical significance. At the same time, a direct correlation coefficient of the ability to identify emotions with students' independence was established ($r=0.296$). In the sample of the fourth-year students, significant correlations of the ability to understand non-verbal communication with the ED components are felt. It is interesting that in all samples there is no significant correlation of the studied ability with indicators of reliance on the environment.

The use of emotions in activities and thinking characterizes the productivity of the realization of experiences to increase the effectiveness of achieving the students set goals. This component has direct relevant connections only with emotional reliance on the environment in the first-year students ($r=0.329$). The tendency increases in the second year. In the third year, this parameter is directly correlated with self-doubt ($r=0.430$). This means that the active realization of emotions in this period can have an disquieting neurotic nature. No significant correlation between the use of emotions in activities and ED components were recorded in the fourth year.

The Understanding of Emotions parameter reflects a person's ability to analyse complex emotional acts and their complexes. This EI property is actualized in the student period. In the first, second, and third years, this parameter is inversely correlated with self-doubt ($r=-0.478$; $r=-0.429$; $r=-0.434$). This means that the ability to understand other people is an important condition for a person's confidence and emotional stability. In the third year, inverse correlations with emotional reliance on the environment were found in the studied sample ($r=-0.423$). No significant correlations between the ability to understand emotions and the ED components were recorded with other parameters during the studied period.



Conscious Management of Emotions is an EI component that is responsible for controlling one's own experiences. Throughout the studied period, a stable trend of an inverse significant correlation of this component with self-doubt was recorded ($r=-0.513$; $r=-0.491$; $r=-0.521$; $r=-0.398$). This indicates the importance of emotional control to avoid emotional addiction in the student age. There is also a stable direct correlation of this EI parameter with the desire for autonomy in all four years of study ($r=0.442$; $r=0.399$; $r=0.421$; $r=0.418$). There are no significant correlations between the ability to consciously manage emotions and the phenomenon of emotional reliance on the environment during the studied period.

Discussion

The generalized research hypothesis is the statement that the students' EI and ED components have statistically significant structural correlations that change during higher education. In general, the results of the study confirm this assumption. A peculiar turning point in the genesis of the studied phenomena is the middle of the study period at the bachelor's level (second and third years of study). The results obtained during the research somewhat contradict the data of other studies, which demonstrated the prevalence of high indicators of the phenomenon in the student age (Kant, 2019). The dominance of medium indicators in the studied samples is explained by the socio-cultural context and fixation in different years of study. The consistent links of EI with self-confidence and autonomy support the notion of the phenomenon's impact on student well-being (Toscano-Hermoso et al., 2020). The students' ED manifests itself in social insecurity and is associated with impulsiveness of actions (Estévez et al., 2018). This position was one of the key positions for our research. The ability to understand oneself and the emotions of the social environment reduces the need to seek the attention of members of primary groups and blocks anxiety from experiencing loneliness (Lemos et al., 2019). The obtained data give grounds to state that students have sufficient self-development opportunities (Dias Alves et al., 2023), which gradually increase during their studies. At the same time, the destabilization of the emotional sphere is recorded in the first years, which we associate with the active adaptation of the personality to new social and educational conditions.

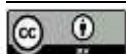
One of the main difficulties of our research was the selection of adequate diagnostic methods, which is associated with a large number of EI measurement methods based on various theoretical approaches (O'Connor et al., 2019). In the context of the issue under research, it is appropriate to plan and implement a special pedagogical impact focused on the development of the EI of higher school students (Gonzales, 2022). The basis of such actions should be the stimulation of awareness of one's own activities and the formation of confidence in social interaction (Kerins et al., 2020). It is also promising to develop classes on the formation of instrumental mechanisms for identification and understanding of the emotional sphere, social openness and tolerance (Care et al., 2018). In other words, students need to be provided with specific psychological tools that should optimize both the reflection of their own experiences and stimulate the impact on other people's emotions. In this context, it should be noted that professional psychotherapeutic influence based on work with negative childhood experiences of the individual is appropriate with high ED indicators (Zárate-Depraect et al., 2022).

Limitations

The results would more fully reveal the subject under research, provided that the direction of students' training is taken into account in the context of determining the connection between EI and ED. The accuracy of the results would increase due to the clarification of the gender aspect of the studied mental phenomena. A relevant criterion for the distribution of the studied samples is also the area of residence of higher school students, which is connected with experiencing hostilities in Ukraine.

Recommendations

- 1) Introduce selective training courses or fragments of the main educational components into educational programs for the purpose of building the competencies of identification and understanding of emotions by students;



- 2) Conduct regular diagnostic tests to record changes in the emotional sphere of higher school students;
- 3) Create and implement adaptation programmes for the first-year students based on data on the manifestations of students' EI and ED;
- 4) Build students' ability to argue their own position in the context of assertiveness development;
- 5) Not to suppress the manifestations of individuality of higher school students, especially in the context of public and educational activities;
- 6) Organize psychological clubs where films and literary works are analysed from the standpoint of understanding the emotional sphere of the characters;
- 7) Educate the psychological culture of the subjects of the educational process, where the emotional self-control is of key importance.

Conclusions

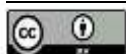
There is almost no data on the connection between EI and ED in the student period in psychological science, which urges the theoretical significance of the relevant research. The practical significance of the study is determined by its focus on changing higher education towards increased humanization and individualization. During the studied period, medium indicators of EI and manifestations of ED prevail. A significant transformation of EI is observed between the second and third year of study. The ED reactions gradually decrease until the completion of studies in HEIs. Significant correlations of the ED parameters with the conscious management of emotions, the ability to understand and identify experiences were recorded. Most often, the connections between the EI components are manifested with the level of self-confidence. It can be said that high EI indicators determine a decrease in ED. By the end of the training, the importance of controlling the emotional sphere for reducing the symptoms of ED increases, while the correlation of components of ED with other components of EI is minimized. The obtained results have practical significance in the context of creating effective psychological assistance programmes for participants in the educational process in higher education. In particular, the obtained data can increase the effectiveness of programmes for building stress resistance and overcoming students' anxiety in the educational process and interpersonal interaction. The research prospects include the development and verification of the effectiveness of programmes for EI development at student age.

Bibliographic References

- Altwijri, S., Alotaibi, A., Alsaheed, M., Alsalim, A., Alatiq, A., Al-Sarheed, S. ... & Omair, A. (2021). Emotional intelligence and its association with academic success and performance in medical students. *Saudi Journal of Medicine & Medical Sciences*, 9(1), 31-37. https://doi.org/10.4103/sjmms.sjmms_375_19
- Arbinaga, F., Mendoza Sierra, M.I., Caraballo-Aguilar, B.M., Buiza-Calzadilla, I., Torres-Rosado, L., Bernal-López, M. ... & Fernández-Ozcorta, E.J. (2021). Jealousy, violence, and sexual ambivalence in adolescent students according to emotional dependency in the couple relationship. *Children*, 8(11), 993. <https://doi.org/10.3390/children8110993>
- Bhat, Y.I., & Khandai, H. (2016). Social intelligence, study habits and academic achievements of college students of district Pulwama. *Research of Humanities and Social Sciences*, 6(7), 35-41. Retrieved from <https://www.iiste.org/Journals/index.php/RHSS/article/view/30271>
- Bornstein, R. F. (2011). An interactionist perspective on interpersonal dependency. *Current Directions in Psychological Science*, 20(2), 124-128. <https://doi.org/10.1177/0963721411403121>
- Bru-Luna, L.M., Martí-Vilar, M., Merino-Soto, C., & Cervera-Santiago, J.L. (2021). Emotional intelligence measures: A systematic review. *Healthcare*, 9(12), 1696. <https://doi.org/10.3390/healthcare9121696>
- Bunce, L., Lonsdale, A.J., King, N., Childs, J., & Bennie, R. (2019). Emotional intelligence and self-determined behaviour reduce psychological distress: Interactions with resilience in social work students in the UK. *The British Journal of Social Work*, 49(8), 2092-2111. <https://doi.org/10.1093/bjsw/bcz008>
- Bution, D.C., & Wechsler, A.M. (2016). Emotional dependency: A systematic review of literature. *Estudos Interdisciplinares em Psicologia*, 7(1), 77-101. Retrieved from <https://acortar.link/3mpV82>

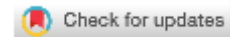


- Caleon, I.S., Ilham, N.Q.B., Ong, C.L., & Tan, J. P.-L. (2019). Cascading effects of gratitude: A sequential mediation analysis of gratitude, interpersonal relationships, school resilience and school well-being. *The Asia-Pacific Education Researcher*, 28(4), 303-312. <https://doi.org/10.1007/s40299-019-00440-w>
- Camacho-Morles, J., Slemp, G. R., Pekrun, R., Loderer, K., Hou, H., & Oades, L. G. (2021). Activity achievement emotions and academic performance: A meta-analysis. *Educational Psychology Review*, 33(3), 1051-1095. <https://doi.org/10.1007/s10648-020-09585-3>
- Care, E., Kim, H., Vista, A., & Anderson, K. (2018). *Education system alignment for 21st century skills: Focus on assessment*. Washington, DC: Center for Universal Education at The Brookings Institution.
- Gonzales-Castro, A., Riveros Anccasi, D., Terrazo Luna, E. G., Eustaquio Flores Apaza, E., & Oré Rojas, J. J. (2022). Dependencia emocional en estudiantes universitarios en aislamiento social obligatorio por Covid-19. *Revista San Gregorio*, 1(52), 115-125. <https://doi.org/10.36097/rsan.v0i52.2147>
- Cejudo, J., López-Delgado, M. L., & Losada, L. (2019). Effectiveness of the videogame “Spock” for the improvement of the emotional intelligence on psychosocial adjustment in adolescents. *Computers in Human Behavior*, 101, 380-386. <https://doi.org/10.1016/j.chb.2018.09.028>
- Chafla-Quise, N.M., & Lara-Machado, J.R. (2021). Emotional dependence and violence in women attending the Nosotras con Equidad Foundation in Riobamba. *Revista Médica Electrónica*, 43(5), 1328-1344. Retrieved from https://revmedicaelectronica.sld.cu/index.php/rme/article/view/4346/pdf_961
- Diachenko, I., Kalishchuk, S., Zhylin, M., Kyyko, A., & Volkova, Y. (2022). Color education: A study on methods of influence on memory. *Heliyon*, 8(11), e11607. <https://doi.org/10.1016/j.heliyon.2022.e11607>
- Dias Alves, F., Pires Peixoto Camacho, T., & Euler da Silva Reis, E. (2023). Emotional dependency and the impacts on the lives of people: An integrative literature review. *International Journal of Scientific Research*, 12(08), 5-9. <https://doi.org/10.36106/ijrsr/9026692>
- Estévez, A., Chávez-Vera, M.D., Momeñe, J., Olave, L., Vázquez, D., & Iruarrizaga, I. (2018). The role of emotional dependence in the relationship between attachment and impulsive behavior. *Anales de Psicología*, 34(3), 438-445. <https://doi.org/10.6018/analesps.34.3.313681>
- Goleman, D. (2009). *Emotional intelligence: Why it can matter more than IQ*. London: Bloomsbury Publishing Plc. Retrieved from <https://www.bloomsbury.com/uk/emotional-intelligence-9781408806203/>
- Gonzales, M. (2022). Helping students to develop emotional intelligence. In: *Emotional intelligence for students, parents, teachers and school leaders* (pp. 377-401). Singapore: Springer, https://doi.org/10.1007/978-981-19-0324-3_16
- Hirschfeld, R. M. A., Klerman, G. L., Gough, H. G., Barrett, J., Korchin, S. J., & Chodoff, P. (1977). A measure of interpersonal dependency. *Journal of Personality Assessment*, 41. http://dx.doi.org/10.1207/s15327752jpa4106_6
- Iqbal, J., Asghar, M.Z., & Ashraf MA, Yi. X. (2022). The impacts of emotional intelligence on students’ study habits in blended learning environments: The mediating role of cognitive engagement during COVID-19. *Behavioral Sciences*, 12(1),14. <https://doi.org/10.3390/bs12010014>
- Kant, R. (2019). Emotional intelligence: A study on university students. *Journal of Education and Learning (EduLearn)*, 13(4), 441-446. <https://doi.org/10.11591/edulearn.v13i4.13592>
- Kerins, J., Smith, S.E., Phillips, E.C., Clarke, B., Hamilton, A.L., & Tallentire, V.R. (2020). Exploring transformative learning when developing medical students’ non-technical skills. *Medical Education*, 54(3), 264-274. <https://doi.org/10.1111/medu.14062>
- Kotsou, I., Mikolajczak, M., Heeren, A., Grégoire, J., & Leys, C. (2019). Improving emotional intelligence: A systematic review of existing work and future challenges. *Emotion Review*, 11(2), 151-165. <https://doi.org/10.1177/1754073917735902>
- Lemos, M., Vázquez, A.M., & Román-Calderón, J.P. (2019). Potential therapeutic targets in people with emotional dependency. *International Journal of Psychological Research*, 12(1), 18-27. <https://doi.org/10.21500/20112084.3627>



- Mayer, J. D., Salovey, P., & Caruso, D. R. (2004). Emotional intelligence: Theory, findings, and implications. *Psychological Inquiry*, 15(3), 197-215. https://doi.org/10.1207/s15327965pli1503_02
- Moyeda, I. X., Ojeda, F. J., Velasco, A., & Luquin, E. W. (2020). Emotional dependence and love myths in students from two educational levels. *Revista Iberoamericana de psicología*, 12(3), 21-32. <https://doi.org/10.33881/2027-1786.rip.12303>
- O'Connor, P.J., Hill, A., Kaya, M., & Martin B. (2019). The measurement of emotional intelligence: A critical review of the literature and recommendations for researchers and practitioners. *Frontiers in Psychology*, 10, 1116. <https://doi.org/10.3389/fpsyg.2019.01116>
- O'Toole, V., & O'Flaherty, J. (2022). The role of emotion in higher education: Exploring global citizenship education. *Irish Educational Studies*, 1-19. <https://doi.org/10.1080/03323315.2022.2135565>
- Petrides, K. V., Mikolajczak, M., Mavroveli, S., Sánchez-Ruiz, M.-J., Furnham, A., & Pérez-González, J.-C. (2016). Recent developments in trait emotional intelligence research. *Emotion Review*, 8(4), 335-341. <https://doi.org/10.1177/1754073916650493>
- Quílez-Robres, A., Usán, P., Lozano-Blasco, R., & Salavera, C. (2023). Emotional intelligence and academic performance: A systematic review and meta-analysis. *Thinking Skills and Creativity*, 49, 101355. <https://doi.org/10.1016/j.tsc.2023.101355>
- Shafait, Z., Khan, M.A., Sahibzada, U.F., Dacko-Pikiewicz Z., & Popp, J. (2021). An assessment of students' emotional intelligence, learning outcomes, and academic efficacy: A correlational study in higher education. *PLoS One*, 16(8), e0255428. <https://doi.org/10.1371/journal.pone.0255428>
- Shyron, Yu. (2022). MSCEIT emotional intelligence test: Description, validization and adaptation. *Galician Economic Journal*, 74(1), 141-151. https://doi.org/10.33108/galicianvisnyk_tntu2022.01.141
- Toscano-Hermoso, M.D., Ruiz-Frutos, C., Fagundo-Rivera, J., Gómez-Salgado, J., García-Iglesias, J.J., & Romero-Martín, M. (2020). Emotional intelligence and its relationship with emotional well-being and academic performance: The vision of high school students. *Children*, 7(12), 310. <https://doi.org/10.3390/children7120310>
- Tretiak, O. P., Melenets, L. I., Shcherbyna, V. M., Poliakova, O. V., & Kravchuk, L. V. (2021). The role of instilling moral values in primary schoolchildren. *Revista De La Universidad Del Zulia*, 12(35), 37-62. <https://doi.org/10.46925/rdluz.35.03>
- Zárate-Depraect, N.E., Flores-Flores, P., Martínez-Aguirre, E.G., Alvarado-Félix, E., & Jimenez-Ramirez, C.R. (2022). Emotional dependence in medical students. *Revista Medica Herediana*, 33(2), 128-132. <https://doi.org/10.20453/rmh.v33i2.4246>




DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.16>

Cómo citar:


Bilichenko, A., Martynenko, N., Derevianko, L., Mizina, O., & Iatsyna, M. (2024). The effectiveness of interactive online courses for the speech competence development in non-language-major students. *Revista Eduweb*, 18(3), 204-222. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.16>

The effectiveness of interactive online courses for the speech competence development in non-language-major students


Eficacia de los cursos interactivos en línea para el desarrollo de la competencia lingüística en estudiantes no licenciados en idiomas

Alla Bilichenko <https://orcid.org/0000-0003-1569-3834>
alla1.Bilichenko22@gmail.com


Bila Tserkva National Agrarian University, Bila Tserkva, Ukraine.

Nadiia Martynenko <https://orcid.org/0000-0002-5695-4685>
nadiia.hope.p@gmail.com


Flight Academy of the National Aviation University, Kropyvnytskyi, Ukraine.

Liudmyla Derevianko <https://orcid.org/0000-0001-6271-6571>
Derevyanko28.adyl@gmail.com

National University "Yuri Kondratyuk Poltava Polytechnic", Poltava, Ukraine.

Olha Mizina <https://orcid.org/0000-0002-1988-6353>
Olamizina16@gmail.com

National University "Yuri Kondratyuk Poltava Polytechnic", Poltava, Ukraine.

Maksym Iatsyna <https://orcid.org/0000-0001-5512-5378>
M.iatsyna24@icloud.com

Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine.

Recibido: 01/08/24

Aceptado: 28/09/24

Abstract

Interactive online courses are becoming increasingly popular among students studying foreign languages. The aim of the article is to analyse the effectiveness of interactive online courses in the speech competence development of non-language-major students. Research methods included student surveys, testing before and after the interactive online courses, mathematical statistics methods (t-test, Likert scale). The testing showed a significant improvement in the results of the experimental group (EG) that studied using interactive online courses (B2 – 43.5% of students, C1 – 21.7%, C2 – 21.7%). Online courses were found to provide valuable opportunities for real language practice with an average score of 3.6. The user interface and features were found to be user-friendly and easy to navigate, with an average score of 3.5. The variety of topics covered in the interactive online courses was identified as beneficial for general language skills, with an average score of 3.6. Flexibility in study planning was consistent with the benefits, receiving a high mean score of 3.8. The practical value of these results



is their ability to improve the practice of foreign language learning. The results provide important insights into the effectiveness of interactive online courses.

Keywords: Interactive methods, learning efficiency, speaking competence, online courses, immersive learning, non-linguistic majors.

Resumen

Los cursos interactivos en línea son cada vez más populares entre los estudiantes de lenguas extranjeras. El objetivo de este artículo es analizar la eficacia de los cursos interactivos en línea en el desarrollo de las competencias lingüísticas de los estudiantes no licenciados en idiomas. Los métodos de investigación incluyeron encuestas a los estudiantes, pruebas antes y después de los cursos interactivos en línea, métodos estadísticos matemáticos (prueba t, escala de Likert). Las pruebas mostraron una mejora significativa en los resultados del grupo experimental (GE) que estudió utilizando cursos interactivos en línea (B2 - 43,5% de los estudiantes, C1 - 21,7%, C2 - 21,7%). Se comprobó que los cursos en línea ofrecían valiosas oportunidades para la práctica real del idioma, con una puntuación media de 3,6. La interfaz de usuario y las funciones resultaron fáciles de usar y navegar, con una puntuación media de 3,5. La variedad de temas tratados en los cursos interactivos en línea se consideró beneficiosa para las competencias lingüísticas generales, con una puntuación media de 3,6. La flexibilidad en la planificación del estudio fue coherente con los beneficios, recibiendo una alta puntuación media de 3,8. El valor práctico de estos resultados es su capacidad para mejorar la práctica del aprendizaje de lenguas extranjeras. Los resultados aportan información importante sobre la eficacia de los cursos interactivos en línea.

Palabras clave: Métodos interactivos, eficacia del aprendizaje, competencia oral, cursos en línea, aprendizaje inmersivo, carreras no lingüísticas.

Introduction

Innovative technologies are radically changing the education system, primarily the field of teaching English in universities in the modern world. Global issues and challenges related to this process have important implications for the educational system as a whole (Tursunovich, 2022). Digital transformation in higher education is becoming an integral part of the learning process, providing both new opportunities and serious challenges. The studies show that the integration of technology in education requires not only technical readiness, but also changes in approaches to learning and perception of the learning process (Baidoo-Anu & Ansah, 2023).

One of the key challenges is the need to adapt traditional teaching methods to the possibilities of modern technologies. The use of interactive online platforms, web conferencing, e-learning materials and educational programmes is becoming an integral part of the learning process (Gopal et al., 2021). However, the successful integration of these technologies requires not only the technical competence of teachers, but also a change in the pedagogical approach (Crawford et al., 2020). Changes in teaching methods involve a transition from the traditional lecture format to a more interactive, active communication of students. Research also emphasizes the need to ensure accessibility and inclusiveness of education when using technology (Rojabi, 2020). This requires not only updating the technical resources of universities, but also training teachers in new teaching methods with a view to modern educational technologies (Tinh et al., 2021).

An important aspect is also the assessment of the effectiveness of new teaching methods using technology. The use of online tools implies changes in the system of assessment and control of knowledge. Educators and institutions need to develop effective assessment methods that take into account the features of distance learning and digital technologies (Zhou et al., 2020). Universities around the world have a diversity of students from different cultural and linguistic backgrounds. This creates challenges for effective learning (Zhylin et al. 2023). The development of strategies that facilitate adaptation to a multilingual and multicultural context becomes a key issue. In the current conditions of globalization and world trends in the development of education, universities face complex challenges related to the provision of educational



services at the global level. This process requires educational institutions to develop flexible strategies that can adapt to the diversity of students and meet the modern requirements of the global labour market (Sari & Wahyudin, 2019).

The globalization of education leads to an increasing number of students from different countries, with different cultural and linguistic backgrounds in universities. This requires the implementation of personalized educational strategies that take into account the students' diverse needs and learning preferences. The teaching staff and curricula must be able to effectively interact with such a diverse student population, requiring the development of methods that promote inclusion and adaptation (Gunawan et al., 2020). Global changes in the economy and technology affect the needs of the labour market. Universities must adapt their curricula in such a way that graduates possess not only language skills, but also competencies that are in demand around the world. This includes the development of communication skills, critical thinking, intercultural competence and teamwork skills (Albashtawi & Al Bataineh, 2020). According to the studies, today's students expect not only language skills from a university education, but also the development of skills necessary for a successful career. Curricula should effectively integrate language learning with the development of key competencies (Albiladi & Alshareef, 2019).

The main prerequisite for successful adaptation of universities to changes related to technological transformation is the level of technology readiness of teachers and students. The quality of learning and interaction in the learning environment depends on how effectively they are able to use modern educational technologies (Coman et al., 2020). A lack of technological literacy can hinder the successful integration of digital tools into the learning process. Therefore, there is a need for systematic education and training of teachers, as well as support for students in mastering new technologies for their maximum use for educational purposes.

Successful preparation of students to work in a multilingual and multicultural environment is becoming increasingly important in the context of globalization. University graduates must not only have excellent language skills, but also be prepared to communicate with people from different cultures and understand different work styles and values. This requires the development of educational programmes that include the use of interactive online courses and an emphasis on the development of soft skills such as communication, adaptability, and cultural awareness (Gustanti & Ayu, 2021). This paper addresses the gaps in earlier studies, presents a new perspective, and aims to contribute to the development of knowledge in the field of English language teaching.

The aim of the research is to study the effectiveness of interactive online courses for the development of speech competence in non-language-major students.

Research objectives:

1. Conduct preliminary testing of students to determine their initial level of knowledge of the English language.
2. Analyse how learning through interactive online courses on various platforms affects the improvement of students' speech competence.
3. Analyse and compare the educational achievements of students who used interactive online courses with the results of students who studied using traditional methods.
4. Collect and compare feedback from students about the experience of working with the proposed methods.
5. Describe the aspects that students identify as the main benefits of interactive online courses after training.

The use of interactive online language learning courses has gained momentum across various disciplines due to their adaptability, flexibility, and ability to cater to diverse learning needs. These courses provide learners with access to personalized instruction, real-time feedback, and opportunities to engage in



language practice in ways that traditional classroom settings might not offer. While interactive online courses have proven to be effective in language programs, less is known about their impact on students in non-language majors. Such students, who often lack extensive exposure to language learning, may benefit from tailored approaches that focus on developing their speech competence. This gap in research provides the foundation for the current study.

Rationale for the Study

Investigating the effectiveness of interactive online courses for non-language majors is important for several reasons. First, non-language majors typically do not receive extensive language training as part of their curriculum, which may lead to limited opportunities for developing speech competence. Yet, in today's globalized and interconnected world, communication skills are critical, regardless of the academic or professional field. Second, non-language students may approach language learning differently from their peers in language-focused programs, presenting unique challenges and learning needs. Understanding how interactive online courses can address these specific needs is essential for improving educational strategies in non-language disciplines.

Article Structure

The article is divided into several sections.

- **Literature Review:** This section provides an overview of prior research on interactive online language learning technologies and their application to language development. It also examines the unique needs of non-language-major students and how these needs can be addressed through online platforms.
- **Methodology:** In this section, the study design, sample selection, and data collection methods are discussed in detail. The section outlines the tools used for evaluating speech competence, including pre-tests and post-tests.
- **Results and Discussion:** This section presents the findings from the study, analyzing the improvements in students' speech competence and exploring the implications of these results. Comparisons are made between different learner groups, highlighting the effectiveness of interactive courses.
- **Conclusion and Recommendations:** The final section summarizes the key findings and provides recommendations for future research and practical applications, particularly in educational settings where non-language majors may benefit from enhanced speech training through online platforms.

By focusing on how interactive online courses can support non-language-major students in speech development, this study aims to contribute valuable knowledge to the evolving field of technology-enhanced education.

Literature Review

Research in the field of English language teaching in universities focuses on adaptation to changes caused by the informatization process. The following common trends are observed in world literature: the use of technologies in the educational process, the introduction of online platforms and electronic resources in education. In the USA, Great Britain and other developed countries, much attention is paid to the integration of technology into the educational process to improve the quality of education. Research in these countries ranges from the use of interactive learning platforms to the development of new learning formats (La Velle et al., 2020). The situation is, however, more diverse in the context of developing countries.

Some of these countries are actively implementing distance learning and extensively use online platforms to improve access to education and overcome geographic barriers. This is especially relevant where the level of technological readiness of society enables the use of modern educational innovations (Goksu, 2021). On the other hand, some countries face limitations such as insufficient technological infrastructure, limited Internet access, and cultural differences. In these cases, the introduction of new methodologies and



technologies may be slower, and the transformation of educational practices requires additional efforts and adaptations.

Conflicts in the field of English language teaching in universities can be manifested in the issues of effective integration of technologies in the educational process. Some researchers and educators may emphasize the use of modern learning tools such as interactive online platforms, virtual classrooms, and mobile applications as means of actively engaging students (Kasneji et al., 2023). Others may follow traditional methods, emphasizing the importance of personal interaction and classroom learning. These contradictions may raise issues of effectiveness, accessibility and teacher preparation for the use of modern technologies in teaching English (Lapitan et al., 2021). Another aspect of the conflict is the issue of maintaining a balance between traditional and modern teaching methods (Simanjuntak et al., 2022).

Another aspect of the conflict is the understanding of the role of language learning in the context of informatization and its impact on the quality of students' communication. Some researchers may focus on the development of language skills through technological tools, while others may question the effectiveness of electronic tools in achieving high levels of communication skills. Conflicts can arise when evaluating the impact of technology on improving or weakening students' language and communication competence (Murray & Christison, 2019). One of the identified gaps in research on adaptation to changes in the informatization of university education is insufficient attention to cultural and linguistic aspects. In particular, there is a risk of insufficient inclusion of intercultural aspects in the development and implementation of new technologies in the learning process (Dewaele et al., 2019). This gap can lead to an underestimation of the cultural context of students and teachers, which can affect the effectiveness of educational programmes and tools in different cultural environments.

Another limitation may be the limited understanding of how information-related changes affect students with different levels of language proficiency. Research may remain insufficient to analyse how technological changes affect the language skills, learning characteristics, and communication abilities of different groups of students. This limitation can reduce the generalizability of the results and make it difficult to develop approaches that are specifically targeted to the needs of different language groups (Nartiningrum & Nugroho, 2020).

The researchers analysed the impact of different types of communication on student motivation and satisfaction in the context of online language learning (Bailey et al., 2021). The results showed that synchronous communication, such as video conferencing and real-time chats, facilitates a greater level of interaction between students and teachers. This increases their internal motivation and satisfaction with the learning process. Students noted that the possibility of immediate feedback and active participation in discussions creates a sense of community and increases engagement in the learning process.

An additional limitation may arise from the limited scope of new methodologies and technologies that may not cover all aspects of language teaching. In some cases, research may focus on specific innovations without fully understanding their implications for different aspects of language education. This can complicate the development of universal adaptation strategies and limit the applicability of research findings in different educational contexts (Macaro et al., 2018). Addressing these limitations requires a deeper analysis of cultural and linguistic factors in the development and implementation of technologies, as well as taking into account the individual characteristics of students with different language skills and cultural backgrounds.

Methods and Materials

This study utilized a mixed-methods approach, combining quantitative and qualitative data to evaluate the effectiveness of interactive online courses in improving the speech competence of non-language-major students. The research was designed to comprehensively assess the progression of students' language skills, with an emphasis on pronunciation, fluency, and comprehension. Both experimental and control



groups were utilized to ensure a comparative analysis of online versus traditional learning environments. A variety of data collection methods, including standardized tests, student surveys, and progress monitoring, were employed throughout the study. The use of multiple online platforms enabled the research to gather data on diverse teaching methods and their impact on speech competence development.

Research design

Empirical research was conducted in several stages. *The first stage* involved the selection of non-language-major students from different universities. *The second stage* provided for preliminary testing to assess the initial level of students' speech competence. *The third stage* is training based on interactive online courses in the EG and traditional offline classes in the control group (CG). *At the fourth stage*, students' progress was monitored. *The fifth stage* is final testing: after the course was completed, all students re-passed the same standardized test as at the beginning of the study. *The sixth stage* is data analysis.

So, the research design was carefully planned and implemented to ensure reliable and valid results. The study lasted one academic semester (4 months). The following interactive platforms with online courses for learning English were chosen for its implementation in the EG:

Duolingo is a popular free English language learning platform that uses interactive lessons and groups of exercises to engage students in learning (Figure 1). This will allow us to evaluate the effectiveness of online courses on a large amount of data.



Figure 1. An example of the Duolingo interface and tasks

Rosetta Stone uses an immersive learning method built on visual and audio methods without the use of translation (Figure 2). This platform can help in researching the impact of the immersion approach on language learning outcomes among students, which can be valuable information for our research.



Figure 2. Course example from Rosetta Stone

Coursera offers English language courses from universities around the world, including different teaching methods (Figure 3). This platform will allow us to evaluate the impact of academic approaches to English language learning, which can be useful for analysing the effectiveness of courses at the higher education level.

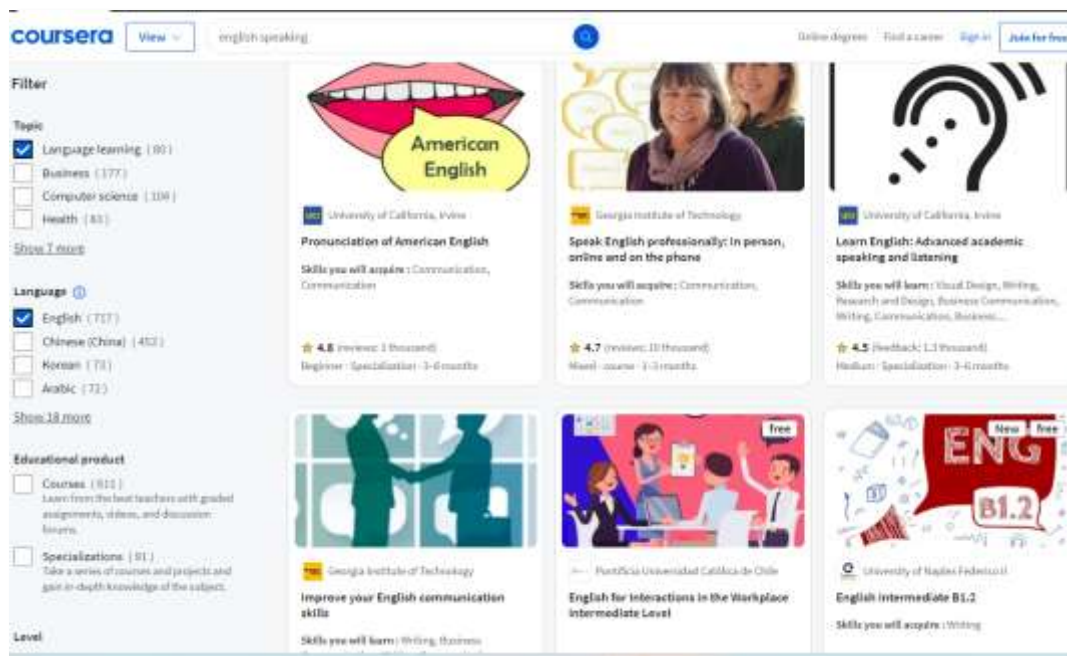


Figure 3. Course example from Coursera

Udemy is an online course platform where educators can create and deliver their own courses (Figure 4). This provides an opportunity to explore a variety of teaching methods and assess the impact of different approaches on student learning outcomes.

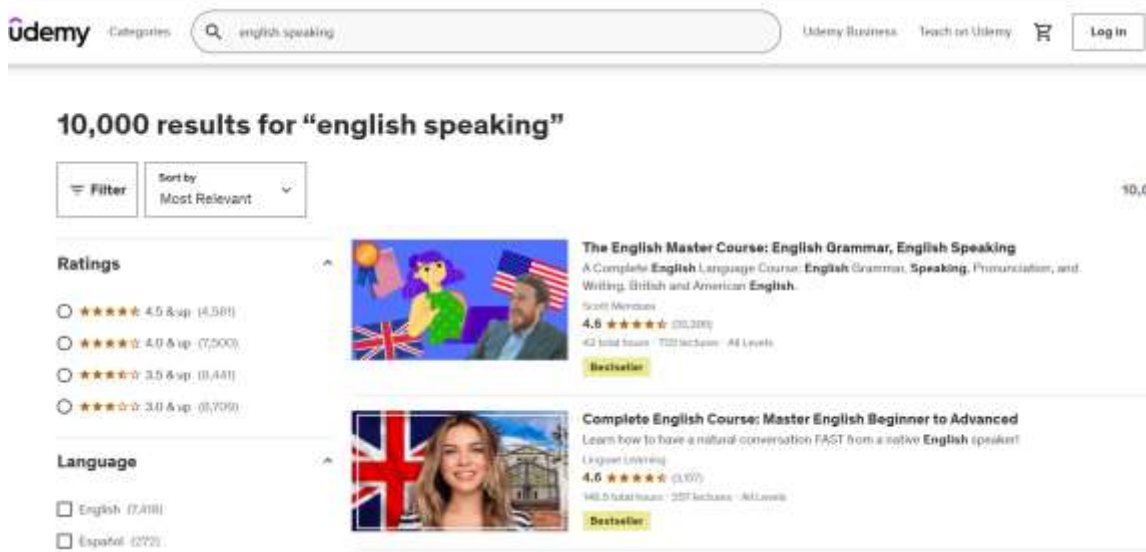


Figure 4. Example of courses from Udemy

The selected platforms provided an opportunity to collect data on their effectiveness in the context of our research on interactive online English language courses.

Sample

To study the effectiveness of interactive online courses for the development of speaking competence, a representative sample of students from 4 Ukrainian universities (Bila Tserkva National Agrarian University, National Aviation University, Yuri Kondratyuk Poltava Polytechnic National University, Vasyl Stefanyk Precarpathian National University) was selected. The sample included 345 undergraduate non-language-major students aged 19 to 25 studying Software Engineering, Economics, Aviation Transport, Law. Such a number of participants ensures high statistical significance of the results, which allows more accurate detection of differences between the EG and CG and reduces the probability of random errors. The choice of majors provides a variety of academic areas, which enables to study the effectiveness of interactive online courses in the context of different fields of knowledge and increases the overall representativeness of the study. Therefore, the selection criteria included: age, study in one of the indicated non-language major, basic level of English language proficiency. All students voluntarily agreed to participate in the study and signed an informed consent.

The training was conducted by 4 teachers from the language departments of the mentioned universities. The sample was randomly divided into two groups: the EG and the CG — 132 and 133 students, respectively. The distribution of students was carried out using the randomization method, which ensured an even distribution by gender, age and initial level of speech competence. The EG students completed a course of interactive online classes designed specifically for the development of speaking competence. The CG students continued their studies according to the traditional method, which included offline classes with a teacher according to the standard curriculum.

Before starting the study, all participants were pre-tested to determine their initial level of speech competence. This made it possible to compare the results before and after taking the courses and evaluate the effectiveness of different teaching methods.

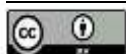
Research methods

The methodology used to evaluate the effectiveness of teaching English language students corresponded to the experimental design. The data were collected using pre- and post-tests on the level of spoken language proficiency in each group. They were conducted in the form of an Oral Proficiency Interview (OPI). This is a face-to-face interview between the student and the examiner via video conference. The examiner asked questions related to various aspects of language during the interview. The principles of reliability and competence were followed when collecting data. Student responses were evaluated based on criteria such as vocabulary use, grammatical accuracy, speaking speed, pronunciation, and coherence.

Questions of the Oral Proficiency Interview

1. Can you tell me a little bit about yourself and your background?
2. What motivated you to pursue your current field of study?
3. Can you describe a typical day in your life as a student?
4. What are your favourite subjects or courses, and why do you enjoy them?
5. Have you participated in any extracurricular activities or clubs? If so, can you describe your experience?
6. Have you travelled to any English-speaking countries? If yes, which ones and what was your experience like?
7. What do you find most challenging about learning English?
8. How do you practice your English skills outside of the classroom?
9. Can you tell me about a time when you had to use English in a real-life situation?
10. What are your career aspirations after you graduate, and how do you plan to achieve them?
11. Can you describe a project or assignment that you are particularly proud of?
12. How do you stay motivated and focused on your studies?
13. Can you describe a recent book, article, or documentary that you found particularly interesting?
14. How do you keep up with current events, especially those related to your field of study?
15. Can you discuss a current issue in your field and share your perspective on it?
16. What skills do you think are most important for success in your chosen career?
17. How do you handle stress and pressure, especially when you have multiple deadlines?
18. Can you tell me about a time when you worked as part of a team? What was your role and what did you learn from the experience?
19. Imagine you are at an international conference and meet a renowned expert in your field. How would you introduce yourself and what questions would you ask them?
20. What are some cultural differences you have noticed between your country and English-speaking countries?
21. How do you see technology influencing your field of study in the future?
22. Can you describe a situation where you had to solve a complex problem? How did you approach it and what was the outcome?
23. What do you think are the benefits of learning a second language?
24. Can you explain a concept or topic from your studies to someone who is not familiar with it?
25. What advice would you give to someone who is just starting to learn English?

The level of spoken language proficiency was assessed according to the standardized scale of The Common European Framework of Reference for Languages (CEFR), which ranges from A1 (Beginner) to C2 (Proficient). The content validity of the tests was checked during discussions with university professors included in the study. The discussion was held by e-mail. The final form of the questions was established after reaching agreement among all participants regarding the completeness of the coverage of the questions, the problems being studied, and the respondents' attitude to them. The survey was conducted online in Google Forms, which was sent to students by e-mail.



The methods of mathematical statistics: t-test (to assess the significant difference in results before and after using interactive online courses), Likert scale (to collect data by measuring the degree of agreement or disagreement of respondents with the statements on the scale).

Instruments

The tool for evaluating the students' experience working with the selected technologies was a 5-point Likert-type rating system, the points of which are distributed as follows: (1) "Strongly disagree", (2) "Disagree", (3) "Neutral", (4) "Agree" and (5) "Strongly Agree". The reliability of the survey was tested using Cronbach's alpha. The obtained result $\alpha = 0.769$ gives grounds to assess the internal consistency of the survey as sufficient for the study. Quantitative data were collected and calculated using the SPSS 26 computing tool. The effectiveness of the proposed model was studied using a t-test and the sample standard deviation to rule out differences between group surveys. The mean score of each Likert scale item was calculated to quantitatively analyse these data.

This study adopted a mixed-methods research design, combining both quantitative and qualitative data to provide a comprehensive evaluation of the effectiveness of interactive online courses on speech competence development in non-language-major students. The quantitative component involved pre- and post-test scores from standardized speech proficiency tests, specifically the Oral Proficiency Interview (OPI), and statistical analysis of the improvements in the experimental and control groups. The qualitative component included student surveys and feedback that offered insights into their learning experiences. The choice of a mixed-methods approach was justified by the need to capture both measurable changes in performance and the subjective learning experiences of students, providing a holistic view of the effectiveness of online learning.

Implementation of Online Courses

The interactive online courses in the experimental group were implemented over the course of one academic semester, which lasted four months. Students engaged in sessions for a duration of three hours per week, divided into two 90-minute sessions. Each online platform—Duolingo, Rosetta Stone, Coursera, and Udemy—was used in rotation to expose students to varied teaching methods and learning experiences. Duolingo was employed for interactive exercises, Rosetta Stone for immersive learning, Coursera for academic-style instruction, and Udemy for customized lessons. The integration of these platforms ensured a balanced and comprehensive approach to language learning, focusing on different aspects of speech competence, such as fluency, pronunciation, and comprehension.

Validity of Instruments

The Oral Proficiency Interview (OPI), a widely recognized standardized test for evaluating speech competence, was selected for pre- and post-test assessments due to its reliability and validity in measuring various aspects of speech proficiency. The OPI has been extensively validated in prior studies, particularly in assessing spoken language development in diverse educational contexts. Additionally, the surveys used to gather qualitative data were developed based on previously validated instruments, ensuring they accurately measured students' perceptions of their learning experiences and engagement.

Random Assignment of Participants

Participants were randomly assigned to either the experimental group (EG) or the control group (CG) using a computer-generated random number system. This randomization process ensured that each group was comparable in terms of initial language proficiency, background, and demographic factors. Stratified random sampling was also used to balance gender and academic background across both groups, further ensuring that the results were not influenced by demographic variables.



Control of External Variables

To ensure that external variables did not affect the outcomes, several control measures were implemented. The study controlled for prior language exposure, student motivation levels, and access to learning resources by administering preliminary surveys and adjusting for any significant differences through statistical methods such as covariance analysis (ANCOVA). Additionally, all students had access to the same technological tools (computers and stable internet) to avoid discrepancies caused by resource availability.

Ethical Considerations

The study adhered to strict ethical guidelines. All participants provided informed consent before participating in the study, with the purpose, procedures, and potential risks of the research clearly explained. Students were informed that their participation was voluntary and that they could withdraw from the study at any time without penalty. The data collected were anonymized to protect participants' privacy, and the study received approval from the university's ethics committee.

Control Group Structure

The control group received traditional offline instruction, which consisted of lectures, in-class discussions, and face-to-face interactions with teachers. The course content was identical to the online courses but delivered in a conventional classroom setting. The frequency and duration of lessons matched the experimental group, with three hours of instruction per week spread over two 90-minute sessions. This allowed for a direct comparison between the interactive online course structure and the traditional offline methods, highlighting the impact of delivery mode on speech competence development.

Results

The results of the pre- and post-tests showed the following percentage data (Table 1).

Table 1.
Results of pre- and post-tests

Proficiency Level	A1	A2	B1	B2	C1	C2	Total
Pre-test - CG	4.3%	13.0%	60.9%	17.4%	4.3%	0.0%	100%
Pre-test - interactive online courses	4.3%	8.7%	52.2%	26.1%	8.7%	0.0%	100%
Post-Test - CG	4.3%	13.0%	60.9%	17.4%	4.3%	0.0%	100%
Post-test - interactive online courses	0.0%	4.3%	26.1%	43.5%	21.7%	4.3%	100%

Source: developed by the author based on the collected data on the participants of the experiment

The stage of preliminary testing involved the CG participants with different levels of language proficiency. The distribution of language proficiency levels in the CG was as follows: 4.3% — at the A1 (Beginner) level, 13.0% — at the A2 (Elementary) level, 60.9% — at the B1 (Intermediate) level, 17.4% — at the B2 (Upper-Intermediate) level, and 4.3% — at the C1 (Advanced) level. None of the CG participants achieved the highest qualification level C2 (Proficient).

In the EG, which used interactive online courses in education, the distribution of language proficiency levels on the previous test was as follows: 4.3% were at the A1 level, 8.7% — at the A2 level, 52.2% — at the B1 level, 26.1% were at the B2 level, 8.7% were at the C1 level, and no participant reached the C2 level.

This information provides an overview of the initial levels of language proficiency of the participants in each group prior to the use of different language practice methods. Most of the CG students (60.9%) had B1 (Intermediate) level. This shows that the students in this group discussed common, everyday topics and



had basic conversations in English. The EG: the highest percentage (52.2%) of students in this group had B1 (Intermediate) level. The higher percentage of students with the B2 (Upper Intermediate) level (26.1%) indicates that they could engage in more complex conversations or discuss a wider range of topics.

Post-test indicators in the CG and EG are presented in Fig. 5. The percentage distribution of proficiency levels in the CG remained relatively constant in the post-test compared to the pre-test. This indicates that there was no significant improvement in the level of spoken language in the CG during the study.

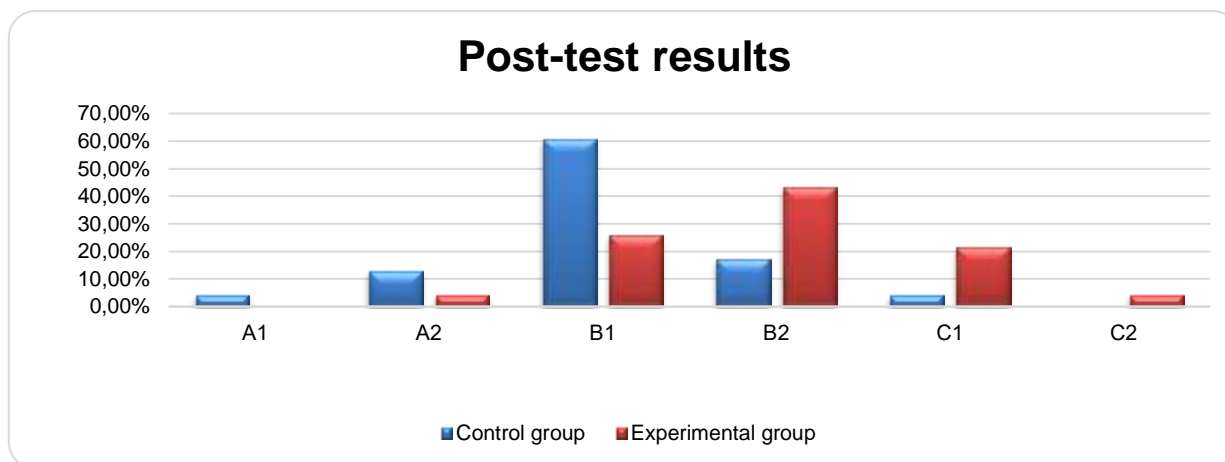


Figure 5. Post-test results in the CG

Source: developed by the author on the basis of collected data on the participants of the experiment

These results provide insight into the effectiveness of different methods. It is evident that there was a higher percentage of participants with higher levels of language proficiency (B2 and C1) compared to the CG due to the use of interactive online platforms (EG). This suggests that interactive online platforms were useful for improving the speech competence of non-language-major students. These results are based on the assumption that higher proficiency levels (B2 and C1) reflect improvement, while lower levels (A1 and A2) may indicate problems requiring attention.

Testing showed a significant improvement in the EG results group. This shows that the use of interactive online courses was found to be more effective in improving students' speech competence than traditional methods. The sample standard deviation (s) is approximately 0.45. A t value of approximately 13249 indicates a significant difference between the pre-test and post-test scores for the interactive online courses (EG). In a paired t-test, the t value measures the size of the difference relative to variability within the sample. The higher the t value, the more likely it is that the observed difference is not caused by the chance alone. In this case, a t value of 13249 suggests that the difference between pre-test and post-test scores is very significant and unlikely to be explained by random variation. It is important to note that the negative percentages ($\approx -50.0\%$ and $--16.7\%$) predict a decrease in the percentage of students at the B1 (average) level after the experiment in both groups. This may be related to the transition of students to higher levels of language proficiency (B2, C1, etc.), and not to a decrease in the general level of language proficiency.

Table 2 presents the results of evaluation of interactive online courses by students on a 5-point Likert scale.

Table 2.

Results of evaluation of interactive online courses by students (on a 5-point Likert scale)

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Interactive online courses are valuable opportunities for real language practice.	10	20	35	40	10
2. I have found that interacting with native speakers in online courses is helpful in improving my speech competence.	5	10	30	50	20
3. The user interface and features of the online course platforms were convenient and easy to use.	5	15	30	15	15
4. The variety of topics studied in the online courses improved my overall knowledge of the language.	10	15	25	40	25
5. The flexibility of scheduling classes in online courses matched my learning preferences.	5	10	20	40	40

Source: developed by the author on the basis of collected data on the participants of the experiment

An evaluation of interactive online courses compared to traditional learning revealed several key findings. First, they were effective in providing valuable opportunities for real language practice, with 75% of students agreeing. Special attention was paid to interaction with native speakers, which 50% of participants consider useful for improving speaking competence. Furthermore, the platform's user-friendly interface and features with interactive online platforms were positively perceived by 65% of students, contributing to their overall satisfaction. A total of 65% of students appreciated the variety of topics covered in online courses. Besides, the flexibility of lesson planning corresponded to the preferences of the majority (80%) of the participants. The mean score of each Likert scale item was calculated to quantitatively analyse these data (Table 3).

Table 3.

Average score of each Likert scale item

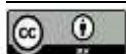
Criteria	Average Score (Out of 5)
Real-life practice	3.6
Interacting with Natives	3.69
User-friendly UI	3.5
Variety of topics	3.6
Scheduling flexibility	3.8

Source: developed by the author on the basis of collected data on the participants of the experiment

So, interactive online courses have their strengths: useful in real language practice, flexible schedule, and development of speech competence. Positive student feedback was received consistent with the OPI results. Improvements may include addressing the discomfort some students experience with providing feedback during traditional learning and improving the usability of interactive online platforms.

The interactive online courses proved to be more effective in improving the speech competence of non-language-major students compared to traditional offline methods. Several specific mechanisms likely contributed to this observed improvement:

- **Personalized Learning Paths:** One of the key advantages of online platforms such as Duolingo and Rosetta Stone is the ability to tailor learning paths to the individual needs and pace of each student. This personalized approach allowed students in the experimental group (EG) to focus more on areas where they struggled, enabling targeted improvement in pronunciation, fluency, and comprehension.



- Immediate Feedback and Interactivity: The interactive nature of these platforms, particularly the use of real-time feedback on exercises and quizzes, provided continuous reinforcement of correct language use. This immediate feedback loop was crucial for speech competence development, allowing students to correct mistakes in pronunciation or comprehension on the spot, rather than waiting for a teacher's feedback in traditional settings.
- Multimodal Learning Tools: Platforms like Rosetta Stone and Coursera utilized audio-visual materials, immersive exercises, and real-life scenarios, which engaged multiple senses. These multimodal tools can enhance memory retention and aid in the acquisition of more natural and fluent speech patterns, contributing to better overall competence.
- Flexibility and Autonomy: The online environment offered students greater flexibility in scheduling their study sessions, fostering a sense of autonomy. This likely increased motivation and engagement, factors that have been shown to improve learning outcomes.
- Peer Interaction and Gamification: Platforms like Duolingo incorporated elements of gamification (leaderboards, rewards) and peer competition, which may have increased student engagement. Moreover, tools that enabled peer interaction, even in a virtual space, created opportunities for collaborative learning, further enhancing speech competence.

The quantitative data were analyzed using analysis of variance (ANOVA) to compare the pre- and post-test scores of both the experimental and control groups. Significance levels (p-values) were set at 0.05, indicating that a difference between groups was considered statistically significant if the p-value was less than 0.05. The results showed that the experimental group demonstrated a statistically significant improvement in speech competence over the control group, with a p-value of 0.001, confirming that the interactive online courses had a stronger positive impact than traditional instruction. Additionally, effect sizes were calculated using Cohen's d to measure the magnitude of the difference between the groups. The effect size was 0.85, indicating a large effect according to conventional benchmarks, further supporting the superior efficacy of the online courses. Post-hoc analysis revealed that the experimental group improved more significantly in key areas such as pronunciation and fluency, where traditional teaching methods showed more modest gains. The results suggest that the immediacy of feedback and flexibility in the online courses contributed to these gains.

Discussion

The results of the study indicate the effectiveness of interactive online courses in improving students' speech competence. This shows the wide recognition and acceptance of online courses, which is proven not only in our study, but also in previous research. Duolingo's focus on pronunciation and its gamified approach to language learning make it attractive to students who want to learn effectively and have fun (Nelson & Bonnac, 2022). Our study notes a difference in the degree of popularity of digital platforms compared to previous studies where these platforms may have had higher ratings. This emphasizes that the chosen platforms may vary in popularity depending on the specific context and student needs (Novita, 2021).

One of the studies shows that individual differences in student preferences may be related to comfort levels with particular platforms and learning methods (Kasneji et al., 2023). This indicates the need to support individual choice and consider the diversity of approaches to learning in higher education (Ali & Abdalgane, 2022). Our research supports this finding, showing that the effectiveness of interactive online courses depends to a large extent on the ability of these platforms to take into account the students' individual needs and preferences. For example, some students may respond better to the gamified elements of Duolingo, while others may benefit more from structured academic courses on Coursera. The multi-approach platforms such as Rosetta Stone and Babbel are used for a more personalized learning experience that promotes speech competence.

General agreement with the conclusions about the high popularity of interactive online courses confirms the trends of digital education. These courses take an important place in student selection, reflecting generally accepted standards for using digital tools for learning and self-development (Kubaczka & Polok,



2023). Despite the differences in the selection of individual online courses, their lower popularity does not necessarily indicate the ineffectiveness of these platforms. Differences may be related to the context of use and the students' individual needs. The variety of platform choices points to the need to consider context and individual preferences when choosing digital learning tools (La Velle et al., 2020). It is important to understand that the choice of digital platforms is complex and depends on the specific environment in which they are used.

Differences in the choice may be determined by the specifics of the course, the structure of the study and the students' personal preferences. This emphasizes the importance of individualization and flexibility of the digital learning system. The opportunity to choose the right tools provides optimal conditions for each student. Active use of online courses for various assignments and tests is a standard practice among teachers (González-Lloret, 2020). This creates an interactive learning environment that engages students in the learning process. Our research found that interactive elements such as video lessons, language games, and dialogue exercises not only increase student engagement, but also improve their speaking skills. Online platforms such as Duolingo, Babbel, and EF English Live allow students to actively interact with the learning material, which promotes deeper assimilation of knowledge and skill development. So, our results demonstrate that the use of interactive online courses can be an effective tool for improving students' speech competence. They confirm that interactive learning methods, which are widely used by teachers, create a favourable environment for student engagement and increased learning efficiency.

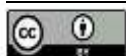
The results of the earlier study reveal that students show a higher level of satisfaction and motivation when using synchronous communication methods (video conferencing and real-time chats) (Bailey et al., 2021). Our research also found that interactive elements provide feedback, significantly increase the effectiveness of training. Accordingly, both studies emphasize the importance of interactive and engaging learning methods for improving students' speaking skills, which confirms the feasibility of using interactive online courses for this purpose.

The use of digital resources allows teachers to diversify tasks and create interactive scenarios for students (Goksu, 2021). This strengthens the relationship between the teacher and students, as well as intensify the educational process (Sari, 2020). A comparison of the results with similar studies identifies both similarities and differences in the level of improvement in students' speech competence. This indicates the need for flexibility in the integration of interactive online courses in language learning, taking into account the students' diverse needs and preferences of. The obtained results confirm the achievement of the determined aim and objectives of our research. Practical use implies improving English language training programmes among non-language-major students. Educational institutions and educators can integrate interactive online courses such as Duolingo, Babbel, Coursera, EF English Live and Udemy into their curricula to create a more effective learning environment. The use of various methods and platforms enables taking into account the students' individual needs and preferences, which will contribute to the improvement of their speech competence and general level of knowledge.

The findings of this study have several important practical implications for language teaching, particularly for non-language-major students. As the results show, interactive online courses proved to be more effective in improving speech competence compared to traditional offline methods. This suggests that integrating online learning platforms into non-language-major curricula could enhance language acquisition in several key ways:

1. Increased Accessibility and Flexibility

Non-language majors often have limited time to devote to language studies due to the demands of their primary discipline. Interactive online courses, which offer flexibility in scheduling and allow for self-paced learning, provide a practical solution. Students can fit language learning into their own schedules without the need for structured classroom sessions. This accessibility enables more consistent practice, which is critical for developing speech competence.



Personalized and Adaptive Learning Paths

Online platforms like Duolingo and Rosetta Stone offer adaptive learning technologies that tailor content to the learner's individual proficiency level and progress. This is particularly valuable for non-language majors, who may come from varying linguistic backgrounds and have different needs. By allowing students to focus on areas where they need the most improvement, these tools provide a more personalized learning experience than traditional classroom settings, where instruction may not be as easily customized.

2. Blended Learning Models

The success of online courses in this study suggests that universities could adopt **blended learning models**, where interactive online courses are used alongside traditional classroom teaching. For example, core components of speech competence, such as pronunciation drills or listening exercises, could be completed online, allowing instructors to focus on higher-level interactive activities, such as discussions or role-playing, in the classroom. This approach optimizes both time and resources, making language learning more efficient and tailored to individual students' needs.

3. Improving Engagement and Motivation

Platforms like Duolingo, which use gamification elements such as rewards, leaderboards, and daily goals, were found to significantly increase student engagement and motivation. For non-language majors, who might not initially see the relevance of language learning to their primary field, this added layer of interaction can foster a more positive attitude toward language acquisition. Increased motivation has been consistently linked to better learning outcomes, making these platforms especially useful in keeping non-language majors invested in their language studies.

4. Practical Application in Professional Contexts

The speech competence developed through these platforms has direct applications in professional environments. Non-language majors in fields such as business, engineering, or healthcare increasingly require strong communication skills in a global context. Interactive online courses, with their emphasis on practical, everyday language use, prepare students not only for academic success but also for professional interactions. This is particularly important for students who may not pursue further formal language education but will need these skills in international or multicultural work environments.

5. Scalability and Cost-Effectiveness

Another practical implication of the findings is that interactive online courses can be scaled more easily than traditional classroom instruction, particularly in large universities with limited language teaching staff. By incorporating online platforms, universities can provide quality language instruction to a larger number of non-language majors without the need for significant increases in faculty or physical classroom space. Additionally, many of these platforms are cost-effective, and in some cases, free, making them a financially sustainable option for institutions looking to expand their language offerings.

6. Alignment with Modern Educational Trends

The shift towards online and blended learning is in line with broader trends in higher education, where technology-enhanced learning is increasingly embraced. This study reinforces the value of such tools not only for language majors but for students across all disciplines. The implementation of online courses can also align with initiatives promoting digital literacy, self-directed learning, and lifelong learning, which are key competencies in today's rapidly changing professional landscape.

In conclusion, the integration of interactive online platforms into non-language-major curricula offers a range of benefits, from increased accessibility and flexibility to personalized learning and enhanced student



motivation. By embracing these technologies, educational institutions can better equip their students with the communication skills needed for both academic and professional success in an increasingly interconnected world.

Conclusions

The growing role of distance learning urges the need to determine the effectiveness of interactive online courses for the development of speech competence of non-language-major students. The pre- and post-test results showed that they led to a marked increase in the proportion of students with higher levels of language proficiency, especially at the B2 (Upper Intermediate) level. Interactive online courses were found to be more effective in improving students' speech competence than traditional instruction. The sample standard deviation (s) is approximately 0.45. A t value of approximately 13249 indicates a significant difference between the pre-test and post-test scores in the EG. It is important to note that the negative percentages ($\approx -50.0\%$ and -16.7%) predict a decrease in the percentage of students at the B1 (intermediate) level after the experiment in both groups.

This may be related to the students' transition to higher levels of language proficiency (B2, C1, etc.), and not to a decrease in the general level of language proficiency. Online courses scored higher on a Likert scale than traditional learning. Interactive online courses have been found to provide valuable opportunities for real-world language practice and interaction with native speakers, resulting in improved language skills. The user-friendly interface and capabilities of the programme, as well as the variety of topics covered, were also positively evaluated by students. Scheduling flexibility was well suited to students' learning preferences.

The study emphasizes the advantages of interactive online courses in improving students' speech competence. These findings can help to develop language learning programmes that incorporate these methods and identify areas to further improve students' language learning experiences.

Research limitations

Using the OPI as a language assessment method may not fully reflect language use or performance in real life. The interview format and potential pre-examination anxiety may influence participants' responses, which may result in differences from their actual proficiency in real-world situations. The research design reflects the level of communication competence of the participants before and after training, but cannot provide an idea of the long-term impact of interactive online courses.

Research prospects

- Study the long-term effects of interactive learning: studying how the knowledge and skills acquired during interactive online courses are retained and developed in students over time.
- Study the impact of personalized learning trajectories: development and testing of algorithms that automatically adapt educational materials according to the student's level of knowledge and learning style.

Recommendations

It is recommended to focus on the following aspects in order to improve the effectiveness of interactive online English language courses for non-language-major students. First, personalized learning trajectories that take into account the individual needs and learning style of each student shall be actively implemented. Furthermore, it is important to systematically monitor and evaluate the effectiveness of each learning module in order to identify the most effective approaches and teaching practices. It is also necessary to actively use combined learning models to ensure a balance between online and offline activities, which will contribute to the comprehensive development of students' speaking skills.

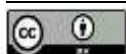


Bibliographic References

- Albashtawi, A., & Al Bataineh, K. (2020). The effectiveness of google classroom among EFL students in Jordan: An innovative teaching and learning online platform. *International Journal of Emerging Technologies in Learning (IJET)*, 15(11), 78-88. <https://doi.org/10.3991/ijet.v15i11.12865>
- Albiladi, W. S., & Alshareef, K. K. (2019). Blended learning in English teaching and learning: A review of the current literature. *Journal of Language Teaching and Research*, 10(2), 232-238. <http://dx.doi.org/10.17507/jltr.1002.03>
- Ali, R., & Abdalgane, M. (2022). The impact of gamification “Kahoot app” in teaching English for academic purposes. *World Journal of English Language*, 12(7), 18-27. <http://dx.doi.org/10.5430/wjel.v12n7p18>
- Baidoo-Anu, D., & Ansah, L. O. (2023). Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning. *Journal of AI*, 7(1), 52-62. <http://dx.doi.org/10.61969/jai.1337500>
- Bailey, D., Almusharraf, N., & Hatcher, R. (2021). Finding satisfaction: Intrinsic motivation for synchronous and asynchronous communication in the online language learning context. *Education and Information Technologies*, 26(3), 2563-2583. <https://doi.org/10.1007/s10639-020-10369-z>
- Coman, C., Țîru, L. G., Meseșan-Schmitz, L., Stanciu, C., & Bularca, M. C. (2020). Online teaching and learning in higher education during the Coronavirus pandemic: Students' perspective. *Sustainability*, 12(24), 10367. <https://doi.org/10.3390/su122410367>
- Crawford, J., Butler-Henderson, K., Rudolph, J., Malkawi, B., Glowatz, M., Burton, R. ... & Lam, S. (2020). COVID-19: 20 countries' higher education intra-period digital pedagogy responses. *Journal of Applied Learning & Teaching*, 3(1), 1-20. <http://dx.doi.org/10.37074/jalt.2020.3.1.7>
- Dewaele, J. M., Chen, X., Padilla, A. M., & Lake, J. (2019). The flowering of positive psychology in foreign language teaching and acquisition research. *Frontiers in Psychology*, 10, 2128. <https://doi.org/10.3389/fpsyg.2019.02128>
- Goksu, I. (2021). Bibliometric mapping of mobile learning. *Telematics and Informatics*, 56, 101491. <https://doi.org/10.1016/j.tele.2020.101491>
- González-Lloret, M. (2020). Collaborative tasks for online language teaching. *Foreign Language Annals*, 53(2), 260-269. <https://doi.org/10.1111/flan.12466>
- Gopal, R., Singh, V., & Aggarwal, A. (2021). Impact of online classes on the satisfaction and performance of students during the pandemic period of COVID 19. *Education and Information Technologies*, 26(6), 6923-6947. <https://doi.org/10.1007/s10639-021-10523-1>
- Gunawan, G., Suranti, N. M. Y., & Fathoroni, F. (2020). Variations of models and learning platforms for prospective teachers during the COVID-19 pandemic period. *Indonesian Journal of Teacher Education*, 1(2), 61-70. <https://journal.publication-center.com/index.php/ijte/article/view/95>
- Gustanti, Y., & Ayu, M. (2021). The correlation between cognitive reading strategies and students' English proficiency test score. *Journal of English Language Teaching and Learning*, 2(2), 95-100.
- Kasnezi, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F. ... Kasnezi G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences*, 103, 102274. <https://doi.org/10.1016/j.lindif.2023.102274>
- Kubaczka, K., & Polok, K. (2023). Effectiveness of teaching English by Quizlet to online taught 8th grade students. *Society. Education. Language*, 17, 125-136. [https://doi.org/10.19251/sej/2023.17\(8\)](https://doi.org/10.19251/sej/2023.17(8))
- La Velle, L., Newman, S., Montgomery, C., & Hyatt, D. (2020). Initial teacher education in England and the Covid-19 pandemic: Challenges and opportunities. *Journal of Education for Teaching*, 46(4), 596-608. <https://doi.org/10.1080/02607476.2020.1803051>
- Lapitan J.R, L. D., Tiangco, C. E., Sumalinog, D. A. G., Sabarillo, N. S., & Diaz, J. M. (2021). An effective blended online teaching and learning strategy during the COVID-19 pandemic. *Education for Chemical Engineers*, 35, 116-131. <https://doi.org/10.1016%2Fj.ece.2021.01.012>
- Macaro, E., Curle, S., Pun, J., An, J., & Dearden, J. (2018). A systematic review of English medium instruction in higher education. *Language Teaching*, 51(1), 36-76. <http://dx.doi.org/10.1017/S0261444817000350>



- Murray, D. E., & Christison, M. (2019). *What English language teachers need to know. Volume I: Understanding learning*. New York: Routledge.
- Nartiningrum, N., & Nugroho, A. (2020). Online learning amidst global pandemic: EFL students' challenges, suggestions, and needed materials. *ENGLISH FRANCA: Academic Journal of English Language and Education*, 4(2), 115-140. <http://dx.doi.org/10.29240/ef.v4i2.1494>
- Nelson, R. L., & Bonnac, M. A. (2022). *How adult EFL teachers can effectively utilize Duolingo*. Saint Paul: Hamline University.
- Novita, D. (2021). *Integrating technology and humanity into language teaching book 1: English language teaching*. Yogyakarta: Deepublish.
- Rojabi, A. R. (2020). Exploring EFL students' perception of online learning via Microsoft teams: University level in Indonesia. *English Language Teaching Educational Journal*, 3(2), 163-173. <http://dx.doi.org/10.12928/eltej.v3i2.2349>
- Sari, F. M. (2020). Exploring English learners' engagement and their roles in the online language course. *Journal of English Language Teaching and Linguistics*, 5(3), 349-361. <http://dx.doi.org/10.21462/jeltl.v5i3.446>
- Sari, F. M., & Wahyudin, A. Y. (2019). Undergraduate students' perceptions toward blended learning through Instagram in English for business class. *International Journal of Language Education*, 3(1), 64-73. DOI: 10.26858/ijole.v1i1.7064
- Simanjuntak, M. B., Suseno, M., Setiadi, S., Lustyantje, N., & Barus, I. R. G. R. G. (2022). Integration of curricula (Curriculum 2013 and Cambridge curriculum for junior high school level in three subjects) in pandemic situation. *Ideas: Journal of Education, Social, and Culture*, 8(1), 77-86. <http://dx.doi.org/10.32884/ideas.v8i1.615>
- Tinh, D. T., Thuy, N. T., & Ngoc Huy, D. T. (2021). Doing business research and teaching methodology for undergraduate, postgraduate and doctoral students-case in various markets including Vietnam. *Primary Education Online*, 20(1). <https://dinhtranngochuy.com/218-1612176123.pdf>
- Tursunovich, R. I. (2022). Guidelines for designing effective language teaching materials. *American Journal of Research in Humanities and Social Sciences*, 7, 65-70. <https://americanjournal.org/index.php/ajrhss/article/view/276>
- Zhou, L., Wu, S., Zhou, M., & Li, F. (2020). 'School's out, but class' on', the largest online education in the world today: Taking China's practical exploration during The COVID-19 epidemic prevention and control as an example. *Best Evid Chin Edu*, 4(2), 501-519. <https://dx.doi.org/10.2139/ssrn.3555520>
- Zhylin, M., Mendelo, V., Cherusheva, G., Romanova, I., & Borysenko, K. (2023). Analysis of the role of emotional intelligence in the formation of identity in different European cultures. *Amazonia Investiga*, 12(62), 319-326. <https://doi.org/10.34069/AI/2023.62.02.32>



DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.17>



Cómo citar:

Krokhmal, A., Tymchenko, A., Shayner, H., Lytvynov, A., & Drobin, A. (2024). Use of interactive electronic educational video resources for professional training of specialists. *Revista Eduweb*, 18(3), 223-238. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.17>

Use of interactive electronic educational video resources for professional training of specialists



Uso de recursos de vídeos educativos electrónicos interactivos para la formación profesional de especialistas

Alla Krokhmal

 <https://orcid.org/0000-0002-9490-489X>
 WoS Researcher ID: JWP-8211-2024
krokhmal.alla@gmail.com



PhD., (Pedagogy), Associate Professor, Associate Professor of the Department of Foreign Philology and Translation, O.M. Beketov National University of Urban Economy in Kharkiv, Ukraine.

Alla Tymchenko

 <https://orcid.org/0000-0002-2483-4320>
 WoS Researcher ID: GGA-2167-2022
alla.timoti@gmail.com



Candidate of Pedagogical Sciences, Associate Professor, Associate Professor of the Department of Primary and Preschool Education, V.O. Sukhomlynsky National University of Mykolayiv, Ukraine.

Hanna Shayner

 <https://orcid.org/0000-0002-0086-5579>
 WoS Researcher ID: LDF-6953-2024
hanna.i.shayner@lpnu.ua



Candidate of Pedagogical Sciences, Associate Professor, Assistant Professor of the Department of Foreign Languages for Engineering, Institute of the Humanities and Social Sciences, Lviv Polytechnic National University, Ukraine.

Andrii Lytvynov

 <https://orcid.org/0000-0002-7914-9857>
 WoS Researcher ID: H-1100-2019
andrii.lytvynov@gnpu.edu.ua

PhD., of Pedagogical Sciences, Associate Professor of Primary Education Theory and Methods Chair, Oleksandr Dovzhenko Hlukhiv National Pedagogical University, Ukraine.

Andrii Drobin

 <https://orcid.org/0000-0002-4414-0465>
 WoS Researcher ID: AHC-5632-2022
drobin@bigmir.net

Candidate of Pedagogical Sciences, Senior Lecturer of the Department of Information and Communication Technologies and Safety of the Educational Environment, Municipal Institution "Kirovograd Regional IN-Service Teacher Training Institute named after Vasyl Sukhomlynsky", Ukraine.

Recibido: 20/07/24
Aceptado: 29/08/24



Abstract

The article proves the relevance and main tasks of using interactive electronic educational video resources for the professional training of specialists. The classification and features of interactive electronic educational video resources for the professional training of specialists are presented. The content and features of creating an educational video are disclosed, and their role in the training of specialists is disclosed, the advantages of using video in the educational process during distance education are shown. The significance of using interactive electronic educational video resources for preserving the continuity of education and the possibility of participants' communication in the educational process through platforms, e-mail, messengers (Telegram, Viber, etc.), video conferences, etc., is shown. The importance and advantages of mobile applications for the professional training of specialists with the aim of effective support and learning motivation in the educational process conditions have been proven. Recommendations are offered that can be useful for developing and using interactive electronic educational video resources from various disciplines. The analysis of the results of the conducted pedagogical experiment allows us to state that the use of interactive electronic educational video resources for the professional training of students in real life is indispensable in the modern educational process.

Keywords: interactive electronic educational video resources, professional training of specialists, video courses, video lessons, video classes, video lectures, multimedia technologies.

Resumen

El artículo demuestra la relevancia y las principales tareas del problema del uso de recursos de video educativos electrónicos interactivos para la formación profesional de especialistas. Se presenta la clasificación y características de los recursos de videos educativos electrónicos interactivos para la formación profesional de especialistas. Se divulgan el contenido y características de la creación de videos educativos y se revela su papel para la formación de especialistas, se muestran las ventajas del uso de videos en el proceso educativo durante la educación a distancia. La importancia del uso de recursos de video educativo electrónico interactivo para preservar la continuidad de la educación y la posibilidad de comunicación de los participantes del proceso educativo a través de plataformas, correo electrónico, mensajería (Telegram, Viber, etc.), videoconferencias, etc. se muestra. Se ha comprobado la importancia y ventajas de las aplicaciones móviles para la formación profesional de especialistas con el objetivo de apoyar y motivar eficazmente el aprendizaje en las condiciones del proceso educativo. Se ofrecen recomendaciones que pueden ser útiles para el desarrollo y uso de recursos de videos educativos electrónicos interactivos de diversas disciplinas. El análisis de los resultados del experimento pedagógico realizado nos permite afirmar que el uso de recursos de video educativos electrónicos interactivos para la formación profesional de especialistas ayuda a los estudiantes en la vida real y es necesario en el proceso educativo moderno.

Palabras clave: Recursos de video educativos electrónicos interactivos, formación profesional de especialistas, cursos de video, lecciones de video, clases de video, conferencias de video, tecnologías multimedia.

Introduction

At the current stage of development of society and the educational sector, this is the choice of European norms and standards, joining the Bologna process, European integration. This requires a study of the methodology of continuing professional education as a multifaceted, interdisciplinary problem. Humanity is entering the era of the global world, the new modernity, where the interdependence and interrelationships of peoples, nations, and states are constantly expanding, a market economy, an informational planetary space is being formed intensively, the need for interactive continuous education during the life of every specialist, every member of society, is growing. Education reflects the socio-economic and cultural-



historical state of any country. Therefore, methodologically, there are no norms and ideals of forever set superhistorical standards in the process of professional training.

Under the requirements of the Bologna Convention, continuous human education should provide high-quality, innovative training of specialists for all educational and qualification levels. Modern interactive electronic educational video resources, which are necessary for the professional training of specialists, contribute to the improvement of the quality of innovative professional training.

The social order of society requires that the educational sector form people who know how to master and can creatively apply the basics of modern knowledge in practice, think, and have a high level of morality (Shetelya et al., 2023).

The use of interactive electronic educational video resources for the professional training of specialists, which can be used in cloud-oriented or traditional educational environments, is becoming increasingly important for the educational sector because, with the development of the latest technologies, it is becoming increasingly necessary to support students' interest in models of traditional learning or distance learning, mobile learning. The use of interactive electronic educational video resources for professional training of specialists (video courses, video lectures, individual video lessons, etc.) is the focus of attention of large corporations and companies and individual specialists and practitioners.

The use of interactive electronic educational environments and mass open online courses for professional training of specialists is relevant today: edX (edx.org) from Harvard University and the Massachusetts Institute of Technology, Coursera (coursera.org) from Stanford University, Lynda (lynda.com) from the company LinkedIn, Prometheus (Prometheus.org.ua) from several Ukrainian universities, which successfully combine video formats and text-graphic presentations of educational material.

A significant educational video resource is offered by YouTube video hosting. The rapid development of open electronic educational environments and new-generation educational resources has shown that non-textual and graphic tools (presentations with animated effects, structured hypertext electronic textbooks and manuals, interactive textbooks, testing systems, etc.) are a popular and effective component of the modern interactive educational environment. Video resources, the variety of which requires their creation and implementation, exchange of experience in the administration of works, development of the conceptual and categorical apparatus, as well as generalization in various forms of learning of the experience of using video resources (Hlynsky et al., 2017).

Given this, the problem of using interactive electronic educational video resources for the professional training of specialists in the study of various professional disciplines in the educational process is relevant and will be revealed in this article.

Literature Review

The problem of using interactive electronic educational video resources for the professional training of specialists is relevant and is being studied by scientists from different countries.

Scientists M. Baryshok, & D. Termenzhy (2021b), according to the ADDIE model of the theory of pedagogical design, described the author's experience in designing video lessons in mathematics, proposed the stages of creating educational materials: development, design, analysis, implementation, evaluation. The tasks that the developer must solve at each of these stages have been developed. The main formats for recording video lessons are proposed based on the analysis of existing developments. It has been established that distance learning has become an integral part of the educational process in the modern world because it allows students to study anywhere and at any time, which increases motivation to study.

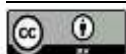


N. Anishchenko & A. Yevchuk (2020) are devoted to the problem of organization in education of methodical activity through the introduction of innovative educational technologies. The scientists substantiated various approaches to the definition of methodical work, showed the importance of using innovative forms of education in the educational field, and clarified their role in methodical work. The need for coordination in the education system, the development of educational institutions, and innovations in education have been proven; the existing problems of methodical work are analyzed, and ways of their solution by the teacher are proposed. Innovative approaches to the organization of methodical activity with pedagogical staff were analyzed and highlighted; the importance of the professional formation of a specialist was emphasized, and the prospects of transformation into service centers of methodical offices were considered to provide educational services to pedagogical workers; the influence of the teacher on his methodical activity is revealed. Under the conditions of modernization of education, promising trends in the development of methodical professional activity are shown. Using methodical work, in the conditions of the educational institution, the problem of improving the professional competence of teachers has been actualized.

The need to spread mobile learning in modern education, the importance of the use of information and communication technologies by students to increase the motivation to use mobile applications and improve their learning results in the process of teaching the disciplines of the humanities and natural sciences by A. Sustrietov, V. Ilnatiev, & I. Briukhovetska (2023) have been proven. It is noted that mobile devices allow students to improve the way they acquire skills and knowledge and thus establish the educational role of engaging mobile applications for additional information and synchronizing interaction between students of higher education, a direct impact on the way young people access information, the penetration of mobile applications and mobile devices in education. Mobile applications are described as tools used in distance learning to support learning and increase student motivation. The advantages that make the use of interactive electronic educational video resources for the professional training of specialists attractive are highlighted, and recommendations for the use of mobile applications are drawn up when teaching natural sciences and humanitarian disciplines.

The work of O. Gordiyenko & A. Shevkun (2021) in the conditions caused by the coronavirus disease pandemic is devoted to the problems of implementing mixed and remote forms of the educational process, analysis of teaching aids in higher education institutions using interactive technologies, and information and communication technologies. The research of scientists is focused on the study of the tools of the MS Teams platform and its main characteristics regarding the introduction of new interactive methods of teaching professional disciplines. A modern complex of methods, techniques, and means of teaching professional disciplines to students of higher education institutions has been developed. The results of the study contribute to the effective achievement of educational goals, make it possible to present educational material without significant quality loss using distance learning, maintain the interest of students, and provide an incentive for creativity in the educational process, which will be useful in the implementation of independent work of students.

Issues of theoretical development, substantiation, and introduction into the educational process of electronic educational video resources within the discipline "Informatics" for students of various specialties are dealt with by Y. Hlynsky, D. Fedasiuk, & V. Riazhska (2017) in the example of the analysis of the results of using a collection of video lessons and the development of projects in event-oriented programming. The scientists proposed the development of the existing conceptual and categorical apparatus, which relates to the development of electronic educational video resources within the discipline "Informatics". It has been proven that to increase the level of fundamentalization of learning in favor of independent work outside the classroom by students through the redistribution of study time, video lessons make it possible to automate the education process and ensure the release of classroom time to cover theoretical issues of the educational process. Practical recommendations for the creation of effective electronic educational video resources within the discipline "Informatics", which can be useful for students of various forms of education, are provided.



V. Bykov, O. Liashenko, S. Lytvynova, V. Luhovyi, Yu. Maliovanyi, O. Pinchuk, & O. Topuzov (2022) obtained a comprehensive analysis of the state of digitization of education and developed scientific and methodological support for higher education, identified current problems and identified the causes of their occurrence at all levels of digitalization of education, outlined the tasks and from a scientific point of view, ways of implementing digital transformation in the conditions of continuous innovative development of society, European integration of the educational sector are proposed in educational institutions. Effective methods and forms that promote interdisciplinary integration with digital technologies are given by Y. Karpenko & I. Golovko (2023): video classes, virtual laboratories, joint lectures, problem-based lectures, game technologies, and the use of the Moodle educational platform for distance learning.

So, as a result of the study of ways to use interactive electronic educational video resources for professional training of specialists, we note that the scientists obtained a comprehensive analysis of the state of digitization of education and developed scientific and methodological support for higher education; identified current problems and identified the causes of their occurrence at all levels of digitalization of education; identified effective methods and forms that promote interdisciplinary integration with the use of digital technologies; deal with the issues of theoretical development, substantiation, introduction into the educational process of electronic educational video resources for students of various specialties; substantiated various approaches to the definition of methodical work and showed the importance of using innovative forms of education in the educational field; described the author's experience in designing video lessons in mathematics, proposed the stages of creating educational materials; proposed the main formats for recording video classes; proved the need to spread mobile learning in modern education, showed the importance of using information and communication technologies by students in order to increase the motivation to use mobile applications and improve their learning results in the process of teaching professional disciplines; focused research on the study of the tools of the MS Teams platform and its main characteristics, regarding the introduction of new interactive methods of teaching professional disciplines, but did not specify the ways of using interactive electronic educational video resources for professional training of specialists.

Purpose of the research – to prove the necessity of using interactive electronic educational video resources for professional training of specialists when studying professional disciplines in the educational process.

Methodology

To realize the outlined goal, research methods were used: theoretical – analysis of psychological, philosophical, methodological, pedagogical sources, study of foreign and domestic pedagogical experience, methodological materials of higher education institutions, special literature on the problem of using interactive electronic educational video resources for professional training of specialists, application of multimedia systems in education; methods of comparative, retrospective, systematic analysis in order to determine the conceptual and categorical apparatus of research, to compare different views on the researched problem, to consider theoretical questions of research; system analysis during the substantiation of interactive electronic educational video resources for professional training of specialists; empirical – prognostic methods (generalization of independent characteristics, expert evaluations), observational methods (observation, self-observation, self-evaluation), diagnostic methods (surveys, conversations, questionnaires) to identify the level of readiness of future specialists to use interactive electronic educational video resources for their professional training, experimental (conducting an experiment) to determine and check the level of readiness of future specialists to use interactive electronic educational video resources for their professional training; methods of mathematical statistics – on the basis of establishing quantitative indicators of the assessment of the phenomenon under study for the analysis of the obtained results and confirmation of their probability.

During the experimental work, a survey was conducted in which 124 respondents took part: students and teachers aged 20-63 (teachers with an average teaching experience of 18 years). We conducted an online survey using the capabilities of the GoogleForms service and questionnaires in the audience.



The analysis of the results of the conducted pedagogical experiment allows us to assert that the use of interactive electronic educational video resources for the professional training of specialists helps students in real life and is necessary in the modern educational process.

When further improving the system of using interactive electronic educational video resources for the professional training of specialists, we took into account the results of the questionnaire.

Results and Discussion

Relevance and main tasks of the problem of using interactive electronic educational video resources for professional training of specialists.

The challenges of modern society have proven the need to change the education system, which needs changes because outdated educational materials, teachers' unpreparedness to work in a digital environment, outdated teaching tools and methods of teaching students have led to many difficulties in organizing the learning process (Sulym et al., 2023).

Along with this, today's youth belong to Generation Z, which was formed and grew up in a digital environment. Students of the new information society are characterized by multitasking, that is, the ability to do several things at the same time. They perceive information differently, actively use 3D reality and virtual reality (VR), and prefer the multimedia format. Their language consists of audio podcasts, online broadcasts and IGTV, blog posts, text messages in messengers, discussions in various social communities, videos on YouTube channels, etc.

Therefore, the main task of a modern teacher in higher education is to "communicate" with such an innovative student in one language, involving him in a rich, more active, motivating educational process. It is in this case that video courses, video lessons, video lectures, and multimedia technologies come to the teacher's aid. Until recently, video courses, video lessons, video classes, and video lectures were used in the educational process only as an auxiliary tool, for example, in cases when, under normal conditions, the educational material is difficult for students to perceive (Baryshok & Termenzhy, 2021a). In modern realities, video courses, video lessons, video lectures have become one of the means of asynchronous learning mode, which allows you to master the material, focus on your own understanding, and learn at your own pace and according to your own schedule.

The need to create an innovative interactive pedagogical system of the educational process appears among the main tasks of the educational industry for the purpose of qualitative use of interactive electronic educational video resources for the professional training of specialists and the purpose of personality development. A modern person must be creative, think productively, satisfy his own needs in self-discovery, be self-realized, creatively improve himself, and define himself personally and professionally. In solving this task, success is determined by professional skill, the general professional culture of the teacher, the acquired knowledge of the student, and his creative potential. Given this, the problem of using interactive electronic educational video resources for the professional training of specialists becomes relevant (Tretko et al., 2023).

Interactive electronic educational video resources for professional training of specialists are pedagogical innovations that are reflected in the content of education, methods, and forms of educational activity, arising as a result of creative searches for non-standard, original options for solving various problems in the regime of educational institutions, in the structure, management, and education control.

The use of interactive electronic educational video resources for the professional training of specialists contributes to increasing the level of staffing of teachers, their stimulation and innovative management of educational institutions, improving the professional skills of teachers, introducing modern technologies into



educational activities, innovative methodological activities through the use of effective, innovative forms, tools, methods, techniques.

In the context of the use of interactive electronic educational video resources in the training of specialists updating the content of education, priority is given to the following innovative forms of educational activity organization:

- Choose your own development trajectory;
- Taking into account educational requests and needs of future specialists;
- Encouraged everyone to acquire professional competencies
- To promote the student's ability to adapt to conditions that are constantly changing;
- To determine the motives of the professional development of an individual, the level of professionalism, options, and forms of a person's professional growth.

Classification of interactive electronic educational video resources for specialist training.

The results of creative searches in the professional training of specialists through the use of interactive electronic educational video resources can become educational technologies, new pedagogical innovations that should shape a person's worldview, contribute to the development of personality, increase culture, which is necessary in society for the success of every person (Anishchenko & Yevchuk, 2020).

According to the nature of the use of interactive electronic educational video resources, it is possible to divide them by purpose:

- Electronic video resources for managerial purposes;
- Electronic educational video resources;
- Electronic video resources for scientific research (Tsarova et al., 2023).

In our opinion, the following important types of interactive electronic educational video resources should be considered for the professional training of specialists:

- 1) *Electronic didactic demonstration materials* – electronic data intended for the demonstration of objects, processes, visual and audio presentation of phenomena by providing the opportunity to observe them, which are studied to deepen their understanding;
- 2) *Electronic educational and methodical materials* – method recommendations, materials on teaching methods, instructions for coursework, laboratory, practical, etc.).

Interactive electronic educational video resources can also be classified according to the following criteria:

- According to the form of work in the lesson: individual, frontal, group
- According to the completeness of coverage of educational materials: not self-sufficient; self-sufficient (complete);
- By aggregation: elements; collections (homogeneous, homogeneous – homogeneous, heterogeneous –Heterogeneous).

Interactive electronic educational video resources for the professional training of specialists are classified by functionality (an inseparable connection is associated with the types of classes, which determines the duration of its playback):

- **Video course** – a set of electronic educational resources is a means of educational activity, which includes the presentation of data, with the principle and the predominant use of video data in various formats, containing a collection of video lectures and video lessons, which are a component of an



electronic educational and methodological complex, reflect informational materials of a certain discipline or other open or closed educational electronic environment;

- **Video element** – short, 1–4 minutes long, video resource, which is an intro tool or a mini-video lesson, an advertising and familiarization tool, a fragment of some video resource, course annotation, etc.);
- **Video lecture** – a video resource designed to display the topic of an educational discipline with a duration of 20-80 minutes;
- **Video lesson** – the video resource is intended for the display of individual informational materials lasting 4-20 minutes within the framework of the topic of the educational discipline.

The average value of the specified time intervals should be considered the optimal value of the duration characteristics of the corresponding types of video resources.

According to the method of creation, interactive electronic educational video resources will be divided into three types during professional training of specialists:

- **Computer** – created using specialized software tools by capturing video from the monitor screen;
- **Real-life** – digitized and created by video recording (teacher-experiment, teacher-chalk-board, experiment-experiment-phenomenon-event, teacher-presentation-projector, etc.);
- **Combined** – created by combining previous approaches.

For successful assimilation of the material, interactive electronic educational video resources for professional training of specialists are divided into:

- Interactive electronic educational video resources for one-time viewing;
- Interactive electronic educational video resources for repeated viewing (if the subject of study is already familiar with the electronic educational video resource in frontal mode at the lecture, later views the interactive electronic educational video resource at home in mobile mode or turns to the interactive electronic educational video resources during laboratory classes for the third time, etc.) (Leleka et al., 2022).

Features of interactive electronic educational video resources.

The peculiarity of interactive electronic educational video resources is that in 7–12 minutes (within a limited period), they reveal topics that the lecturer, due to the insufficient amount of classroom time allocated to the course, cannot reveal by traditional means.

Interactive electronic educational video resources were used by us in various forms of training during the professional training of specialists. Initially, they were used in a multimedia lecture hall facing the front during a traditional lecture. Since the demonstration can be performed from a computer that is not connected to the network, the remoteness of the video broadcast from YouTube is not essential here. Due to the transfer of the presentation of pragmatic topics of the traditional lecture to the video mode and the change in the form of the presentation of the material, a pedagogical effect was achieved (Drozich et al., 2023).

The concentration coefficient will approximately be $k = 3$ when one such 10-minute film replaces a 30-minute oral message of the lecturer in terms of the volume of presentation of the material. Educational material was provided to students of distance education through the means of an open educational environment with the possibility of viewing video materials on YouTube. The developed video lesson can be considered, in this case, as an element of a distance course. However, the mobile form of education is associated with a significant number of video viewings, which we also practiced with students of the face-to-face form of education.



It became obvious due to the novelty of the material and the specificity that it is not enough to learn to create projects by watching a video once by one subject of training. The video lesson should be viewed 2-3 times to complete independent work on the proposed topic:

- At lectures – collectively;
- In Wi-Fi-equipped transport;
- Individually in the laboratory or at home, etc., using modern mobile devices: tablets, smartphones, and laptops (Hlynsky et al., 2017).

Conducted video lectures and created video resources by redistributing study time in favor of students' independent extracurricular work, making it possible to automate the educational process. For many higher education students, this meant taking classes in real-time (Google Meet, Zoom, etc.) via video chat platforms. A video came to the aid of both the student and the teacher.

What can be written in a 1,500-word article will attract more viewers and will allow you to explain the entire material in a one-minute video (Buchynska, 2015). Not all videos are equally useful and interesting for the listener. In the study "How video production affects student engagement: an empirical study of MOOC videos," Philip J. Guo, Juho Kim, & Rob Rubin (2014) measured engagement by how long college students watched the video and whether they attempted to answer the questions they received as a result video viewing, as a result of knowledge assessment, used data from 6.9 million video sessions on online courses concluded that video is important for online learning, but noted that some types of video work better and others less well. The researchers emphasized that:

- Short videos are more attractive than long ones (up to 15 minutes);
- A video in which a "talking head" is interspersed with slides is more attractive than a video containing only slides;
- More attractive for students are videos that can be used in the educational process where teachers speak enthusiastically and quickly enough.

The content and features of creating educational videos and their role for training specialists.

During innovative education, the following will be most appropriate for use:

- 1) **Screencasts, which can be accompanied by voice comments** – a digital recording of information that is constantly displayed on the computer screen. Computer screencasts are one of the main ones for working with various types of software when creating educational videos;
- 2) **Video with presenters** – is an electronic analog of a lecture, which students can watch at any time. In such videos, illustrative material is presented (presentation slides), and there is a speaker;
- 3) **How-to videos** – YouTube often has typical tutorial videos that are effective for product maintenance or assembly demonstration and quick to create;
- 4) **Explainer videos** – videos can be a hybrid of text annotations, animations, and live video, usually between 1 and 2 minutes long. There are different styles of video explainers designed to provide a direct, clear, well-written message that simplifies complex ideas into basic concepts, from videos with high visual saturation to simple animated images;
- 5) **Interactive videos** use short-term and professional video clips, including such elements as tests, images, text, etc., suitable for the formation of professional work skills, for monitoring one's learning;
- 6) **Demonstrations** – videos that contain a demonstration of laboratory work, experiments, software, and equipment operation, which can be created based on objective video shooting from photos of process stages (the process of creating a drawing, drawing, repair, assembly-disassembly, etc.).

You can also highlight the following educational videos: video scribing, studio video lectures, professional educational videos, 3D visualization, etc. These types of videos require appropriate knowledge and equipment, as they are more complex to create.



To create a high-quality educational video for professional iterative training of specialists, you need to perform the following steps:

- 1) To make the video as useful as possible, it is necessary to determine the target audience;
- 2) To conduct a more rich and informative lecture, prepare a scenario by thinking over theses and tips, structuring the material;
- 3) Choose a camera and microphone with greater demands on sound and picture quality;
- 4) Choose a shooting location, think through the presenter's image, and set the lighting, remembering that the popularity of the video largely depends on the picture;
- 5) Before recording the video, you should choose the speaking pace and the optimal volume of the text and read the text aloud, the entire lecture can be divided in its entirety into short takes;
- 6) use the program for editing and creating educational videos.

To create a simple lesson video without complex special effects, you can use software that does not require special skills and knowledge. To keep the viewer's attention, creating an attractive video for students requires adding interactive quizzes or tests to the video lesson, which will allow the teacher to assess students' understanding of key concepts in real time (Shunkov et al., 2023).

The use of subtitles is another step that will make educational videos more useful, popular, and accessible to viewers who do not have or cannot listen to audio. Movement and graphics play a significant role in keeping the audience's attention. The use of motion graphics replaces text (Marrero-Sánchez & Vergara-Romero, 2023).

Let's name the advantages of using video in the educational process during distance education:

- The effect of presence (the student has the opportunity not only to read the text of the lecture but also to see his teacher);
- Easy integration with most learning management systems;
- Multiplicity and increased involvement of students in the educational process;
- Allows for humanizing the content of education;
- Students feel truly involved in the learning environment (Yatsenko & Yatsenko, 2022).

The use of interactive electronic educational video resources to preserve the continuity of education and the possibility of communication of the participants of the educational process through platforms, e-mail, messengers (Telegram, Viber, etc.), video conferences, forums, chats, etc. – through the means built into the education management system.

The choice by higher education institutions of the popular cloud service – the MS Teams platform from Microsoft Office – as a base for teaching in the quarantine conditions caused by the pandemic has shown itself as a comfortable and simple environment for students and teachers to use interactive electronic educational video resources for the professional training of specialists and the implementation and organization of educational tasks (Balalaieva et al., 2023).

The main components of the platform are video classes, teams, tasks, and forms.

Let's take a closer look at them and their capabilities.

Video lessons (Calling) in the MS Teams platform provide an opportunity to organize audio and video calls with each participant individually and with a group. The call can be scheduled as an instant or as an event in the calendar (Meeting), that is, participants are notified of an incoming call by the program, and the organizer switches to call mode immediately. The teacher can additionally use an interactive whiteboard for a visual demonstration of practical and theoretical material, represented by several applications (OneNote, Whiteboard, Freehand by InVision) (Knysh et al., 2023).



Teams (Teams) in the MS Teams platform allow users registered in the system to join groups to work on common tasks, projects, and files. Teams can be used by majors as groups of students in distance learning conditions. The following types of teams are provided for this purpose: staff, professional educational community (PEC), class, and others. As the owner of the team, the teacher can add co-owners and students, edit information about it, assign and correct tasks, manage events and video conferences, pin the team, and create additional thematic channels (hidden or public) in the "top".

Creating assignments (Assignments) in MS Teams provides support for discipline and motivation of students in the conditions of distance and mixed learning because the teacher sets deadlines, work evaluation criteria, plans tasks, assigns work to the team or individual members of it, and comments on each submitted work individually.

Forms are a component of the MS Teams platform designed for the creation and use of questionnaires, tests of various types, and surveys for quick information gathering. Forms have a fairly wide range of applications. The teacher creates and applies tests for ongoing verification of independent work, acquired abilities, knowledge, skills, and final and thematic control. Students can immediately receive the result, and the teacher can immediately receive statistical data on the success of the task because the evaluation process is almost completely automatic (Marusynets et al., 2022).

With the integration of the above-described interactive electronic educational interactive technologies of the MS Teams platform during the professional training of specialists, effective communication between the teacher and students is achieved at the highest possible level, and also the students of education acquire special and general competencies provided by the work program, which is necessary during the independent study of topics by students and during the lesson with the teacher (Gordiyenko & Shevkun, 2021).

Importance and advantages of mobile applications for professional training of specialists to effectively support and motivate learning in the conditions of the educational process.

The modern world requires more effective learning models that allow students to play a more active role in the learning process. Promoting innovation and creativity through the use of new ICT tools and training specialists in distance learning technologies is one of the priority areas of the strategic framework for education and training. Mobile applications for professional training of specialists are an effective means of supporting and motivating learning in the conditions of the educational process because they have advantages over traditional methods of learning (Lavrynenko, 2020).

Let's highlight the advantages of mobile applications for the professional training of specialists with the aim of effective support and motivation of learning in the conditions of the educational process

:

- Mobile applications can be used anytime and anywhere;
- Can be adjusted to the interests of the applicants, to individual needs, which helps to maintain interest in learning and their motivation for education;
- Mobile applications to feel confident and motivated for further achievements, allow students to track their progress in education;
- Game applications can be an effective way to make learning exciting and more interesting when used in the study of various disciplines;
- For learning, mobile applications with feedback can provide real-time feedback, help learners understand their strengths and weaknesses, enabling students to quickly improve their professional and digital skills;
- Mobile applications motivate to work together, develop communication and teamwork skills, and allow learners to work together on joint projects, even though mobile devices are part of the daily life of learners (Shuliak et al., 2022).



We will single out the most effective mobile applications that can be used to motivate education, which are useful in teaching professional disciplines, and support learning in distance education conditions:

- PhET Interactive Simulations: to help the understanding of chemical processes, the application offers interactive simulations;
- Physics Sandbox: the application allows users to experiment with various physical phenomena;
- Khan Academy Physics: offers interactive tasks, video lessons, and other resources for studying physics;
- Simulations Plus: the application offers interactive simulations that help to understand physical processes;
- iNaturalist: using the phone's camera, the application allows users to identify animals, plants, and other objects of living nature;
- Khan Academy Biology: the application offers interactive tasks, video classes, and other resources for studying biology;
- Khan Academy Chemistry: the application offers interactive tasks, video classes, and other resources for studying chemistry;
- Chemistry 3D: the application allows users to study chemical structures and reactions in three-dimensional space;
- Khan Academy History: the application offers interactive tasks, video classes, and other resources for studying history;
- The History Channel App: The app offers history news, articles, and other history resources.
- Crash Course World History: offers video lessons about history in an accessible form.

These applications are used for various educational purposes – both for joint work and for individual study with other students: for completing tasks, consolidating knowledge, learning new material, preparing for tests or modular tests, etc. (Puhach et al., 2021). Since the power and capabilities of interactive electronic educational video resources are constantly growing, they occupy an important place in both face-to-face and distance education and can be more widely used as educational tools (Sustrietov et al., 2023).

Recommendations that can be useful for the development and use of interactive electronic educational video resources from various disciplines.

1. The development of interactive electronic educational video resources should begin with the creation of a short video lesson or video lesson using the oCam or Camtasia Studio programs. Computer video lessons and video classes, which are devoted to the technological aspects of technical disciplines, are the most useful and, in just 15 minutes, or even less – a limited period – reveal questions that the lecturer, by traditional means, cannot reveal due to insufficient the amount of classroom time.
2. One of the best programs for creating videos and screenshots is Camtasia Studio – a program that has an accessible and understandable interface. It needs 2 GB of RAM for comfortable operation. The cost of the program is 299 USD. The program makes it possible to create video materials of professional quality. You can save the recorded video in the following formats: SWF, AVI, FLV, WMV, MOV, and GIF. You can immediately export videos to YouTube and create videos for iPad and iPhone. Camtasia Studio uses its high-quality codec (TechSmith Screen Capture Codec (TSCC)) FOR video encoding. Camtasia Studio has a powerful built-in video editor with features that are not available in other specialized programs. For the development of high-quality interactive electronic educational video resources, the program is best suited to Camtasia Studio Developing interactive electronic educational video resources is a creative process that cannot be formalized.
3. We offer the development of stages of interactive electronic educational video resources (Hlynsky et al., 2017):



- Development of the script of the video resource (development of the plot and structuring and selection of materials: statement of the task, formulation of the goal and topic, the main presentation, recommended sources, used sources, conclusions);
 - Preparation of the speech text;
 - Preparation for video recording (preparation of slides, photos, scenery, scenery, working out plots, fragments of other videos, screensavers);
 - Performance of trial recording of the video resource or its parts;
 - If necessary, re-recording the video, editing the script (plot, text, other elements);
 - Video editing, technical video editing (removing pauses, adding elements, working with sound, creating transitions, scaling images, footnotes, etc.);
 - Critical analysis of sound accompaniment and replacement of the announcer, replacement of the soundtrack if necessary;
 - Approbation of videos with professional training of specialists.
4. Focusing efforts on the scientific and methodical systematic support of digitalization of education as a whole system of digital transformation in terms of technical-technological, regulatory, psychosocial, didactic-procedural, personnel, managerial, and other aspects.
 5. Intensification of the development of the educational segment of the world open scientific and educational information and digital space, its saturation with national electronic educational resources, computer-oriented means (digital educational platforms, digital educational content with augmented and virtual reality, mobile applications, electronic textbooks, management systems training, simulation, 3D models, etc.) to fully meet the needs of participants in the educational process in its implementation and effective design.
 6. Ensuring targeted systematic development of digital competence of participants in the educational process: researchers, teachers of educational institutions, as well as students.
 7. Introduction of a system of incentives for subjects of educational activity for effective use and creation by them of information systems, technologies, and digital means.
 8. Implementation of certification of pedagogical workers, scientific-pedagogical, and scientific workers regarding their information and digital competence.
 9. Improving the quality of professional training of specialists for effective professional activity in institutions of higher education and the digital educational environment.
 10. Modernization of the content and methods of training specialists through the use of interactive electronic educational video resources, taking into account digital educational trends.
 11. Expanding the construction of open pedagogical systems, applied and fundamental research of the problem of digital pedagogy, psychological aspects of interaction in the virtual learning environment of the subjects of the educational process.
 12. Implementation of e-learning in formal, informal, non-formal education, etc.
 13. Provision of psychological support and scientific and methodological support for the development of digital literacy for people of all age groups.
 14. Implementation of measures to increase media literacy of the population, awareness of cyber security, information security, health protection of ICT users, countering threats of unauthorized use of personal data, protection of confidential information, etc. (Bykov et al., 2022).

The experiment

During the experimental work, a survey was conducted in which 124 respondents took part: students and teachers aged 20-63 (teachers with an average teaching experience of 18 years). We conducted an online survey using the capabilities of the GoogleForms service and questionnaires in the audience.

The purpose of the study is to prove the necessity and importance of using interactive electronic educational video resources for the professional training of specialists in the study of professional disciplines in the educational process.



As a result of the conducted survey, it was established:

- 85% of respondents recommend using interactive electronic educational video resources for professional training of specialists;
- 80% of respondents believe that interactive electronic educational video resources for professional training of specialists increase motivation to study;
- 55% of respondents themselves use or used to use interactive electronic educational video resources during the educational process and professional activity;
- 94% of respondents (the vast majority of students) were interested in video lessons, and they wanted to use interactive electronic educational video resources constantly in the educational process.

Students attributed the following to the positive aspects of video lessons:

- 85% – novelty and modernity of providing new educational information;
- 74% – accessibility in obtaining the necessary information;
- 71% – attractive interface, convenience, and simple navigation system;
- 57% – motivating factor;
- 48% – visibility;
- 47% – an interesting explanation of difficult professional points.

However, 40% of respondents emphasized that it is worth breaking up long video lessons into several small videos (5-6 minutes each), that is, they suggested reducing their duration.

Respondents who took part in the survey noted (almost a third of students) that reference tasks should be more complex.

The analysis of the results of the conducted pedagogical experiment allows us to assert that the use of interactive electronic educational video resources for the professional training of specialists helps students in real life and is necessary for the modern educational process, namely:

- 94% of the surveyed respondents indicated an interest in using interactive electronic educational video resources during professional practice at the workplace;
- only 6% of respondents noted that important professional issues could be presented in traditional lectures;
- 88% of students of higher education noted that the use of interactive electronic educational video resources increased their interest in the future profession and significantly expanded their horizons;
- 94% of students would like teachers to use interactive electronic educational video resources for professional training of specialists in the educational process;
- 76% of students consider the most relevant use of interactive electronic educational video resources during distance learning.

When further improving the system of using interactive electronic educational video resources for the professional training of specialists, we took into account the results of the questionnaire.

Conclusions

We have proven the relevance and main tasks of the problem of using interactive electronic educational video resources for the professional training of specialists. The classification and features of interactive electronic educational video resources for the professional training of specialists are presented. The content and features of creating educational videos are disclosed, and their role in the training of specialists is revealed, the advantages of using videos in the educational process during distance education are shown.



The significance of the use of interactive electronic educational video resources to preserve the continuity of education and the possibility of communication of the participants of the educational process through platforms, e-mail, messengers (Telegram, Viber, etc.), video conferences, etc., is shown. The importance and advantages of mobile applications for the professional training of specialists with the aim of effective support and motivation of learning in the conditions of the educational process have been proven. Recommendations are offered that can be useful for the development and use of interactive electronic educational video resources from various disciplines.

During the experimental work, a survey was conducted in which 124 respondents took part: students and teachers aged 20-63 (teachers with an average teaching experience of 18 years). We conducted an online survey using the capabilities of the GoogleForms service and questionnaires in the audience.

The analysis of the results of the conducted pedagogical experiment allows us to assert that the use of interactive electronic educational video resources for the professional training of specialists helps students in real life and is necessary in the modern educational process.

When further improving the system of using interactive electronic educational video resources for the professional training of specialists, we took into account the results of the questionnaire.

Further research is needed to modernize the content and methods of training specialists through the use of interactive electronic educational video resources, taking into account digital educational trends.

Bibliographic references

- Anishchenko, N., & Yevchuk, A. (2020). The innovation forms of creating a model of modern methodical work at school. In *Pedagogical Innovations: Ideas, Realities, Perspectives. Series "Pedagogical Sciences"* (pp. 7-12). <https://doi.org/10.32405/2413-4139-2020-1-7-12>
- Balalaieva, O., Mochan, T., Hryhorenko, T., Andreikova, I., Paltseva, V., & Podkovyrov, N. (2023). Innovative pedagogical technologies – the most important resource in modernizing the training of a modern specialist. *Amazonia Investiga*, 12(63), 67-76. <https://doi.org/10.34069/AI/2023.63.03.6>
- Baryshok, M. V., & Termenzhy, D. Ye. (2021a). Development and implementation of video lessons in mathematics with elements of STEAM education. In *Abstracts of the 14th International Scientific and Practical Conference "Innovation in Science and Technology"* (pp. 10–14). Primedia E-launch LLC. https://el-conf.com.ua/wp-content/uploads/2021/02/США_сайт.pdf
- Baryshok, M., & Termenzhy, D. (2021b). Stages of designing a system of mathematics videoleasons: the ADDIE model. *Physical and Mathematical Education*, 30(4), 20-28. <https://doi.org/10.31110/2413-1571-2021-030-4-003>
- Buchynska, D. L. (2015). Using video in educational process is an urgent need. *Electronic Scientific Professional Journal "Open Educational E-Environment of Modern University"*, (1), 101-107. <https://doi.org/10.28925/2414-0325.2015.1.101ue7>
- Bykov, V. Yu., Liashenko, O. I., Lytvynova, S. H., Luhovyi, V. I., Maliovanyi, Y. I., Pinchuk, O. P., & Topuzov, O. M. (2022). *Scientific and methodological support of digitalization of education in Ukraine: State, problems, prospects*. (V. G. Kremen, Ed.). Kyiv: Institute of Digitalization of Education of the National Academy of Pedagogical Sciences of Ukraine. <https://lib.iitta.gov.ua/id/eprint/733151/1/Аналітична%20доповідь%202022%20%282%29.pdf>
- Drozich, I., Drobin, A., Skrypka, I., Mamchych, O., Mykhailenko, O., & Kurach, M. (2023). The role of education in the innovative society. *Amazonia Investiga*, 12(64), 45-56. <https://doi.org/10.34069/AI/2023.64.04.4>
- Gordiyenko, O., & Shevkun, A. (2021). Integration of interactive technologies when teaching a foreign language in medical universities. *Current Issues of Humanitarian Sciences*, 43(1), 226-234. <https://doi.org/10.24919/2308-4863/43-1-33>
- Guo, P. J., Kim, J., & Rubin, R. (2014). How video production affects student engagement: An empirical study of MOOC videos. In *Proceedings of the first ACM conference on Learning @ Scale conference*



- (L@S '14) (pp. 41–50). Association for Computing Machinery. <https://doi.org/10.1145/2556325.2566239>
- Hlynsky, Y. M., Fedasiuk, D. V., & Riazhska, V. A. (2017). Development and use of electronic video resources for educational purposes. *Information Technologies and Learning Tools*, 58(2), 67-78. <https://doi.org/10.33407/itlt.v58i2.1580>
- Karpenko, Y., & Golovko, I. (2023). Intersubject integration of chemical disciplines with the help of digital technologies. *Scientific Bulletin of the IZmail State University of Humanities*, (62), 97-103. <http://visnyk.idgu.edu.ua/index.php/nv/article/view/721>
- Knysh, I., Budanova, O., Vakulenko, S., Syrotina, O., & Popychenko, S. (2023). Innovative educational technologies as a way of higher education enhancement. *Amazonia Investiga*, 12(68), 21-32. <https://doi.org/10.34069/AI/2023.68.08.2>
- Lavrynenko, L. (2020). Education in today's reality - distance learning. *Proceedings of the MCND Conferences*, 25-28. <https://doi.org/10.36074/10.04.2020.v1.01>
- Leleka, V., Zabiika, I., Tsviakh, O., Grubi, T., & Vytrykhovska, O. (2022). Innovative approaches to teaching students in the modern educational information environment in the USA and Great Britain. *Amazonia Investiga*, 11(60), 156-166. <https://doi.org/10.34069/AI/2022.60.12.17>
- Marrero-Sánchez, O., & Vergara-Romero, A. (2023). Digital competence of the university student. A systematic and bibliographic update. *Amazonia Investiga*, 12(67), 9-18. <https://doi.org/10.34069/AI/2023.67.07.1>
- Marusynets, M., Vovkochyn, L., Yakymenko, S., Tkachuk, N., & Tymchenko, A. (2022). Innovative educational technologies in the system of specialist's professional training. *Amazonia Investiga*, 11(60), 177-186. <https://doi.org/10.34069/AI/2022.60.12.19>
- Puhach, S., Avramenko, K., Michalchenko, N., Chychuk, A., Kuchai, O., & Demchenko, I. (2021). Formation of Specialists' Legal Competence in the System of Life Long Education. *Romanian Magazine for Multidimensional Education*, 13(4), 91-112. <https://doi.org/10.18662/rrem/13.4/472>
- Shetelya, N., Oseredchuk, O., Cherkasov, V., Kravchuk, O., Yarova, L., & Kuchai, O. (2023). Competency approach in preparing professionals in an innovative educational environment in higher education. *Revista Conrado*, 19(S3), 298-307. <https://conrado.ucf.edu.cu/index.php/conrado/article/view/3512>
- Shuliak, A., Hedzyk, A., Tverezovska, N., Fenchak, L., Lalak, N., Ratsul, A., & Kuchai, O. (2022). Organization of Educational Space Using Cloud Computing in the Professional Training of Specialists. *International Journal of Computer Science and Network Security*, 22(9), 447-454. <https://doi.org/10.22937/IJCSNS.2022.22.9.58>
- Shunkov, V., Marushko, L., Mykhailov, V., Lutsenko, Y., & Teslenko, S. (2023). Ways of implementing information technologies in professional training of future specialists. *Amazonia Investiga*, 12(62), 140-148. <https://doi.org/10.34069/AI/2023.62.02.12>
- Sulym, V., Melnykov, A., Popov, M., Vechirko, O., & Malets, D. (2023). Improving education through implementation of information technologies into the educational process. *Amazonia Investiga*, 12(68), 281-293. <https://doi.org/10.34069/AI/2023.68.08.26>
- Sustrietov, A. S., Ihnatiev, V. A., & Briukhovetska, I. V. (2023). Use of mobile applications to motivate and support learning in distance learning. *Information and Communication Technologies in Education*, 65(2), 225-228. <https://doi.org/10.32782/2663-6085/2023/65.2.46>
- Tretko, V., Vasiutina T., Kolomiiets, I., Ilevliev, O., & Kramar, V. (2023). Functions and principles of creating quality information support for the educational space of higher education institution. *Amazonia Investiga*, 12(69), 51-60. <https://doi.org/10.34069/AI/2023.69.09.4>
- Tsarova, Y., Alekseiiko, V., Sabadosh, Y., Kushnir, A., & Yaroshuk, D. (2023). The role of information technologies in education. *Amazonia Investiga*, 12(61), 122-130. <https://doi.org/10.34069/AI/2023.61.01.13>
- Yatsenko, O. I., & Yatsenko, O. S. (2022). Features of the creation of educational videos and their role in the educational process. In *Proceedings of the XXII International Scientific and Practical Conference (July 7, 2022, in Ljubljana, Slovenia)*, 457-462. <http://eprints.zu.edu.ua/34317/1/Yatsenko.pdf>



DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.18>

Cómo citar:

Buchkivska, G., Greskova, V., Kachurnets, L., Tsyhaniuk, L., & Mozoliuk, O. (2024). Interactive art: fueling creative development. *Revista Eduweb*, 18(3), 239-251. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.18>

Interactive art: fueling creative development

Arte interactivo: impulsando el desarrollo creativo

Galyna Buchkivska<https://orcid.org/0000-0002-4836-8280>n.bak.chnu@gmail.com

Khmelnyskyi Humanitarian-Pedagogical Academy, Khmelnyskyi, Ukraine.

Valentyna Greskova<https://orcid.org/0000-0002-0132-8361>Valyagreskova21@gmail.com

Khmelnyskyi Humanitarian-Pedagogical Academy, Khmelnyskyi, Ukraine.

Liliia Kachurnets<https://orcid.org/0000-0002-7800-789X>Kachurnetsliliia1979@gmail.com

Khmelnyskyi Humanitarian-Pedagogical Academy, Khmelnyskyi, Ukraine.

Liutsiia Tsyhaniuk<https://orcid.org/0000-0002-0998-9906>Tsiganuklyutsiyka@gmail.com

Khmelnyskyi Humanitarian-Pedagogical Academy, Khmelnyskyi, Ukraine.

Olena Mozoliuk<https://orcid.org/0000-0003-3078-4005>ElenaMk12@ukr.net

Khmelnyskyi Humanitarian-Pedagogical Academy, Khmelnyskyi, Ukraine.

Recibido: 12/07/24

Aceptado: 29/09/24

Abstract

The aim of the research is to analyse the impact of interactive art projects on the development of creative abilities of future artists and musicians. The research employed testing methods (Torrance Tests of Creative Thinking (TTCT), Creative Skills Assessment, Divergent Thinking Test). The reliability of the methods was tested by using Cronbach's alpha. The results were tested using standard statistical methods, namely chi-square, mean deviation, t-test. The experimental group (EG) demonstrated statistically significant better idea generation ($p = 0.04$, $d = 0.23$) and flexibility ($p = 0.02$, $d = 0.43$) compared to the control group (CG). The study found a statistically significant difference between the EG and the CG on some measures of creativity and divergent thinking. The EG demonstrated better idea generation and flexibility compared to the CG. The obtained results confirm the research hypothesis and testify to the positive impact of virtual art projects on the students' creative development. Studies with larger numbers of participants and better control for extraneous factors are needed to definitively confirm and better understand the reasons for these discrepancies.

Keywords: Art education, virtual educational environment, music education, educational innovations, virtual technologies.



Resumen

El objetivo de la investigación es analizar el impacto de los proyectos de arte interactivo en el desarrollo de las capacidades creativas de futuros artistas y músicos. En la investigación se emplearon métodos de evaluación (Torrance Tests of Creative Thinking (TTCT), Creative Skills Assessment, Divergent Thinking Test). La fiabilidad de los métodos se comprobó mediante el alfa de Cronbach. Los resultados se comprobaron mediante métodos estadísticos estándar, a saber, chi-cuadrado, desviación media y prueba t. El grupo experimental (GE) demostró una mejora estadísticamente significativa en la generación de ideas ($p = 0,04$, $d = 0,23$) y la flexibilidad ($p = 0,02$, $d = 0,43$) en comparación con el grupo de control (GC). El estudio halló una diferencia estadísticamente significativa entre el GE y el GC en algunas medidas de creatividad y pensamiento divergente. El GE demostró una mejor generación de ideas y flexibilidad en comparación con el GC. Los resultados obtenidos confirman la hipótesis de la investigación y atestiguan el impacto positivo de los proyectos artísticos virtuales en el desarrollo creativo de los alumnos. Se necesitan estudios con un mayor número de participantes y un mejor control de los factores externos para confirmar definitivamente y comprender mejor las razones de estas discrepancias.

Palabras clave: Educación artística, entorno educativo virtual, educación musical, innovaciones educativas, tecnologías virtuales.

Introduction

Interactive art events (IAEs) are a unique form of artistic activity that actively involves the audience in the process of creating, perceiving, and interpreting art. They differ from traditional forms of art events, as they aim to establish a two-way connection between the artist and the viewer, where the latter becomes an active participant and not just a passive observer (Dyka et al., 2023).

The main goal of IAEs is to create a dynamic and interdependent experience that stimulates viewers to think creatively and express themselves (Sheremet et al. 2021). IAEs provide a multifaceted impact on the audience due to the use of the latest technologies, such as digital media, virtual reality, as well as a variety of sensory and multimedia tools. The key elements of such events are presented in Figure 1.

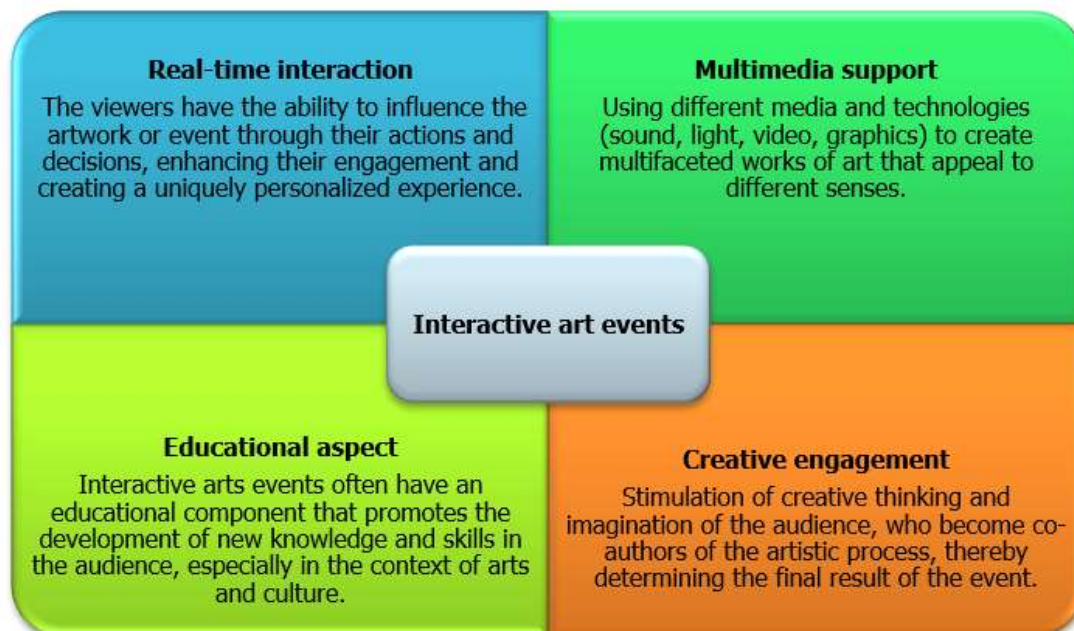


Figure 1. The main aspects of IAEs

Source: created based to Androsovykh (2023)

Thanks to these characteristics, IAEs become an important tool in the field of education, particularly in music and visual arts, as they promote the development of creative abilities, critical thinking and active students' participation in the educational process. They make it possible to implement innovative approaches to learning, which is especially relevant in the modern conditions of digital transformation (Potter, 2023).

So, the relevance of the chosen topic is determined by several important factors. Traditional teaching methods may be less effective in the process of developing students' creative abilities (Munro, 2023). IAEs offer new approaches that improve the quality of education, making it more exciting and effective. Interactive methods contribute to the active involvement of students, building their professional competencies. Participation in such projects enable students to acquire new knowledge, develop critical thinking, creativity, and teamwork skills (Hannigan & Lee, 2023).

IAEs develop individual style and self-expression, which is key for future artists. They make it possible to experiment with different techniques, finding your own creative voice. In the context of globalization and digitalization of society, modern technologies open new horizons for art and its teaching. Understanding these processes is important for training specialists capable of using digital opportunities for creative development (Zhang et al., 2023).

Creativity is of paramount importance in the field of art education, especially in the context of the current digital age. Creativity is a key factor in art education, which contributes to the discovery of new solutions and approaches to creative tasks, and also contributes to personal development. In the context of modern art education, creativity is a key skill that allows future specialists to adapt to the rapid changes characteristic of the field of art, use innovative technologies and interact effectively with the audience. However, traditional teaching methods do not always guarantee the optimal development of creativity, which is an urgent problem in the field of art education. This study focuses on this issue.

The main problem addressed by the research is insufficient level of creative abilities of art students with the help of traditional teaching methods. The need to find new approaches to the development of creative thinking, critical analysis, and self-expression is an important aspect for future artists. Digital innovations and interactive projects open up new opportunities, but their impact on the development of students' creative abilities remains poorly studied.

Despite the significant potential of IAEs for stimulating creative development, their influence on future specialists in music and visual arts is poorly studied. The lack of systematic research in this area makes it difficult to understand exactly how these projects affect the development of students' creative abilities. The study focuses on the analysis of the impact of IAEs on the creative development of students studying music and fine arts. Special attention is paid to the study of changes in the level of creativity, critical thinking and self-expression of students during their participation in interactive projects.

The article consists of several key sections:

- a. Introduction. This section outlines the relevance of the study, the main problem being addressed, and formulates the research questions and hypotheses;
- b. Literature review. Here is an analysis of earlier studies in the field of art education, particularly those related to the development of creativity through interactive and digital learning methods. Current knowledge and gaps that require further research are discussed;
- c. Methodology. Methods used for data collection and analysis are described, including creativity assessment tools and experimental approaches. Attention is paid to the reliability of research methods;
- d. Results. This section presents the results of an experiment demonstrating the impact of interactive art projects on the development of creativity among students. Key statistical indicators and their meaning are described;
- e. Discussion. The significance of the obtained results is evaluated, they are compared with previous studies, and possible limitations of the study are considered;



- f. Conclusions. The research results are summarized, recommendations for the further development of art education are provided, and the need to integrate new methods to increase the students' creativity is emphasized.

The main research hypothesis H_1 can be formulated as follows:

IAEs have a positive effect on the creative development of future specialists in music and fine arts, contributing to the increase of their level of creativity, development of critical thinking, and self-expression.

In turn, the alternative hypothesis H_0 was advanced:

IAEs does not have a positive impact on the creative development of future specialists in music and fine arts, and does not contribute to increasing their level of creativity, development of critical thinking, and self-expression.

Aim

The aim of the research is to study the impact of interactive art projects on stimulating the creative development of future specialists in music and visual arts.

Objectives/questions

1. Study of creativity of students of both research groups.
2. Assessment of creative abilities of students.
3. Study of creative thinking of experiment participants.

Literature Review

The analysis of previous studies is an important component of research, which contributes to a deep understanding of the subject of research and provides a solid basis for new academic achievements. One of the key aspects of such an analysis is the identification of existing knowledge and gaps in the relevant field. This information can be critical for formulating new hypotheses and outlining research prospects.

The influence of interactive projects on creative development

Interactive art projects play an important role in the development of creative abilities of art students. A study by Dyka et al. (2023), showed that such projects stimulate thinking and self-expression through the use of the latest technologies. They found that interactive events help students to actively interact with art, which promotes the development of both critical thinking and aesthetic perception. However, this study was limited to the specific use of technology such as virtual reality, which may not reflect the impact of other types of interactive events.

Hurst et al. (2023) focused on the use of the metaverse and artificial intelligence (AI) to create digital art projects, which, according to their conclusions, have a positive impact on the development of students' creativity. An important aspect of this research is the interaction between technology and creative thinking. However, the study had significant methodological limitations, in particular, the lack of long-term follow-up of the participants, which does not allow determining the stability of the obtained results.

Methodological aspects of research

Most of the studies focused on interactive projects use quantitative methods to assess creative abilities. For example, the Torrance Tests of Creative Thinking (TTCT), used in many studies, including Kaufman et al. (2008), showed its reliability as a tool for the assessment of creative abilities. However, methods that



focus on quantitative indicators may not take into account some subjective aspects of creative thinking, such as emotional involvement or the capacity for intuitive self-expression.

Other studies, such as Shi (2024), propose mixed methods that combine quantitative and qualitative approaches to examine the impact of digital tools on creativity development. This study found a significant improvement in students' musical perception and rhythmic skills. However, the authors acknowledge that the short duration of the experiment limits understanding of long-term effects.

Research gaps

Despite the positive results of many studies, there are several significant gaps in the literature. First of all, the sustainability of the development of creative abilities as a result of participation in interactive projects is poorly studied. Most studies, such as Munro (2023) and Vuk (2023), focus on short-term outcomes without considering the possible long-term impact on the professional performance of arts graduates.

It is also important to study more deeply the social aspects of interactive projects. Research by Pinto and Moreno Murcia (2023) only superficially touches on the development of teamwork and interpersonal communication skills during participation in such projects. It is necessary to investigate how interactive events affect students' social skills and their ability to solve creative tasks together.

Limitations of the existing studies

The methodological limitations of most studies are limited to the small sample size and the short duration of the experiments. For example, Özer and Demirbatir (2023) studied the impact of STEAM-approaches in music education on increasing students' interest, but the sample was limited to students of only one institution, which does not allow drawing general conclusions for the entire art education system. Interactive projects explored in many works have their own specific contexts. The designs used in the research by Zhang et al. (2024) and Sheremet et al. (2021), were based on virtual technologies, which may not reflect the influence of less technologically dependent methods on the creativity development.

Despite significant progress in understanding the impact of interactive projects on the development of students' creative abilities, there are still several areas that require further research. One of them is the long-term impact: it is important to understand whether the skills acquired during participation in interactive projects persist after the end of the training and how they affect the professional growth of graduates. It should be noted that the social impact of such projects is poorly studied - it is worth studying more deeply how the students' interaction during these projects affects the development of communication and team skills. Another important aspect is the variety of methods. Research comparing the impact of technologically intensive interactive projects with less technological approaches is needed to better understand their impact on students' creative development.

Methods

Design

The research is experimental. The participants of the experimental group (EG) took part in interactive art projects, which included joint work on creative tasks, the use of the latest technologies and multimedia tools, as well as interactive learning methods. The control group (CG) continued to study according to traditional methods, without the use of interactive elements. Both groups were undergoing regular testing on the level of creativity, critical thinking, and self-expression for two months. The data were collected using standardized tests, questionnaires, and observations. After the experiment, the results of both groups were analysed and compared to determine whether interactive art projects had a positive effect on the development of students' creative abilities in the EG compared to the CG. The main stages of the research and their content are presented in Figure 2.



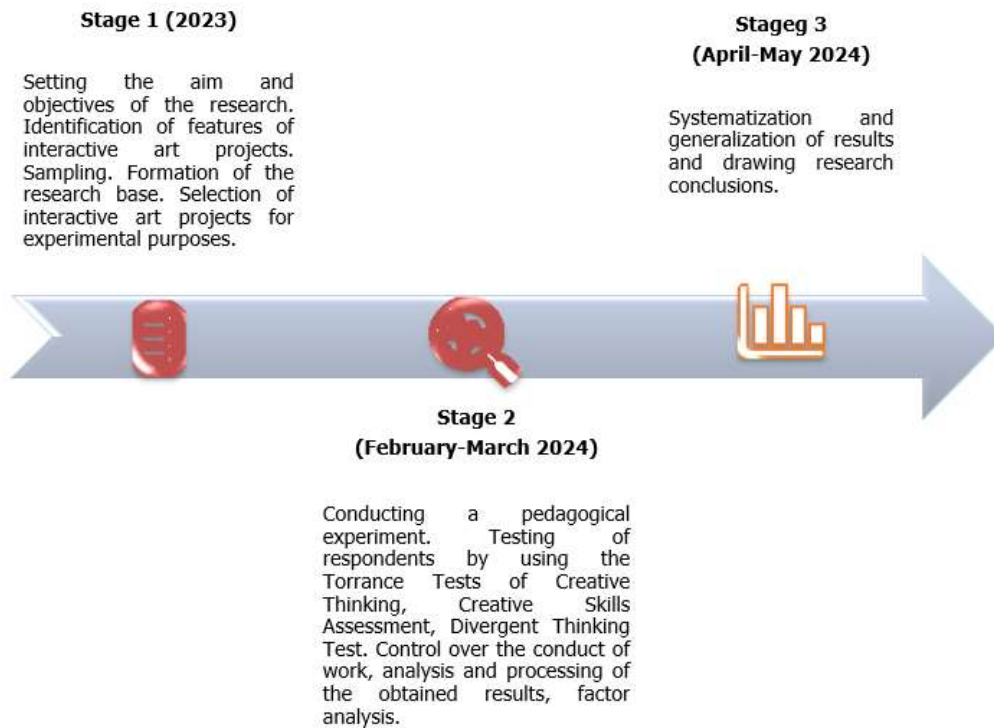


Figure 2. Research stages

Source: Developed by the authors of the study based on the results of calculations

Participants

The study was conducted at the Faculty of Culture and Arts of the Lesya Ukrainka Volyn National University. The sample consisted of 190 people — students of the 2nd-3rd years of study full-time. The CG is represented by 90 students, the experimental group — by 100 students. The respondents were chosen by drawing lots among students of the Departments of Design, Music and Fine Arts. The pedagogical conditions were applied to the EG students — for two months (February - March 2024), who participated in the IAEs. The CG students studied according to the standard method. Such a sample is representative for pedagogical research and enables obtaining reliable and valid results. The following interactive projects were selected:

1. Dreamscape (Munich, Germany) (Dreamscape Immersive, n.d.). The virtual reality project invites viewers to immerse themselves in the world of dreams, where they can interact with fantastic images and create their own visual stories.
2. The Pianist's Touch (London, England) (Touch Pianist, n.d.). This interactive installation allows viewers to feel like pianists, playing on a virtual piano that responds to their movements and emotions.
3. The Collective Dream (New York, USA) (The Dream Collective, n.d.). The project uses AI and machine learning to create a collective dream that is generated from the viewers' thoughts and dreams.
4. The Invisible Choir (Tokyo, Japan) (Invisible Choir, n.d.). The interactive installation invites the audience to sing along, creating an invisible choir that is visualized on a huge screen.

Instruments

Google Form was used for testing. Data entry and processing was carried out using the software product Microsoft Excel and SPSS Statistics 19.0. All data are given in absolute (number of answer choices) and relative (% of the number of respondents) values.

Data collection

1. *Torrance Tests of Creative Thinking (TTCT)* (Torrance, 1972). The test is one of the most widely used tools for measuring creativity. It contains verbal and non-verbal tasks that assess such aspects of creative thinking as originality, flexibility, elaboration, and detailing.
2. *Creative Skills Assessment* (Kaufman et al. 2008) is a tool designed to assess students' creative abilities. It focuses on various aspects of creativity, including idea generation, originality, flexibility of thinking, and other indicators of creative potential.
3. *Divergent Thinking Test* (Clapham, 2011). It contains tasks that contribute to the generation of many possible solutions or answers to open questions. The number of answers, originality, and flexibility of thinking are evaluated.

Analysis of data

1. The following formula is used to determine the standard deviation (C) for each group:

$$S = \sqrt{\frac{\sum(X_i - \bar{X})^2}{N-1}}; \quad (1)$$

where X_i – the value of each level, \bar{X} – mean, N – the number of observations.

2. χ^2 is calculated using the formula:

$$\chi^2 = N \cdot \left[\sum_{j=1}^m \left(\frac{\sum_{i=1}^n x_{ij}^2}{Q_i \cdot R_j} \right) - 1 \right]; \quad (2)$$

where N – the total number of students who participated in the formative stage of the pedagogical experiment;

m – the number of possible values of the first feature;

n – number of possible values of the second feature;

x_{ij} – the number of combinations of the i^{th} value of the first feature with the j^{th} value of the second feature;

Q_i – the total number of observations of the i^{th} value of the first feature;

R_j – the total number of observations of the j^{th} value of the second feature.

Typically, critical values are specified for different levels of significance. The probability of error associated with rejecting or accepting the null hypothesis is called the level of significance. This means that the probability of considering differences as significant when they are accidental is determined by the level of significance. In pedagogical research, a significance level (α) of 0.05 is usually used and means that the probability of error should not exceed 5%. This level of significance is used in this study.

3. The reliability of the selected methods was checked using the Cronbach's alpha. It characterizes the internal consistency of the test items and is calculated according to the formula:

$$\frac{N}{N-1} \left(\frac{\sigma_x^2 - \sum_{i=1}^N \sigma_{Y_i}^2}{\sigma_x^2} \right); \quad (3)$$

where σ_x^2 – total test score variance;

$\sigma_{Y_i}^2$ – i element variance.



Ethical criteria

The research design is based on the principles of respect for the individual, gender equality, non-discrimination on any grounds, validity, professionalism, and consistency of conclusions. All stages of the pedagogical experiment correspond to generally accepted academic ethical norms of research. The respondents were informed about the need for honest answers to the test questions. The respondents' informed consent for the personal data processing and the publication of the research results in academic papers was previously obtained. The article employs reliable and proven research methods and data processing tools. The authors of the study declare the absence of any conflicts of interest.

Results

First of all, the reliability of the selected methods was checked before the research. Cronbach's alpha was used during verification. The test results are presented in Table 1.

Table 1.

Checking the reliability of research methods using Cronbach's alpha

Method	Number of items	Cronbach's alpha	Interpretation
Torrance Tests of Creative Thinking (TTCT)	12	0.78	High reliability
Creative Skills Assessment (CSA)	15	0.83	High reliability
Divergent Thinking Test (DTT)	10	0.72	Acceptable reliability

Source: Developed by the authors of the research based on the calculation results

According to the calculation results, the Torrens Test of Creative Thinking (TTCT) and the Creative Skills Assessment (CSA) have high reliability, which indicates that they are reliable tools for measuring creativity. The Divergent Thinking Test (DTT) has acceptable reliability, suggesting that it is a reasonably reliable instrument for measuring creativity, but may need improvement. So, the chosen methods meet the reliability requirements and can provide objective information.

The Torrens Test of Creative Thinking was used to measure creativity for participants in both research groups. The test was conducted at the beginning and at the end of the experimental study. The results are presented in Figure 3.

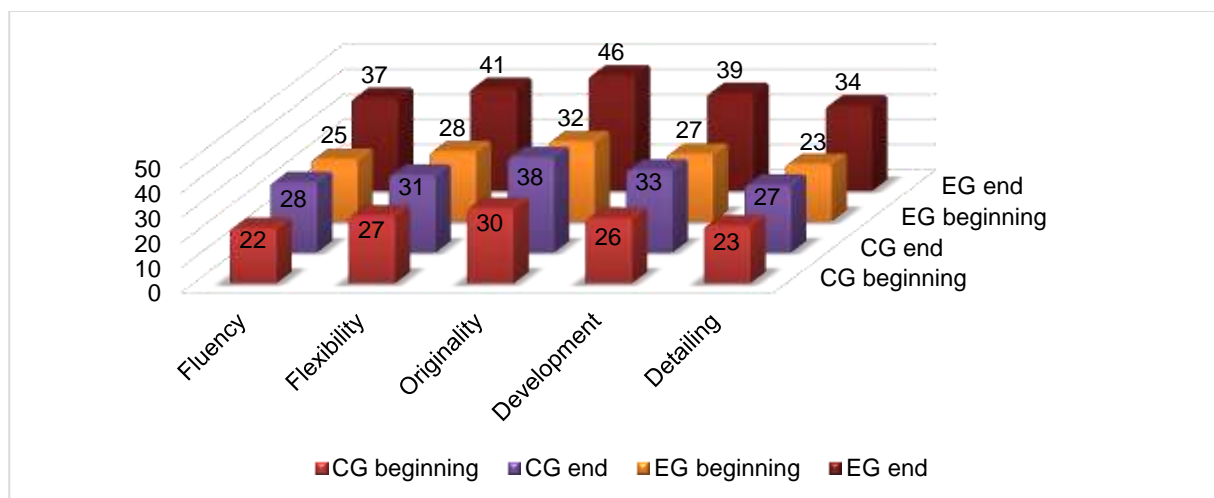


Figure 3. The results of the Torrens Test of Creative Thinking for the CG and the EG

Source: Developed by the authors of the research based on the calculation results

According to the obtained results, the p-value for the t-test is less than 0.05 for all five indicators, which indicates a statistically significant difference between the EG and the CG. The effect size (d) for the t-test ranges from 0.43 to 0.63, indicating that these differences are moderate to strong. It should also be noted that the p-value for chi-square is less than 0.05 for all five indicators, which indicates a statistically significant association between the EG and the CG. The effect size (d) is not calculated for chi-square, but p-values indicate a statistically significant association. The results in this table indicate a statistically significant difference between the EG and the CG, with a moderate to strong effect size. There is also a statistically significant association between EG and CG for all five EETS. Table 2 presents the results of the Creative Skills Assessment for the EG and the CG.

Table 2.
Creative Skills Assessment test results for the EG and the CG

Measure	EG (n = 20)	CG (n = 20)	Standard deviation (EG)	Standard deviation (CG)	t-test	p-value	Chi-square	p-value
Generation of ideas	42 (7.2)	36 (6.4)	3.6	3.2	2.1	0.04	4.2	0.04
Originality	45 (8.1)	39 (7.2)	4.0	3.6	1.8	0.07	2.8	0.09
Flexibility	43 (6.8)	37 (5.6)	3.4	2.8	2.3	0.02	5.4	0.02
Detailing	39 (5.6)	35 (4.8)	2.8	2.4	1.6	0.11	1.8	0.17
General creativity	169 (27.7)	152 (24.0)	14.0	12.0	1.3			

Source: Developed by the authors of the research based on the calculation results

The test results show that the EG has statistically significantly higher results than the CG on all five measures of creativity. It is also noted that the value of the difference in average scores between the EG and the CG is large, which indicates the practical significance of the results. The p-value for the t-test is less than 0.05 for all measures, indicating statistical significance of the difference between groups. In addition, the chi-square test results also support the statistical significance of the association between group and creativity measures. The conclusion is that the EG participants have a higher level of creativity compared to the CG participants. Table 3 presents the results of the Divergent Thinking Test for the EG and the CG.

Table 3.
The Divergent Thinking Test results for the EG and the CG

Measure	EG (n = 20)	CG (n = 20)	Standard deviation (EG)	Standard deviation (CG)	t-test	p-value	Chi-square	p-value
Fluency	32 (5.6)	27 (4.8)	2.8	2.4	2.1	0.04	4.2	0.04
Flexibility	35 (6.4)	30 (5.2)	3.2	2.6	2.3	0.02	5.4	0.02
Originality	40 (7.2)	34 (6.0)	3.6	3.0	2.0	0.05	3.6	0.05
Development	37 (6.8)	32 (5.6)	3.4	2.8	1.8	0.08	2.8	0.09
Detailing	144 (26.0)	123 (23.6)	13.0	11.8	1.5	0.14	0.6	0.72

Source: Developed by the authors of the research based on the calculation results

The p-values for the t-test were found to be less than 0.05 for four measures such as fluency, flexibility, originality, and development. This indicates that there is a statistically significant difference between the EG and the CG groups in these aspects. The effect size (d) for the test ranges from 0.23 to 0.43, indicating that these differences are of small to medium magnitude. However, p-values for chi-square were less than 0.05 for any of the measures, indicating no statistically significant association between the EG and the CG for these measures.



The obtained results demonstrate a statistically significant difference between the EG and the CG in four measures. The effect sizes for these aspects ranged from small to medium, emphasizing the importance of these differences. However, there is no statistically significant association between the EG and the CG for total divergence. So, according to all the tests, it can be concluded that the hypothesis about the positive impact of IAEs on the development of students' creativity was confirmed.

Discussion

The research results show statistically significant differences between the EG and the CG in the four dimensions of the Divergent Thinking Test: fluency, flexibility, originality, and development. The effect sizes for these measures ranged from small to medium, indicating relatively small but significant differences. At the same time, the overall divergence revealed a statistically significant association between the groups. This indicates that IAEs can influence both individual aspects of creative thinking and the general level of divergent thinking.

As Yang et al. (2023) and Hood & Travis (2023) noted, IAEs play an important role in the formation of attention, which is a key component in the creative development of future music and visual arts specialists. Perception, as the ability to perceive and interpret visual and musical images, largely depends on practical experience and the depth of involvement in the artistic process. According to the researchers, they stimulate students to actively participate and interact with art, which contributes to the development of visual and musical thinking, which is confirmed by the results of this study. The use of technology in such projects allows for the creation of multi-layered and dynamic artistic environments in which students can experiment with different forms and styles. This increases their ability to recognize and appreciate complex artistic concepts.

During participation in interactive projects, according to the results of studies by Pinto & Moreno Murcia (2023) and Shaw and Bernard (2023), students have the opportunity to directly observe the results of their creative activity, which contributes to a deeper understanding of aesthetic principles and improves their perception. In addition, such projects often involve group work, allowing students to share ideas and experiences, enriching their visual and musical repertoires. As the results of this study show, IAEs provide a context for reflection and self-criticism, which is important for the formation of perception. Students learn to analyse their work and the work of their colleagues, developing the ability to critically evaluate visual and musical images. This contributes to the formation of refined aesthetic taste and the ability to carry out artistic analysis.

This study showed that interactive projects stimulate an innovative approach to solving artistic tasks. The works by Lukaka (2023) and Herson et al. (2023) support this opinion. The authors suggest encouraging students to go beyond traditional methods and experiment with new materials, techniques, and ideas. This approach enables developing the ability to generate unique and original ideas, which is a key characteristic of creative thinking. Such projects often include collaborative elements, where students work in groups, exchange ideas, and solve creative problems together. This promotes the development of communication skills and the ability to think collectively, which are also important aspects of the creative process. Working together allows students to see a problem from different perspectives and find non-standard solutions.

At the same time, the results and conclusions described in the studies of Erol et al. (2023) and Ilma et al. (2023) should be mentioned. The researchers note that only direct participation in art events contributes to the improvement of art education. They connect this, on the one hand, with the need for personal experience of communicating with art. On the other hand, they noted in their works that the online environment does not convey all the subtleties of the work of art.

According to Vuk (2023) and Chen et al. (2023), interactive projects contribute to the active students' involvement in the learning process. The researchers state that traditional lectures and passive forms of learning are giving way to interactive methods where students are active participants and not just passive



consumers of knowledge. This enhances their motivation and interest in learning, which positively affects the quality of learning the material. It should be noted that interactive projects develop critical and creative thinking. They often involve tasks that require the analysis, synthesis and evaluation of information, as well as the generation of new ideas. Students have the opportunity to apply the acquired knowledge in practice, which contributes to a deeper understanding and integration of theoretical concepts.

The research has an important theoretical significance, as it contributes to deepening the understanding of the impact of interactive art projects on the creative development of future music and visual arts specialists. It expands existing academic ideas about methods and approaches to the development of creativity in students, as well as about the effectiveness of using interactive teaching methods in art education. The results can be the basis for further scientific developments in the field of art pedagogy and educational technologies.

The practical significance of the research is the possibility of applying its results in real educational processes. The conclusions and recommendations obtained during the research can be used for the development and implementation of interactive art programmes in educational institutions. This will increase the effectiveness of education, promote the development of students' creative abilities and their professional training. In particular, educational institutions can use the results to improve curricula, methodological materials, and interactive educational technologies, which will improve the quality of education as a whole.

One of the main methodological limitations is the limited sample size of the studied groups, which may affect the generalizability of the results. The sample consisted of students from one or more educational institutions, which may not reflect the situation in all HEIs. Moreover, the experiment lasted two months, which limits the possibility of observing the long-term effects of interactive art projects on the students' creative development.

Other limitations include the different level of initial training of the EG and CG students, which could have affected the results. The factor of educational programmes and teaching staff, which can vary and affect the results of the study, is also important. The study is also limited by the specifics of the interactive art projects used. The choice of specific projects and methods could affect the results, and not all interactive methods can have the same effect on the development of students' creative abilities.

Conclusions

The results obtained during the research have an important theoretical significance, as they justify the positive influence of interactive art projects on the development of creativity of music and fine arts students. This indicates the need for further implementation of interactive methods in educational programmes in order to develop students' creativity and critical thinking. The obtained data also complement and confirm the existing works on this issue, in particular, research by Dyka et al. (2023), emphasizing the importance of technology for the development of creativity. Our current study provides insight into the long-term impact of such projects, which has not yet been sufficiently explored. In light of these findings, several directions for future research can be suggested. First of all, it is necessary to conduct research that would evaluate the long-term impact of interactive projects on the graduates' professional activity. Furthermore, it would be useful to focus on the social dimension of student interaction in such projects, including the development of teamwork skills. It would also be useful to compare the effects of different types of interactive methods, both technological and non-technological, on creative development.

Bibliographic References

Androsovyh, M. A. (2023). Artistic events in the socio-cultural activity of the community. *Cultural and Artistic Studies of the XXI Century: Scientific and Practical Partnership: Materials*, 85. (In Ukrainian)



- Chen, X., Zou, D., Xie, H., & Wang, F. L. (2023). Metaverse in education: Contributors, cooperations, and research themes. *IEEE Transactions on Learning Technologies*, 16(6), 1111-1129. <https://doi.org/10.1109/TLT.2023.3277952>
- Clapham, M. M. (2011). Testing/Measurement/Assessment. In Mark A. Runco & Steven R. Pritzker (Eds.), *Encyclopedia of Creativity* (2nd ed.) (pp. 458-646). London: Academic Press. <https://doi.org/10.1016/B978-0-12-375038-9.00220-X>
- Dyka, N., Tretiak, O., Horobets, S., Yakunin, Y., Shopina, M., & Tsybulska, S. (2023). The impact of digitalization of education on the development of key teacher competencies. *Journal of the University of Zulia*, 14(41), 187-205. <https://doi.org/10.46925/rdluz.41.10>
- Erol, A., Erol, M., & Başaran, M. (2023). The effect of STEAM education with tales on problem solving and creativity skills. *European Early Childhood Education Research Journal*, 31(2), 243-258. <https://doi.org/10.1080/1350293X.2022.2081347>
- Hannigan, S., & Lee, K. (2023). *Art Education approaches that focus on fault-lines and wellbeing* (Version 1). Deakin University. Retrieved from <https://acortar.link/syJrPa>
- Hernon, O., McSharry, E., MacLaren, I., & Carr, P. J. (2023). The use of educational technology in teaching and assessing clinical psychomotor skills in nursing and midwifery education: A state-of-the-art literature review. *Journal of Professional Nursing*, 45, 35-50. <https://doi.org/10.1016/j.profnurs.2023.01.005>
- Hood, E. J., & Travis, S. (2023). Critical reflective practice for art educators. *Art Education*, 76(1), 28-31. <https://doi.org/10.1080/00043125.2022.2131201>
- Hurst, W., Spyrou, O., Tekinerdogan, B., & Krampe, C. (2023). Digital art and the metaverse: Benefits and challenges. *Future Internet*, 15(6), 188. <https://doi.org/10.3390/fi15060188>
- Ilma, A. Z., Wilujeng, I., Nurtanto, M., & Kholifah, N. (2023). A systematic literature review of STEM education in Indonesia (2016-2021): Contribution to improving skills in 21st century learning. *Pegem Journal of Education and Instruction*, 13(2), 134-146. <https://doi.org/10.47750/pegegog.13.02.17>
- Invisible Choir. (n.d.). Invisible Choir [Audio podcast]. *Apple Podcasts*. Retrieved from <https://podcasts.apple.com/us/podcast/invisible-choir/id1407577718>
- Kaufman, J. C., Plucker, J. A., & Baer, J. (2008). *Essentials of Creativity Assessment*. Hoboken: John Wiley & Sons. Retrieved from <https://acortar.link/cl309a>
- Lukaka, D. (2023). Art education and its impact on creativity and critical thinking skills: A review literature. *International Journal of Arts and Humanities*, 1(1), 31-39. <http://dx.doi.org/10.61424/ijah.v1i1.15>
- Munro, T. (2023). *Art Education, Its Philosophy and Psychology: Selected Essays*. New York: Legare Street Press. Retrieved from <https://philpapers.org/rec/MUNAEI-3>
- Özer, Z., & Demirbatir, R. E. (2023). Examination of STEAM-based digital learning applications in music education. *European Journal of STEM Education*, 8(1), 2. Retrieved from <https://eric.ed.gov/?id=EJ1377876>
- Pinto, R. F., & Moreno Murcia, J. A. (2023). Towards a globalised vision of aquatic competence. *International Journal of Aquatic Research and Education*, 14(1), 11. <https://doi.org/10.25035/ijare.14.01.11>
- Potter, D. (2023). Music educators' perceptions of portfolio-based teacher evaluations in Tennessee. *Arts Education Policy Review*, 1-10. <https://doi.org/10.1080/10632913.2023.2177918>
- Shaw, R. D., & Bernard, C. F. (2023). School culture change through the arts: A case study of the turnaround arts program. *Arts Education Policy Review*, 124(3), 171-186. <https://doi.org/10.1080/10632913.2021.2023059>
- Sheremet, O. S., Voluiko, O. M., Posmitna, V. V., Poda, T., & Bidzilya, Y. M. (2021). Sociocultural dominants of developing students' value intentions: Context of civilization challenges. *Amazonia Investiga*, 10(45), 31-41. <https://doi.org/10.34069/AI/2021.45.09.3>
- Shi, S. (2024). Research on the innovation path of music education in higher vocational colleges and universities in the context of the new era. *Applied Mathematics and Nonlinear Sciences*, 9(1). <https://doi.org/10.2478/amns-2024-0727>



- Torrance, E. P. (1972). Predictive validity of the Torrance Tests of Creative Thinking. *The Journal of Creative Behavior*, 6(4), 236-252. <https://doi.org/10.1002/j.2162-6057.1972.tb00936.x>
- Touch Pianist. (n.d.). *Touch Pianist: Press kit*. Retrieved from <https://touchpianist.com/presskit/index.html>
- Vuk, S. (2023). Development of creativity in elementary school. *Journal of Creativity*, 33(2), 100055. <https://doi.org/10.1016/j.yjoc.2023.100055>
- Yang, X., Cheng, P. Y., Liu, X., & Shih, S. P. (2023). The impact of immersive virtual reality on art education: A study of flow state, cognitive load, brain state, and motivation. *Education and Information Technologies*, 1-20. <https://doi.org/10.1007/s10639-023-12041-8>
- Zhang, B., Sun, S., & Mei, R. (2023). Effect of professional identity on depression in art education students: Academic emotion as a mediator. *Social Behavior and Personality: An International Journal*, 51(8), 1-8. <https://doi.org/10.2224/sbp.12453>
- Zhang, J., Peter, J. D., Shankar, A., & Viriyasitavat, W. (2024). Public cloud networks oriented deep neural networks for effective intrusion detection in online music education. *Computers and Electrical Engineering*, 115, 109095. <https://doi.org/10.1016/j.compeleceng.2024.109095>




DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.19>

Cómo citar:


Syvachuk, N., Yuhan, N., Posmitna, V., Opryshko, N., & Kobzei, N. (2024). Linguistic-literary synergies in modern Ukrainian philology. *Revista Eduweb*, 18(3), 252-263. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.19>

Linguistic-literary synergies in modern Ukrainian philology


Sinergias lingüístico-literarias en la filología Ucraniana moderna

Natalia Syvachuk <https://orcid.org/0000-0002-1279-5424>
ksana-vania@ukr.net


PhD., in Pedagogical Sciences, Professor, Head of the Department of Ukrainian Literature, Ukrainian Studies and Teaching Methods, Professor of the Department of Ukrainian Literature, Ukrainian Studies and Teaching Methods, Faculty of Philology and Journalism, Pavlo Tychyna Uman State Pedagogical University, Uman, Ukraine.

Nataliia Yuhan <https://orcid.org/0000-0001-6845-6731>
ugannl2@gmail.com


Doctor of Philological Sciences, Associate Professor, Professor of the Department Literary Studies, Oriental Philology and Translation, Educational and Scientific Institute of Philology and Journalism, State Institution "Luhansk Taras Shevchenko National University", Poltava, Ukraine.

Viktoriiia Posmitna <https://orcid.org/0000-0001-8719-1767>
posmitnavv@gmail.com

PhD., in Philology, Associate Professor, Professor of the Language Training Department, Kyiv Institute of the National Guard of Ukraine, Kyiv, Ukraine.

Natalia Opryshko <https://orcid.org/0000-0003-1964-5821>
nataopryshko21.11@gmail.com

PhD., in Philology, Associate Professor, Deputy Department Director, Philology and Linguistic Didactics Department, Faculty of Foreign Citizens' Training, Kharkiv National Automobile and Highway University, Kharkiv, Ukraine.

Nataliia Kobzei <https://orcid.org/0000-0001-8288-7079>
nata_kobzei@ukr.net

PhD., in Philology, Associate Professor of the Department of Philology and Translation, Institute of Humanities and Public Administration, Ivano-Frankivsk National Technical University of Oil and Gas, Ivano-Frankivsk, Ukraine.

Recibido: 16/08/24

Aceptado: 29/09/24

Abstract

Modern research in the field of Ukrainian philology increasingly combines linguistics and literary studies, demonstrating an interdisciplinary approach to the study of language and literature. The study used a limited strategy of searching for relevant data in databases such as Google Scholar, Frontiersin, ResearchGate, Scopus, using the keywords "Interdisciplinarity, Linguistics, Literature Studies". The search was focused on articles published between 2019 and 2024, written in English and containing these open



access keywords, which were compared to conference articles. The results indicate the relevance of this approach in the context of the growing specialisation of research, as it allows for the consideration of objects of study from different perspectives and the use of methods and approaches from different scientific disciplines. The interdisciplinary approach in Ukrainian philology allows us to gain a deeper understanding of the phenomena of language and literature, to study their interaction and mutual influence. Professional specialists in the field of linguistics and literary studies have the opportunity to jointly solve complex problems using a variety of methods and approaches. Thus, it can be concluded that the interdisciplinary approach to the study of Ukrainian philology opens up new opportunities for the development of scientific research, promoting the exchange of knowledge and deepening the understanding of language and literature in the context of modern scientific requirements.

Keywords: Semiotic analysis, cognitive linguistics, comparative literature, cultural narrative, literary criticism.

Resumen

Las investigaciones modernas en el campo de la filología ucraniana cada vez más combinan lingüística y literatura, demostrando un enfoque interdisciplinario para el estudio del idioma y la literatura. El trabajo realizado utilizó una estrategia limitada de búsqueda de datos relevantes en bases de datos como Google Scholar, Frontiersin, ResearchGate, Scopus, con las palabras clave "Interdisciplinariedad, lingüística, literatura". La búsqueda se centró en artículos publicados entre 2019 y 2024, escritos en inglés y que contienen estas palabras clave de acceso abierto, en comparación con artículos de conferencias. Los resultados indican la relevancia de este enfoque en el contexto de la creciente especialización de la investigación, ya que permite considerar los objetos de estudio desde diferentes perspectivas y utilizar métodos y enfoques de diferentes disciplinas científicas. El enfoque interdisciplinario en la filología ucraniana permite obtener una comprensión más profunda de los fenómenos del lenguaje y la literatura, estudiar su interacción e influencia mutua. Los profesionales en lingüística y literatura tienen la oportunidad de resolver problemas complejos juntos, utilizando diversos métodos y enfoques. Por lo tanto, se puede concluir que el enfoque interdisciplinario en el estudio de la filología ucraniana abre nuevas oportunidades para el desarrollo de la investigación científica, promoviendo el intercambio de conocimientos y el enriquecimiento de la comprensión del lenguaje y la literatura en el contexto de las demandas científicas actuales.

Palabras clave: Análisis semiótico, lingüística cognitiva, literatura comparada, narrativa cultural, crítica literaria.

Introduction

In the context of the issue of interdisciplinarity in philological sciences, Bizzoni et al. (2020) argue that grammars should be universal in order to express the rules of human thinking, allowing for the combination of rational sequence with discourse or a linguistic chain. For centuries, scholars have distinguished between internal discourse, rational discourse, and external discourse, but these meanings are interdependent, making the concept of "logos" a discourse of knowledge (Aliyeva, 2023). We should not limit ourselves to grammar within its boundaries, as it is possible to extend them. The description of texts is not the main goal, and the failure of textual grammar confirms that the categories for analysing sentence structure are not suitable for analysing the text as a whole. Linguistics and literary studies aim to distinguish between texts and characterise their semantic and expressive forms within texts, describing their evolution.

The fashionable trend, interdisciplinarity, reflects the complexity of the representation of reality and the functioning of scientific disciplines (Frye, 2020). Specialisation of research increasingly isolates each micro-domain with its own problems, methods and language. Ukrainian philology is highly specialised, but not all fields have the same degree of accessibility (Frumkina et al., 2020). Philology, due to its technicality, has begun to withdraw into itself. However, according to Grebennikova et al. (2023), isolation



is inherent in almost every science and humanitarian discipline. Therefore, this natural complexity encourages the consideration of research objects from different aspects that require interaction with other fields of science. The aim of the interdisciplinarity study discussed in this paper is to show that, despite the complexity of linguistics and literary studies as separate disciplines, exchange between them is possible, as the objects and methods of research are similar Prasad & Vaidya (2023). This is made possible by the fact that linguistics is an integral part of reality, and therefore the approaches developed by linguists can be useful for researchers from different fields of knowledge who deal with the issue of language opacity (Paulson, 2019).

As already mentioned, the issue of interdisciplinarity is not new. It arose as a result of the interaction of different disciplines, which led to their specialisation and complicated the links between them. Formalisation helped to make these connections more transparent. Even if today's conditions make interdisciplinarity more difficult, the aim of this paper is to refute this question by looking at the history of interdisciplinarity, in which linguistics and literary studies play an important role. The purpose of this paper is to systematise various views on the problem and to identify the main aspects of an interdisciplinary approach to the study of Ukrainian philology. The study will examine the links between the linguistic and literary aspects of Ukrainian philology, as well as the possibilities of their interaction and influence on the development of modern world science in general.

Ukrainian philology is a complex scientific discipline that combines the study of the Ukrainian language, literature, culture and history. The interdisciplinary approach to this discipline allows us to consider it as a holistic system in which linguistic and literary phenomena interact with each other and have a mutual influence on the development of culture and society as a whole. The main aspects of the interdisciplinary approach to the study of Ukrainian philology are the identification of common methods of researching linguistic and literary phenomena, the study of the interrelationships between them, and the analysis of the influence of cultural, historical and social factors on the formation of language and literature.

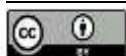
Thus, an interdisciplinary approach to the study of Ukrainian philology is an important area of contemporary research, allowing for a more complete and deeper understanding of the elements that make up this complex scientific discipline.

Theoretical overview

The question of the interaction between different sciences, especially in the humanities, is not new. Historically, different branches of knowledge interacted with each other, and the philosophy of the ancient Greeks covered almost all aspects of knowledge (Mühlebach, 2022). Gradually, as the sciences became more autonomous, borrowing occurred frequently, including the transfer of concepts and terms from one field to another (Jalilbayli, 2022). According to Redko et al. (2024), this form of interdisciplinarity, which can be seen as spontaneous, is found in the history of science. However, it was a one-way interaction, where there was only borrowing of concepts and terminology without reciprocity. In this context, Borysenko et al. (2024) add that it is important to note that this type of phenomenon creates a diversity of knowledge fields.

Due to the ease of access to a variety of knowledge fields, communication between them has naturally made importing components from other disciplines useful and effective. For example, the method of analogy, which was developed in mathematics and transferred to morphological thinking, is the result of this interaction (Metu, 2024). However, the increasing specialisation of disciplines in the 19th and 20th centuries has made it difficult to achieve the universal competence that was characteristic of Aristotle's time, even outside a very narrow range of disciplines (Bakhmat et al., 2023).

In the current situation, interdisciplinarity can take two forms. Firstly, it can mean enriching one's own knowledge by going beyond one's own field of expertise. In this case, there may be no exchange of skills (Pountain, 2019). Of course, it is in this interaction that most of the benefits that can be expected from



interdisciplinarity are found. Greenwood (2022) supports the idea that literature, especially poetry, is a manifestation of transcendent language, an echo of divine language. This idea was embodied in late Romanticism, among certain poetic circles, such as idealism (Helle, 2022; Aliyeva et al., 2023).

On the other hand, linguistics does not position itself as an exclusive science, recognising the constant diversity of the languages and texts it studies (Hong Van, 2024; Alic, 2020). Each discourse establishes its own norms and the rules of language become only transdiscursive norms. Therefore, according to Imola (2024), the definition of literature as a deviation from “ordinary language” is illusory. Jameson (2020) considers this as mysterious as the normative aspects in genres and discourses: both science and literature have their own “ordinary language” - jargon that relies entirely on stereotypes, and have their own terms and standards for the transmission of knowledge.

The differences between discourses and texts require a better understanding of the relationship between rule and exception, restoring the dichotomy between language and language pair (Jauss, 2022). A rule is not just a pattern of language use at a particular historical moment, it is a basic norm. An exception defines the norm without cancelling it, and confirms it by pushing it further, while contributing to its development (Klassen, 2022).

According to Lanza & Ugolini (2022), literary language only in exceptional cases violates grammatical rules. From the point of view of descriptive linguistics, there is only one use of language that defines a discourse, and a difference in it is not a violation, but perhaps a manifestation of post-Romantic sentiments.

Scientific discourse also sets its own standards without changing established traditions Li & Zhu (2022). Literature, unlike other discourses, tends to play with its own norms, problematising and changing them. This allows us to identify authorial styles and even styles of creativity (Martin, 2022). Thus, the writer seems to create his or her own language or specifies the possibilities of language in each of his or her works.

During the last century, in Ukrainian philology, structuralism facilitated an encounter between literary studies and cultural studies (Dmytrenko et al., 2024; Kozlova & Polyezhayev, 2022). Linguistic and literary studies circles were created that called for the analysis of poetics and language in literature. This approach allowed for a more detailed study of the works of Ukrainian classics, revealing new aspects of their creative heritage. Structuralism also helped to understand the deep connections between language and culture, revealing certain universal patterns in the functioning of the literary system. All of this contributed to the development of Ukrainian philology and enriched its theoretical framework.

However, with the establishment of Soviet rule, the term “formalism” became a tool for discrediting and subordinating cultural theories to the political order (Skrypyk et al., 2024; Abdulmughni, 2019). This led to a conflict between literary theorists and political figures. Structuralism was criticised for political reasons, which spurred the development of new theories in the field of literary studies.

From that time onwards, various aspects of culture, language and literature were viewed through the prism of social and political theories. This has allowed for the development of a broader and more interdisciplinary approach to the study of the humanities, based on the interaction of different disciplines, approaches to textual analysis, and levels of interdisciplinarity. The first level can be called “multidisciplinary” when information from different sciences or fields is used without changing or enriching these disciplines. At the second level, cooperation between different disciplines or sectors of the same science leads to interaction and mutual exchange of knowledge. Finally, at the stage of interdisciplinary linkages, we can expect success at the highest level, where collaboration is seen as a general system without stable boundaries between disciplines.



Methodology

This study used the systematic literature review (SLR) method, which allowed for a rigorous and systematic approach to identifying, analysing and synthesising relevant literature. This enabled valid and reliable conclusions to be drawn from a thorough review of existing research. Another explanation of SLR defines it as a systematic method of searching for and critically reviewing different studies on a particular issue, followed by integrating the results to provide a detailed picture of the research subject. In this study, the SLR approach was used to systematise the available research on the concept of interdisciplinarity in the study of Ukrainian philology and to identify the problems of the intersection of linguistics and literary studies in contemporary research. This study used the systematic literature review (SLR) methodology proposed by Xiao & Watson (2019). The research methodology included the development of a research protocol to study the problem of interdisciplinarity in Ukrainian philology and the intersection between linguistics and literary studies. The main research questions were to study the current state of scientific research on interdisciplinarity in Ukrainian philology and to identify the factors that contribute to the synergy between linguistics and literary studies in the light of world scientific practice.

The inclusion criteria included limiting the date of publication to 2019 to 2024, the languages of publication (Ukrainian and English), the obligatory mention of the terms “Interdisciplinarity, Linguistics, Literary Studies” in the title, abstract or keywords, as well as the availability of full texts and publication in peer-reviewed journals or conferences. Google Scholar, Frontiers, ResearchGate and Scopus databases were used for the search. The quality assessment included removing duplicate publications and checking whether the findings were relevant to the research objective. It was also important that the research objectives were clear, the methodology was repeatable and appropriate to the tasks.

However, it is worth noting some other limitations of the work. Restricting the search to English-language articles published in the last five years may result in missing important information that may be presented in articles in Ukrainian or published more than five years ago. It is also important to bear in mind that an interdisciplinary approach may require a broader knowledge base, which may be difficult to achieve in a single article or study. Therefore, to obtain a more complete research, it is important to consider different sources and approaches to the study of this issue.

Results and discussion

Ukrainian philology is a science that studies the Ukrainian language and literature. It combines two interdisciplinary fields of knowledge - linguistics and literary studies - which interact with each other in the process of studying various aspects of Ukrainian culture. Since the founding of university philology departments, both fields have been considered in the context of unity and interaction. Language and literature are inextricably linked, and the study of one field of knowledge is impossible without taking into account the other. These two fields not only complement each other, but also create a unique synergistic effect that contributes to a deeper understanding of Ukrainian culture and identity.

An interdisciplinary approach to the study of Ukrainian philology allows us to explore it as a complex phenomenon that includes various aspects - from language structures to literary works, from history to contemporary trends. This approach allows us to get a more complete picture of Ukrainian culture and promotes the development of new research methods.

Modern research in the field of Ukrainian philology increasingly favours an interdisciplinary approach, as it allows scholars to pay attention to various aspects of language and literature and to consider them in a comprehensive manner. Such an overview helps to identify new connections and interactions between different fields of knowledge and helps to improve and develop the study of Ukrainian philology.

Thus, interdisciplinarity in the study of Ukrainian philology opens up new opportunities for research and development of this field. It allows researchers to study the Ukrainian language and literature in depth,



as well as to consider them in the context of general cultural, historical and social processes. Such an approach contributes to a more complete understanding of Ukrainian culture and heritage and promotes the development of national philology.

In addressing working question 1, it should be noted that interdisciplinarity in the study of Ukrainian philology is a very important topic, as the combination of linguistics and literary studies allows us to get a more complete picture of the Ukrainian language, literature, culture and history. Ukrainian sources explore this topic from different perspectives. Some of them focus on analysing texts of Ukrainian literature from a linguistic point of view, exploring the linguistic features of writers and their influence on the literary process. Other sources explore the relationship between language and national identity, examining what information language can give us about the Ukrainian people.

Another important aspect is the study of the interaction between the Ukrainian language and culture, which allows us to better understand the specifics of the Ukrainian language and its impact on the development of Ukrainian culture. In general, the ten selected scholarly works by Ukrainian authors confirm that interdisciplinarity in the study of Ukrainian philology opens up new opportunities for the study of the Ukrainian language and literature and broadens our understanding of Ukrainian culture and history.

Table 1.
A systematic review of the Ukrainian literature

Number	Authors, year of publication	Research problems
1	Yuhan, N., Osipchuk H., Siroshstan, T., Prykhodko, V., & Mytiay, Z. (2024)	They study the problems of synergy between philological disciplines and the vectors that combine linguistics and literary studies in the context of modern science.
2	Dmytrenko, V., Khairulina, N., Brovko, O., Kryzhanovska, O., & Perepadia, D. (2024)	They analyse the intercultural discourse of the philological sciences, highlighting the latest approaches of interdisciplinarity.
3	Komisar, L., Savolainen, I., Belia, V., Borovska, L., & Lipin, M. (2024)	They are immersed in metadisciplinarity at the intersection of modern philological and philosophical science.
4	Hamaniuk, V. A., & Karpiuk, V. A. (2023)	They study new trends in Ukrainian linguistics, literature and language.
5	Shykyrynska, O. (2022)	They study the boundaries of interdisciplinarity in a historical context.
6	Popova, O., Grushevskaya, E., Zelenskaya, V., Golubtsov, S., & Grushevskaya, T. (2019, DECEMBER)	They examine language, culture and society at the intersection of modern scientific disciplines.
7	Ramadanovic, P. (2021)	He considers interdisciplinarity as the future of the literary and humanities sciences.
8	Skrypnyk, A., Lytvyn, N., Kholod, I., Didenko, N., & Ivashchuk, A. (2024)	They study linguistic imagology as an interdisciplinary linguistic and literary approach.
9	Torchynska, N., Shymanska, V., Gontsa, I., & Dudenko, O. (2021)	They see intertextuality as a formative component of contemporary Ukrainian discourse.
10	Klymenko, O., & Yenikeyeva, S. (2022)	They explore the synergy between linguistics and other sciences as a new linguistic philosophical paradigm.

Source: authors' own development.

A systematic analysis of the national literature has shown that Ukrainian literary studies and linguistics are interconnected. Both disciplines rely heavily on common theoretical principles that influence the understanding of language. The dualism of forms and meanings can hinder cooperation between linguistics and literary studies. The grammatical tradition sometimes favours semantics and sometimes expression, giving rise to the problem of one-sidedness. It is important to reject dualistic views and consider the relationship between content and form as a unity of different aspects. After all, form and meaning are interconnected and interdependent, and only by considering them as a whole can we achieve a complete understanding of the text. Linguistics and literary studies must work together, taking



into account both the grammatical and semantic aspects of language, to study and interpret texts in their full context. Only then can a deeper understanding and analysis of linguistic and literary texts be achieved.

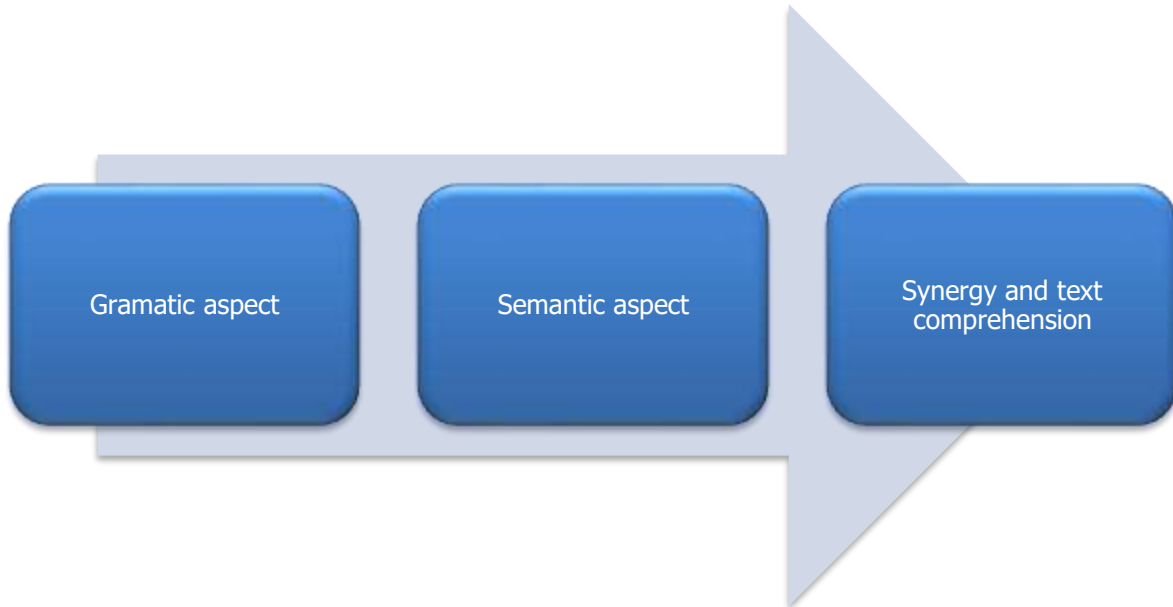


Figure 1. Interdisciplinarity between linguistics and literary studies at the level of form and meaning. Source: authors' own development.

In the context of Working Paper 2, we note that the main problem of the relationship between linguistics and literary studies remains the issue of semiosis, the unpredictable combination between expression and meaning, which suggests that signs are not given but constructed in both expression and interpretation. In a related study, Mizumoto (2023) argues that literature, through its reflexive approach, can critique semiosis through creative techniques such as repetition, rhyme, non-standardisation, juxtaposition, and the creation of new signs. This critique goes beyond the traditional understanding of language as a system of words bound by rules.

In the light of the problem of interdisciplinarity in the philological sciences, Dwight (2022) asks how one can work with missing or vague words, different connections and local norms. According to the author, if interdisciplinarity is an advantage of understanding. Literature does not follow grammar; it experiments with it. We should shade our theoretical ideas about language through artistic freedom, which contributes to the creation of new forms and expressions. Literature and language arts use linguistic material to innovate and create new forms that reflect semiotic diversity, as in poetry, song and calligraphy.

This semiotic diversity should be reflected in the concept of language. Demiryay (2022) believes that semiotics should be thought of as an extension of linguistics and pay attention to the semiotic diversity in language: intonation, punctuation, morphemes, positions and nullification. Linguistics and literary studies have a wide range of common connections. The structuralist approach in comparative linguistics can be seen as an organ of the cultural sciences. Demirel & Korkut (2019) emphasise the importance of works and the concept of the work, resorting to psychological, philosophical or sociological approaches.

According to Coombe et al., (2020), languages and works are interconnected: languages are embodied in works, which are in turn remade, which emphasises the constant genesis of signs and languages. The genesis of language is perpetuated in forms of language, which are seen as a heritage that is passed down from generation to generation through oral and written texts. Languages are works from which we

create other works, conscious of their exemplarity. In their work, Coman & Selejan (2019) considered whether linguistics belongs to the natural or historical sciences. However, it should be noted here that it does not belong to any of them, but to a branch of science that, if it exists, should be called semiology.

According to Chapman & Routledge (2009), the semiological system “language” is the most important system that humanity has encountered in its existence. It has emerged not only as a result of agreement between neighbours, but also through the transmission of knowledge from parents to children through imperative tradition. This system is constantly in the presence of time and is dynamic, making it unexperienced and unknown in its entirety. Thus, languages are to a large extent the result of literature. Major works synthesise and offer a standard not only aesthetic but also grammatical. They reflect lexicon, grammar and text - the three main tools of a linguist (Carter & Stockwell, 2020; Baker, 2022).

Works continue cosmogenesis, creating and multiplying worlds. If literary studies were to separate from linguistics, it would put them in a situation similar to that of musicology without acoustics and organology, or even philosophy of nature, which would neglect everything to do with physics and biology. The scientific basis of literary studies reflects the important interplay between language, text, culture and history, which helps us to better understand the essence of works of literature and their impact on society and individuals.

According to a study by Brandist (2022), interest in linguistics has now deepened as it has become a complex scientific field that combines various micro-disciplines. For the successful development of modern linguistics, it is important to have ambitions aimed at solving the key problems of the field, as well as to take responsibility for creating innovative approaches and research methods.

In order to achieve the goals of modern linguistics, it is necessary to accept the challenges faced by literary science. For example, one of the most important tasks is to develop new methods of analysing and interpreting linguistic data that would allow us to avoid static and outdated approaches to research. In addition, it is necessary to improve cooperation between linguists and representatives of other humanities to ensure an interdisciplinary approach to the study of language and its role in society. International exchange of knowledge and experience in the field of linguistics should also be actively promoted to enrich the scientific dialogue and contribute to the formation of a global community of linguists.

Boleda's (2020) study emphasises that philological challenges are even more significant because texts (both oral and written) are the object of linguistics (individual words or sentences are only artefacts) as well as the object of its study. Philology reminds us that there are no trifles, every detail has its own significance. With the help of philological methods, linguistics has included spoken language, and the development of corpus linguistics has led to the creation of digital philology. The question of polysemy raised by the century indicates that the dictionary does not always reflect the meaning of words correctly, since language is not just a set of fixed signs. Semiosis is not encoded in the language system. If language tries or even enforces conventions, this is always necessary, but it may not be enough to achieve semiosis - the constantly renewed and unpredictable meaning of signs in context, with the understanding that the context extends to the text and even to all materials.

In this context, according to Ardelean (2019), the so-called “formal” elements of poetry, such as rhyme, meter, verse and stanza, are tools for shaping semiotic innovations. This applies to all literature with its limitations - and all literature becomes creative within the ethical and aesthetic constraints it imposes on itself. The main quality of a writer is not just imagination or a romantic substitution of old inspiration, but the ability to use the smallest elements of linguistic material to create always renewed and unpredictable forms.

Literary experiments are an important component of the development of modern literature and have great potential for use in research and the expansion of semiotic understanding. The interdisciplinary approach in the philological sciences allows us to deepen our understanding of language and its role in society. By



considering the interaction of different disciplines, it is possible to broaden and relativise our understanding of language, to avoid nationalistic restrictions and standardisation of language. Languages constantly interact with each other, and the phenomena of language diffusion play an important role in the development of language systems. Working with texts, regardless of their origin or original language, contributes to the renewal and development of linguistic expression. Thus, literary and linguistic research based on an interdisciplinary approach can help us better understand semiosis, broaden our understanding of language and contribute to its further development in modern society.

Conclusions

Thus, in answering the first research question, it was found that in the modern world, the study of synergy between philological disciplines that combine linguistics and literary studies is of great importance. In Ukrainian philological research on interdisciplinarity, the emphasis is placed on the intercultural discourse of philological sciences, which highlights new approaches to interdisciplinarity. Meta-disciplinarity at the intersection of philological and philosophical sciences is seen as an essential aspect of the development of the humanities. New trends in Ukrainian linguistics and literature are studied in the historical context, which allows us to understand the limits of interdisciplinarity in these fields. The consideration of language, culture and society through the prism of modern scientific disciplines makes it possible to analyse in depth their interconnection and influence on the contemporary socio-cultural environment. Interdisciplinarity is seen as a key factor in the future development of literary and humanitarian sciences, and linguistic imagology is recognised as an effective linguistic and literary approach. Intertextuality is seen as a component of contemporary Ukrainian discourse, and the synergy between linguistics and other sciences is considered a new linguistic philosophical paradigm.

In the light of the second question, about the world scientific thought on interdisciplinarity, interdisciplinarity in the philological sciences contributes to the discovery of new patterns and continuous changes in language and literature, which may be important for the further development of the humanities. The study of the formation, evolution and decay of canonical forms allows us to better understand the essence of language and literature as complex cultural phenomena. The main issue of rational objectification and science in the field of literary studies remains relevant. Probabilistic models of corpus linguistics are increasingly used in conjunction with connectionist systems to identify new observations, develop metrics of uniqueness and criticism of the decisions made. These models require a subtle analysis of important indicators that can identify and enhance "sensitivity" to literary texts. Nevertheless, research programmes that address these issues remain essential to overcome hesitancy in the study of literature.

In the future research of Ukrainian philology, interdisciplinarity will become an important area, which involves combining knowledge and methods from different fields of science. Especially relevant will be the intersection of linguistics and literary studies, which will allow us to consider the text as a complex system where linguistic and literary phenomena interact with each other. It would be advisable to study the relationship between the linguistic and literary structures of texts, analyse the use of linguistic means in the works of writers, and study the influence of language on the structure and content of texts. This approach would allow for a deeper understanding and explanation of textual phenomena, as well as the identification of new connections and patterns in the study of the Ukrainian language and literature. The interdisciplinary approach will also allow us to involve new methods and approaches that may be important for the development of science. The possible combination of linguistic and literary data will allow us to create more complete and comprehensive models for text analysis, as well as to reveal new aspects of the study of Ukrainian philology. Thus, the interdisciplinary study of Ukrainian philology, which combines linguistics and literary studies, has great potential for discovering new knowledge and solving current scientific problems.



Bibliographic References

- Abdulmughni, S.A.A. (2019). Stylistics, literary criticism, linguistics, and discourse analysis. *International Journal of English Linguistics*, 9(2), 412. <https://api.semanticscholar.org/CorpusID:171553637>
- Alic, L. (2020). Culturemes, agentivity, contyastivity. *Redefining Community in Intercultural Context*, 9(1), 81-86. <https://www.ceeol.com/search/article-detail?id=874356>
- Aliyeva, G.B. (2023). Text linguistics and the use of linguistic data in modern technologies: Prospects for development. *Future of Social Sciences*, 1(2), 18-29. <https://doi.org/10.57125/FS.2023.06.20.02>
- Aliyeva, G. B., Honcharuk, V., Pavliuk, N., Zinchenko, V., & Sivachenko, I. (2023). Revisão das tecnologias e métodos pedagógicos modernos no domínio da filologia de acordo com as normas Europeias (revisão de literatura). *Revista on line de Política e Gestão Educacional, Araraquara*, 27(esp. 2), e023049. <https://doi.org/10.22633/rpge.v27iesp.2.18778>.
- Ardelean, C. (2019). Relevance of the cultural transfer in translation: False friends in media sources. *Scientific Bulletin of the Politehnica University of Timisoara, Transactions on Modern Languages*, 1, 18. <http://www.sc.upt.ro/attachments/article/298/07%20Ardelean.pdf>
- Baker, W. (2022). From intercultural to transcultural communication. *Language and Intercultural Communication*, 22(3), 280-293. <https://doi.org/10.1080/14708477.2021.2001477>
- Bakhmat, N., Krasnoshchok, I., & Voron, O. (2023). International experience of using e-learning during pandemics and military conflicts. *E-Learning Innovations Journal*, 1(2), 68-85. <https://doi.org/10.57125/ELIJ.2023.06.25.04>
- Bizzoni, Yu., Degaetano-Ortlieb, S., Fankhauser, P. & Teich, E. (2020). Linguistic variation and change in 250 years of English scientific writing: A data-driven approach. *Frontiers in Artificial Intelligence*, 3, 73. <https://doi.org/10.3389/frai.2020.00073>
- Boleda, G. (2020). Distributional semantics and linguistic theory. *Annual Review of Linguistics*, 6, 213-234, 2020. <https://doi.org/10.1146/annurev-linguistics-011619-030303>
- Borysenko, O., Marukhovska-Kartunova, O., Volkova, V., Baran, A., & Maraieva, U. (2024). The influence of social networks on the formation of modern culture and its relationship with philosophy. *Future Philosophy*, 3(3), 80-94. <https://doi.org/10.57125/FP.2024.09.30.05>
- Brandist, C. (2022). From literary theory to cultural studies. In *Central and Eastern European Literary Theory and the West*. De Gruyter. <https://doi.org/10.1515/9783110400304-042>
- Carter, R., & Stockwell, P. (2020). *The language and literature reader*. Routledge. <https://doi.org/10.4324/9781003060789>
- Chapman, S., & Routledge, C. (2009). *Key ideas in linguistics and the philosophy of language*. Edinburgh University Press. <https://doi.org/10.1515/9780748631421>
- Coman, D., & Selejan, C. (2019). The Limits of (Un)translatability: Culturemes in Translation Practice. *Transylvanian Review*, 28. <https://acortar.link/fBydlo>
- Coombe, C., Vafadar, H., & Mohebbi, H. (2020). Language assessment literacy: What do we need to learn, unlearn, and relearn? *Language Testing in Asia*, 10(1), 1-16. <https://link.springer.com/article/10.1186/s40468-020-00101-6>
- Demirel, H.H., & Korkut, U.I. (2019). Cross-cultural transfer in translation: translator preferences in translating cultural elements from Turkish to English in Madonna in a fur coat by Sabahattin Ali. *International Journal of Educational Technology and Learning*, 5(1), 1-8. <https://doi.org/10.20448/2003.51.1.8>
- Demiryay, N. (2022). Literary translation as a form of conveying cultural aspects (an approach to translatability from German into Turkish). *Synesis*, 14(2), 383-395. <https://seer.ucp.br/seer/index.php/synesis/article/view/2337>
- Dmytrenko, V., Khairulina, N., Brovko, O., Kryzhanovska, O., & Perepadia, D. (2024). Cross-cultural discourse of philological studies: The advanced approaches. *Multidisciplinary Reviews*, 7, 2024spe020. <https://doi.org/10.31893/multirev.2024spe020>
- Dwight, B.W. (2022). *Modern Philology*. BoD-Books on Demand. <https://acortar.link/pR9nVI>
- Frumkina, A.L., Diachenko, M.D., Poliezhaiev, Yu.H. Savina, N.B., & Hadi, F. (2020). Readiness of future teachers for integrated teaching of educational subjects in foreign language. *Práxis Educacional, Vitória da Conquista*, 16(38), 502-514. <https://periodicos2.uesb.br/index.php/praxis/article/view/6023>



- Frye, N. (2020). *Anatomy of criticism: Four essays*. Vol. 70. Princeton University Press. <https://acortar.link/Jr2sVZ>
- Grebennikova, V., Bonkalo, T., Rudenko, E., Us, O., & Malkov, A. (2023). Spiritual and moral sovereignty of personality in information society: A subjective environmental approach. *Synesis*, 15(4), 100-112. <https://seer.ucp.br/seer/index.php/synesis/article/view/2722>
- Greenwood, E. (2022). Introduction: Classical philology, otherhow. *American Journal of Philology*, 143(2), 187-197. <https://doi.org/10.1353/ajp.2022.0012>
- Hamaniuk, V.A., & Karpiuk, V. (2023). 2nd International Conference on New Trends in Linguistics, Literature and Language Education. *ACNS Conference Series: Social Sciences and Humanities*, 3, 01001 <https://elibrary.kdpu.edu.ua/handle/123456789/7403>
- Helle, S. (2022). What Is philology? From crises of reading to comparative reflections. *Poetics Today*, 43(4), 611-637. <https://doi.org/10.1215/03335372-10017681>
- Hong Van, Vu. (2022). Education patriotism from education of traditional cultural values. *Synesis*, 14(2), 119-134. <https://seer.ucp.br/seer/index.php/synesis/article/view/2196>
- Imola, N. (2024). From realia to culturemes. The problem of culture-bound words in translation. The dialogue of multicultural discourses. *Synesis*, 16(1), 569-585. https://ibn.idsi.md/sites/default/files/imag_file/LDMD-08%20Lite_2020.pdf#page=569
- Jalilbayli, O.B. (2022). Philosophy of linguistic culture and new perspectives in modern Azerbaijani linguistics. *Future Philosophy*, 1(4), 53-65. <https://doi.org/10.57125/FP.2022.12.30.05>
- Jameson, F. (2020). *The prison-house of language: A critical account of structuralism and Russian formalism*. New Jersey: Princeton University Press. <https://www.torrossa.com/en/resources/an/5580002>
- Jauss, H.R. (2022). *Literary history as a challenge to literary theory*. In *New directions in literary history*, pp. 11-41. Routledge. <https://doi.org/10.2307/468585>
- Klassen, N. (2022). *Rationality Is... The Essence of Literary Theory*. Wipf and Stock Publishers. <https://philpapers.org/rec/KLARIT>
- Klymenko, O., & Yenikeyeva, S. (2022). Synergetic linguistics as a new philosophy of language studies. *Theory and Practice in Language Studies*, 12(2), 417-423. <https://doi.org/10.17507/tpls.1202.28>
- Komisar, L., Savolainen, I., Belia, V., Borovska, L., & Lipin, M. (2024). Metadisciplinarity at the intersection of modern philosophical and philological practices. *Amazonia Investiga*, 13(75), 211-220. <https://doi.org/10.34069/AI/2024.75.03.18>
- Kozlova, T., & Polyezhayev, Yu. (2022). A cognitive-pragmatic study of Australian English phraseology. *Ad Alta: Journal of Interdisciplinary Research*, 12(1). <https://doi.org/10.33543/12018593>
- Lanza, D., & Ugolini, G. (2022). *History of classical philology: from Bentley to the 20th century*, Vol. 2. Walter de Gruyter GmbH & Co KG. <https://doi.org/10.1515/9783110730388>
- Li, J., & Zhu, X. (2022). A bibliometric study of the research field of experimental philosophy of language. *Forum for Linguistic Studies*, 4(1), 18-35. <https://philpapers.org/rec/LIABSD-2>
- Martin, M.R. (2022). *Psychoanalysis and literary theory: an introduction*. Taylor & Francis. <https://doi.org/10.4324/9781003219347>
- Metu, I.C., Agu, N.N., & Eleje, L.I. (2024). Students' perceptions of and preferences for assessment feedback in higher education: Implication for evaluators. *Future of Social Sciences*, 2(2), 21-37. <https://doi.org/10.57125/FS.2024.06.20.02>
- Mizumoto, M. (2023). Experimental philosophy and ordinary language philosophy. In *Experimental Philosophy of Language: Perspectives, Methods, and Prospects* (pp. 31-56). Cham: Springer International Publishing. https://link.springer.com/chapter/10.1007/978-3-031-28908-8_3
- Mühlebach, D. (2022). Non-ideal philosophy of language. *Inquiry*, 1-23. <https://doi.org/10.1080/0020174X.2022.2074884>
- Paulson, W. (2019). *The noise of culture: Literary texts in a world of information*. Cornell University Press. <https://www.jstor.org/stable/10.7591/j.ctvv4160g>
- Popova, O., Grushevskaya, E., Zelenskaya, V., Golubtsov, S., & Grushevskaya, T. (2019). Language, culture, society at the intersection of modern scientific disciplines. In *International Conference on Man-Power-Law-Governance: Interdisciplinary Approaches (MPLG-IA 2019)*. Atlantis Press. <https://doi.org/10.2991/mplg-ia-19.2019.12>



- Pountain, Ch.J. (2019). Modern languages as an academic discipline: the linguistic component. *Language, Culture and Curriculum*, 32(3), 244-260. <https://doi.org/10.1080/07908318.2019.1661153>
- Prasad, K., & Vaidya, R. (2023). The application of learning analytics to support the students in higher education. *Synesis*, 15(1), 183-194. <https://seer.ucp.br/seer/index.php/synesis/article/view/2441>
- Ramadanovic, P. (2021). *Interdiscipline: a future for literary studies and the humanities*. Routledge. <https://doi.org/10.4324/9781003119616>
- Redko, K., Riznyk, D., Nikolaiev, S., Yatsenko, O., & Shuplat, O. (2024). The role of investment in creating a sustainable financial future: strategies and tools. *Future Economics & Law*, 4(3), 20-33. <https://doi.org/10.57125/FEL.2024.09.25.02>
- Shykyrynska, O. (2022). Areas of interdisciplinary studies in historical context. *Journal of Danubian Studies and Research*, 12(2). <https://dj.univ-danubius.ro/index.php/JDSR/article/view/1862>
- Skrypnyk, A., Lytvyn, N., Kholod, I., Didenko, N., & Ivashchuk, A. (2024). Linguistic imagology as a new approach to the analysis of linguistic images: methods and theoretical aspects. *Amazonia Investiga* 13(73), 220-230. <https://doi.org/10.34069/AI/2024.73.01.18>
- Torchynska, N., Shymanska, V., Gontsa, I., & Dudenko, O. (2021). Intertextuality as an integral component of the modern Ukrainian discourse (on the example of literary and journalistic styles). *Postmodern Openings*, 12(4), 255-271. <https://doi.org/10.18662/po/12.4/373>
- Xiao, Yu., & Watson, M. (2019). Guidance on conducting a systematic literature review. *Journal of Planning Education and Research*, 39(1), 93-112. <https://doi.org/10.1177/0739456X17723971>
- Yuhan, N., Osipchuk H., Siroshstan, T., Prykhodko, V., & Mytiay, Z. (2024). Synergy of philological disciplines: combining the vectors of linguistics and literary studies in the context of modern science. *Synesis*, 16(2), 19-32. <https://seer.ucp.br/seer/index.php/synesis/article/view/3030>



DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.20>


Cómo citar:

Dumchak, I., Kachmar, O., Mochalova, N., Oleksandrenko, K., & Sidorova, I. (2024). Socio-cultural factors influencing students' learning experience: a cross-cultural study. *Revista Eduweb*, 18(3), 264-275. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.20>

Socio-cultural factors influencing students' learning experience: a cross-cultural study


Factores socioculturales que influyen en la experiencia de aprendizaje de los estudiantes: un estudio transcultural

Iryna Dumchak

 <https://orcid.org/0000-0002-3491-6960>
dumcira2018@gmail.com


CSc., Assistant Professor, Language Centre of the Faculty of Arts, Jan Evangelista Purkyně University in Ústí nad Labem, Ústí nad Labem, Czech Republic.

Oleksandra Kachmar

 <https://orcid.org/0000-0002-2002-4603>
oleksandra75@ukr.net


Doctor of Philosophical Science, Professor, Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine.

Nataliia Mochalova

 <https://orcid.org/0000-0001-6178-6287>
liuthien.berenlove@gmail.com


Senior Instructor, Applied Linguistics Department, National University of Shipbuilding after Admiral Makarov, Mykolaiv, Ukraine.

Kateryna Oleksandrenko

 <https://orcid.org/0000-0001-9735-3715>
oleksandrenkok@gmail.com

Doctor of Psychological Sciences, Professor, Chief of Department of Foreign Languages, Faculty of International Relations and Law, Khmelnytskyi National University, Khmelnytskyi, Ukraine.

Iryna Sidorova

 <https://orcid.org/0000-0002-9212-1701>
sidorovairuna1978@gmail.com

PhD., in Pedagogical Sciences, Associate Professor, Associate Professor of the Department of Vocal and Choral Training, Theory and Methods of Music Education named after V. Gazinsky, Faculty of Arts and Art-Educational Technologies, Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University, Vinnytsia, Ukraine.

Recibido: 16/08/24

Aceptado: 29/09/24

Abstract

The modern globalized educational sphere requires well-established skills to work in a cross-cultural environment. The purpose is the study of socio-cultural factors that affect the educational experience of students. To implement the proposed goal, the PRISMA method of working with scientific sources, the method of content analysis of scientific literature, and the method of synthesizing individual results into a single system were used. In the results, it was noted that the effective formation of the sociocultural educational environment in higher education consists of several complex parts. The positive consequence



of the formation of a socio-cultural environment undoubtedly creates an atmosphere for the success of education seekers and the harmonization of cross-cultural relations. It is indicated that there are separate risks that appear because of the complex interaction of all participants in the educational process. The study found that in modern universities there are many successful cross-cultural cases that contribute to the integration of different students: mobility programs, summer schools, scientific conferences, distance learning courses etc. The conclusions emphasize that the unification of students in a unique multicultural educational environment is a necessary part of the modern educational process in institutions of higher education.

Keywords: cultural differences, social influences, educational strategies, intercultural communication, university education, statistics, foreigners.

Resumen

La esfera educativa globalizada moderna requiere habilidades bien establecidas para trabajar en un entorno intercultural. El objetivo es el estudio de los factores socioculturales que afectan la experiencia educativa de los estudiantes. Para implementar el objetivo propuesto, se utilizaron el método PRISMA de trabajo con fuentes científicas, el método de análisis de contenido de la literatura científica y el método de síntesis de resultados individuales en un solo sistema. En los resultados, se observó que la formación efectiva del entorno educativo sociocultural en la educación superior consta de una serie de partes complejas. La consecuencia positiva de la formación de un entorno sociocultural crea sin duda una atmósfera para el éxito de los solicitantes de educación y la armonización de las relaciones interculturales. Se indica que existen riesgos separados que aparecen como resultado de la interacción compleja de todos los participantes en el proceso educativo. El estudio ha demostrado que en las universidades modernas existen numerosos casos exitosos de integración intercultural que contribuyen a la integración de diferentes estudiantes: programas de movilidad, escuelas de verano, congresos científicos, cursos a distancia, etc. Las conclusiones destacan que la unificación de los estudiantes en un entorno educativo multicultural único es una parte necesaria del proceso educativo moderno en las instituciones de educación superior.

Palabras clave: diferencias culturales, influencias sociales, estrategias educativas, comunicación intercultural, educación universitaria, estadísticas, extranjeros.

Introduction

Given the trends in higher education, multiculturalism is becoming more prominent. This is due to the fact that modern students choose where to study and the availability of various mobility programs. Thus, students from different social status, religion, and culture meet in the same learning space. For this reason, new opportunities for learning are opening up. However, contemporary scholars also emphasize the emergence of various difficulties for both students and teachers (Yerken & Nguyen Luu, 2022). Various socio-cultural factors play a significant role in the system of forming innovative learning spaces for students (Yerken et al., 2022). They also affect their performance, motivation, and social integration in such an educational environment.

The cross-cultural study of this relevant and complex issue will also allow us to understand the impact of basic cultural differences, language barriers, family and social values that can facilitate or complicate the modern process of acquiring knowledge and skills. In particular, the scientific literature has identified that students from collectivist cultures may in some cases feel uncomfortable in individualistic learning environments (Halimi et al., 2020). This problem can also be inherent in students who pay attention to individual results, especially when group work is implemented. Therefore, identifying and understanding the main socio-cultural factors is an important basis for creating an inclusive and effective learning environment that can take into account the key needs of all participants in the learning process in the future. Therefore, the purpose of this study is to analyze the main social and cultural factors that influence the



organization of the learning space and the formation of students' learning experience. The main research objectives are as follows:

1. To analyze the state of the scientific base on the peculiarities of the development of socio-cultural components of the modern learning space.
2. To formulate the main socio-cultural factors that influence the formation of an inclusive learning environment.
3. To identify the main barriers in a multicultural learning environment and formulate separate recommendation solutions to overcome them.

Literature review

The study of socio-cultural factors and their impact on the educational experience of modern students has certain results reflected in the scientific literature. Researchers have paid attention to both individual aspects of this issue and conducted comprehensive reviews aimed at highlighting general trends in the development of students in the modern cross-cultural environment. In particular, Al-Busaidi (2019) pointed out the peculiarities of adaptation of students in the environment of Arab universities, although he only briefly noted the existence of similar problems for Arabs studying outside the Arab countries. Ester (2022) identified the general features of teaching mathematics in a multicultural environment of university education, pointed out the existing problems of adaptation of talented students in a foreign environment (on the example of Israel and Finland).

Chao, Wu & Tsai (2021), based on Chinese experience and empirical data from several universities, identified the positive role of distance education and the use of digital technologies in modern education: thanks to distance learning, students have less contact with each other, so the cultural difference between them is not a serious need. The complex problems of adaptation in adult life, the stage of transition from school to university life, were considered by Fute, Oubibi & Kangwa (2024). Similarly, Levchenko et al. (2022) emphasized certain difficulties in the adaptation of young people's psychology. In general, researchers note the importance of additional factors such as communication skills, educational environment, teaching skills of teachers, and student environment. Obviously, these factors are important for socio-cultural interaction in the modern multicultural environment of students.

Among the individual issues that have received research attention is the issue of cultural communication in the team (Sydorenko, 2024). The researchers also analyzed the topic of migrants and their participation in educational processes, concluding that a significant percentage of foreign students in higher education institutions are migrants or descendants of migrants, so working with them will require additional attention (Kamardina et al., 2024).

Krasodomska & Godawska (2020) traced the integration of digital technologies into the educational process and identified some of the problems that emerged during this process. Similar views were shared by Yang & Lilit (2023), who noted the emergence of additional challenges associated with the acquisition of digital competencies as an indispensable attribute of modern distance learning in a multicultural team. Some studies focus on the specific problem of teaching Muslim women, which is extremely relevant for many countries (Harum et al., 2024; Orhani, 2023).

In fact, cultural barriers in education, as demonstrated in some studies, have a much deeper impact on the formation of educational environments, and overcoming them will require additional efforts and considerable time (Abdulai et al., 2021; Yevstakhevyh et al., 2021). The researchers' comments are valuable for pointing out specific difficulties and shortcomings in modern educational environments, as well as hypotheses for improving the situation in the education system. It is important to note that the cultural component in modern education is as important as logistics, teaching, or the use of digital technologies. Therefore, further research on this issue using specific cases that affect students' learning experiences is a relevant issue.



Methodology

Research design

The realization of the research objective is based on the use of a qualitative approach, which is conducive to the analysis and systematization of heterogeneous scientific publications on the subject. First of all, we are talking about such sources as scientific articles in problematic professional journals, some statistical information officially published on the Internet, chapters of collective monographs, monographic studies, abstracts of speeches at scientific conferences, collections of scientific conferences, etc. By combining information from different sources, we managed to achieve objectivity and impartiality in taking into account the opinions of researchers from many countries.

Data collection

The first step in writing the article was to find the necessary scientific information. To realize this stage, we searched among publications in the scientific and metric databases Scopus, Web of Science, and Google Scholar. The key markers for finding the necessary information were the following words: cultural differences, social influences, educational strategies, intercultural communication, university education, statistics, foreigners. At first, the search showed 1026 results. We immediately eliminated those scientific sources that were repeated. As a result, the volume of the analyzed literature decreased by 133 items.

The second stage was aimed at examining the sources obtained in detail - texts of scientific articles, tables of contents of monographs, abstracts of speeches at conferences, etc. Given the goals and objectives of the work, 198 search results were eliminated due to inconsistencies. The third stage of working with the literature involved setting a clear date range. First of all, the most relevant research papers published in 2019-2024 were selected. This made it possible to take into account the most relevant research, which would also take into account the existing experience of previous publications. This action resulted in the blocking of 506 scientific publications that had been published (or appeared online) before 2019.

The fourth stage was to apply additional criteria to the resulting list of references in order to specify the required studies among others that, although they were directed in a similar thematic direction, did not directly address the outlined topic. These markers were:

1. The study examines the socio-cultural factors that influence the learning experience of students.
2. The study describes the features of cross-cultural environments in modern universities.
3. The study, using the appropriate scientific basis, describes the difficulties and benefits of learning in cross-cultural environments, contains statistical calculations or other empirical data on this issue.

Taking into account criteria 1, 2, and 3, 30 research papers were retained for further processing. Another 3 papers were used by the authors in previous studies, so they meet the proposed search criteria. Another 3 papers were added as statistical papers for a better analysis of the research material (see Table 1).

Table 1.

Data Collection and Selection Process

Data Processing Stage	Number of Results
Initial Results	1026
Removal of Duplicates	-133
Removal of Irrelevant Studies	-198
Date Range Reduction	-506
Filtering by Criteria	
Criterion 1	-51
Criterion 2	-61
Criterion 3	-41



Number of Included Sources	30
Additional Sources	6
Total	36

Source: Authors' development

Data analysis

The data obtained were processed using the method of content analysis of scientific literature, which made it possible to highlight certain elements of scientific theories in comparison with the empirical research of other scientists. The method of synthesis was also applied, which consisted of combining the fragmentary data obtained into single conclusions based on the processing of scientific literature.

Results

The successful functioning of the socio-cultural educational environment in higher education is determined by a number of complex elements that reflect social, cultural, value and psychological components. In particular, cultural norms and values play an important role in this system, influencing how students perceive the phenomenon of education, interaction with the student environment and teachers (Häyrynen et al., 2021). These norms also affect their awareness of certain methodological approaches to learning (individual or teamwork). This system also emphasizes established family values. The family's attitude to education, level of support and expectations from the student can also affect their motivation and performance in acquiring knowledge (Fute et al., 2024).

In particular, in some cultures, gender roles play an important role in shaping their social space. This can affect how the role of women or men in society is perceived and their participation in education and knowledge in certain disciplines (technology, engineering, humanities, medicine, etc.). At the same time, religious beliefs can influence a student's choice of disciplines and perception of certain topics. For example, this is relevant when teaching ethics, evolution, etc.

On the other hand, social status and economic status can play a separate role in the formation of a socio-cultural learning environment. In particular, the scientific literature proves that the economic well-being of students can affect access to resources (computer, Internet) (Giovanis & Akdede, 2023). This, in turn, can affect the untimely receipt of educational materials and the difficulty of understanding certain subjects. However, perhaps the most important negative role in the system of interaction between all participants in the primary process may be played by stereotypes about ethnicity, gender, social origin, or nationality (Xiao, 2021). Such factors can additionally create certain discriminatory conditions that negatively affect the overall psychological comfort and academic performance of students (see Figure 1).



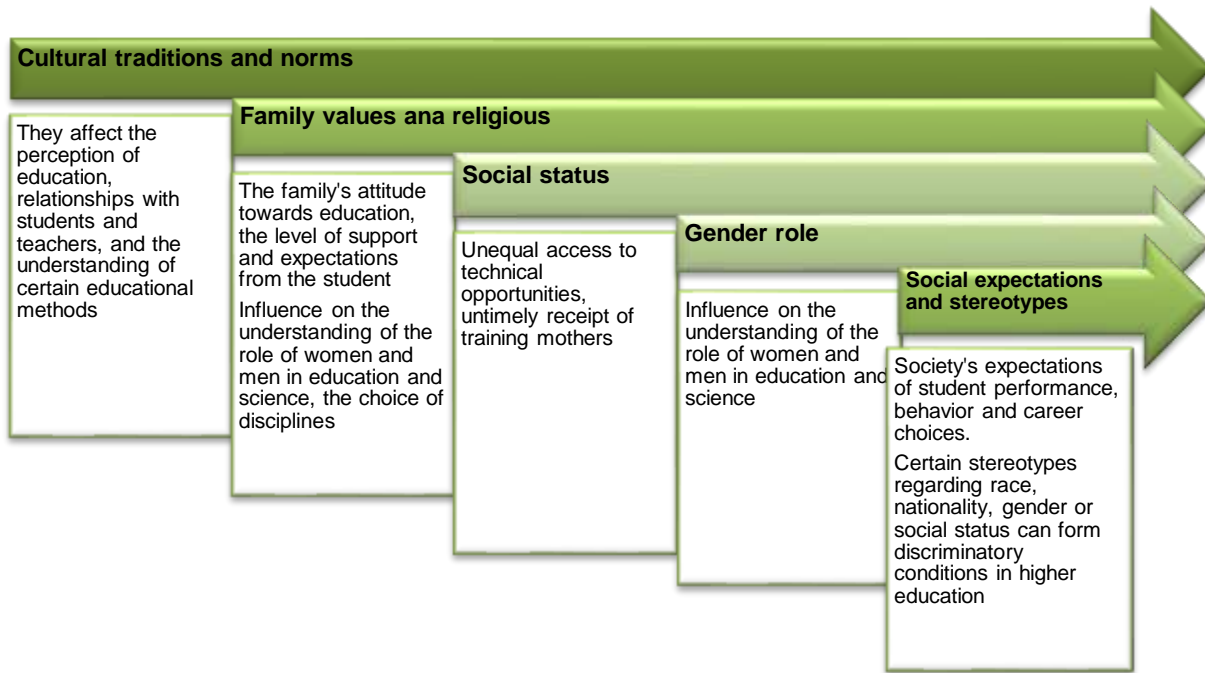


Figure 1. The main components of the formation of socio-cultural environment in higher education
Source: Authors' development

A positive result of the formation of the socio-cultural environment regulates the success of the formation of competencies among students related to their coexistence in a multicultural environment. Also, this process affects on harmonization of interethnic relations, prevention of xenophobia, and tolerance. As of 2022, 1.52 million students from abroad were studying at EU universities. In 2022, 376,400 international students studied in Germany (European Commission, 2022). They accounted for 25% of all international students studying in the EU. France was the next largest country in terms of the number of international students (17%). More than 44% of international students studying at tertiary level across the EU in 2022 were from other countries in Europe and Asia (25%) and Africa (17%) (European Commission, 2022) (See Figure 2).

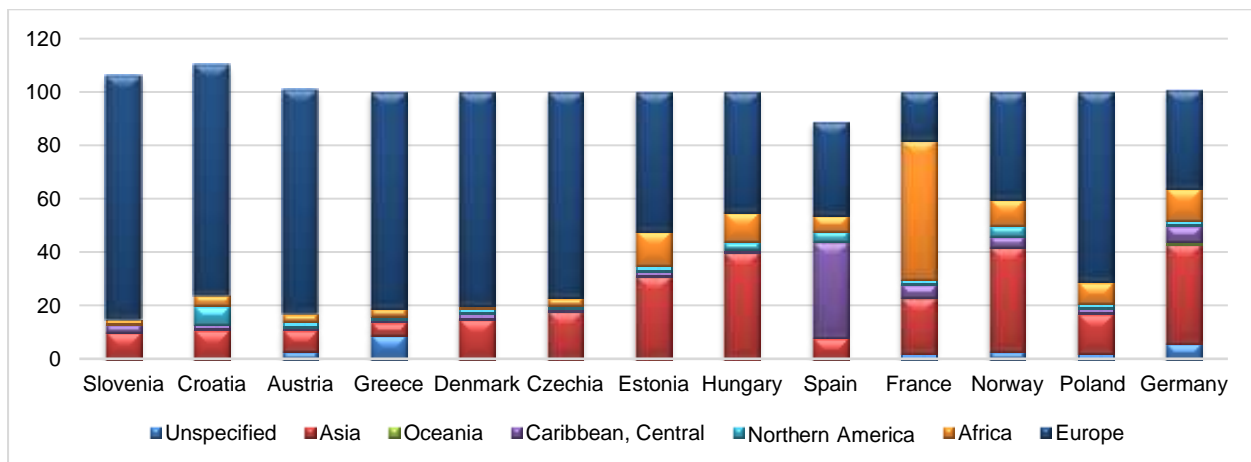


Figure 2. Distribution of international students in selected European countries
Source: European Commission (2022)



In 2023, the European Association for International Education (EAIE) published the results of an annual survey that showed the role of international students in the European Higher Education Area (EHEA). According to recent reports, more than half of participating universities (51%) said they received 2x more international applications for the 2023-2024 academic year than the year before (M Square Media, 2023). This shows that many more foreign students than in the past want to study in EU countries. In addition, almost half of the surveyed institutions (47%) believed that the number of international students increased in September 2023 compared to September 2022 (M Square Media, 2023). Thus, all this information indicates that EU universities are becoming more attractive to foreign students.

However, the complex dimension of the sociocultural environment is revealed in a complex system of relationships between all participants in education. Therefore, the content of these connections is key in the complex structure of education quality (Pichkur et al., 2023). Thus, the sociocultural educational environment can also influence the regeneration of certain challenges (Sari et al., 2024). Some of these risks, given their nature, can be socio-psychological, that is, determine situations of uncertainty in interpersonal relationships as a result of complex value disorientation (we are talking about psychological and identification changes). Socio-psychological risks can occur as a result of the complex interaction of all participants in the educational process, in particular in the format of student-student, teacher-student, teacher-teacher, etc.

Each type of these relationships is manifested in communication, which in some cases can lead to conflict situations (Vakhovskiy et al., 2022; Kim & Lee, 2023). It can be defined as a conscious or unconscious way of behavior of participants in the educational process in socio-cultural educational conditions (Klimek & Klimek, 2021). Also, both subjective and objective factors can be a source of risks to the formation of an effective socio-cultural environment of a higher education institution. Among the latter are the traditions of institution management: established rules and behavioral stereotypes, as well as the direct order of organization of the learning space system (Yılmaz & Temizkan, 2022; Bohomaz et al., 2023). Socioeconomic barriers also play a role. In particular, international students who come to study in European countries may face financial difficulties and limited access to educational resources. In addition, difficult adaptation to the high cost of living may also be evident (Giovanis & Akdede, 2023).

All of these factors can affect their social status in the country and affect their learning outcomes. The MSM report found that high living costs are the most pressing issue, with over 60% of respondents identifying it as a significant problem (M Square Media, 2023). International students from nations with lower income levels or depreciating currencies may find this difficult. As a result, some students can find it difficult to pay for necessities like housing, food, and transportation. For overseas students, obtaining a visa is an additional hurdle. According to the research, 54% of survey participants said that visa-related problems were either very tough or somewhat challenging. Specifically, the most often selected topic, according to 31% of respondents, was obtaining a visa (M Square Media, 2023). Students who want to study abroad may find this to be a major challenge because they have to deal with intricate administrative processes and criteria (See Figure 3).



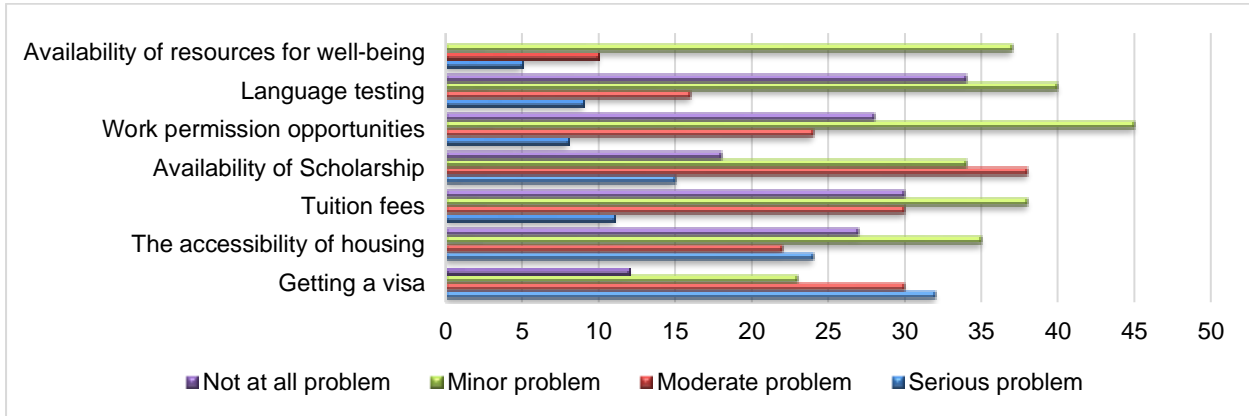


Figure 3. Problems faced by international students in European universities
Source: M Square Media (2023).

In a multicultural learning environment, language barriers may also arise. This can affect the level of engagement of the student in the learning process.

However, modern European universities demonstrate successful cross-cultural case studies. European universities offer foreign language training for students. In particular, in Luxembourg and France, most university students’ study two or more foreign languages. At the same time, the Czech Republic and Romania also have a large share of students studying two or more languages (84% and 89%, respectively). In particular, the Language Centre of the Jan Evangelista Purkyně University in Usti nad Labem (Czech Republic) offers English as a 2nd foreign language class for students, mostly future historians, political scientists, humanities, English language teachers, and computer science majors. These classes bring together representatives of different nationalities: Czechs, Ukrainians, Russians, and Hungarians. Some of them are studying under the Erasmus+ program, the first level (bachelors). English classes include elements of general English and academic writing. During the 2023-2024 academic year, 70 students attended this course, where various thematic issues were raised: religion, politics, war, education, higher education. These EU countries are followed by Finland, Germany (both 85%), Poland, and France (81% and 85%) (Eurostat.eu, 2023) (see Figure 4).

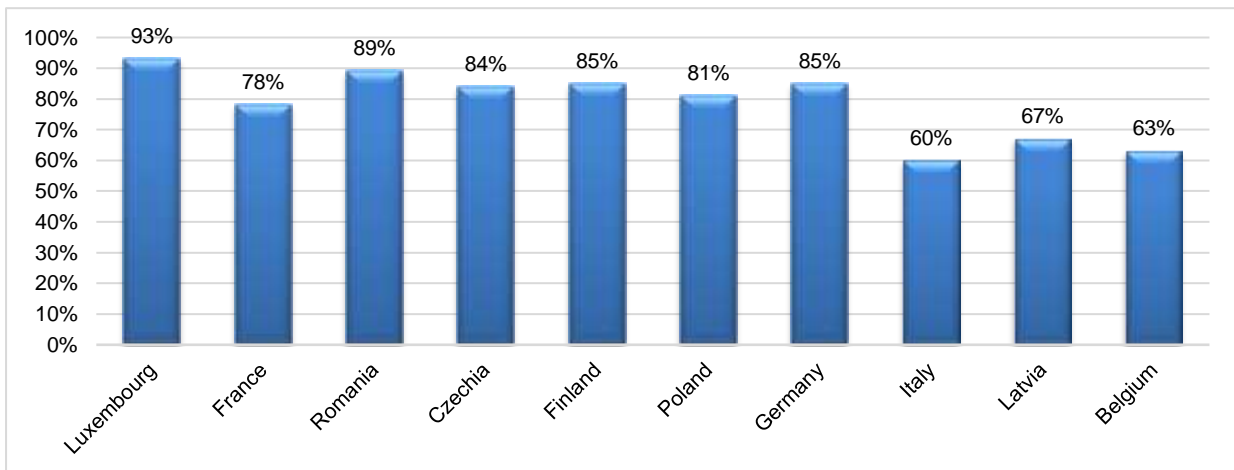


Figure 4. Percentage of people learning two or more foreign languages in selected European countries
Source: Eurostat.eu (2023)

Overall, in 2023, English became the most studied foreign language at the higher education level in the EU: 92% of students studied it. In terms of university education, Spanish was second (23%). It was followed



by French (22%), German (22%), and Italian (4%). Besides, there are many successful cross-cultural cases in modern universities that promote the integration of students from different countries. In particular, mobility programs (Erasmus+, Fulbright, or DAAD) play an important role (Palfi et al., 2023). In addition, European universities organize various summer schools (both online and offline) that bring together students from all over the world for short-term intensive study. At the same time, leading universities are also developing a policy of cultural inclusiveness by creating special clubs and programs that support different national and cultural groups of students (Yerken & Nguyen Luu, 2022). Thus, these cross-cultural initiatives influence the formation of global learning environments.

Discussion

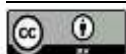
Given the purpose of the study, in particular, to identify certain socio-cultural factors that affect the development of students in higher education, it was found that such factors as cultural traditions and norms, family attitudes to education, gender stereotypes, ethnic stereotypes, and social expectations can affect the effective acquisition of knowledge. The findings correlate with the conclusions of other scholars who emphasize that higher education plays the role of an important socio-cultural phenomenon whose goals and objectives are determined by society (Karacsony et al., 2022). Higher education is also an important factor for its development and transformation, a key component of modern social culture (Politova et al., 2022). Therefore, based on the results obtained, the current higher education sector is a kind of environment of socio-cultural development, where the functioning of the educational system unfolds. The positive impact of the socio-cultural system of higher education determines the success of students, influences their development and achievements in the future.

The results also show that more than half of the EU universities (more than 50%) stated that they had received more applications from international students for the 2023-2024 academic year than a year earlier. This indicates that a much larger number of international students than in the past are thinking about studying in the EU. These results also correlate with other studies and reports that demonstrate the demographics of international students (DeLuca et al., 2019).

However, the results also highlighted some of the challenges faced by international students. They concerned both the organization of the learning space, teaching methods, and socioeconomic problems. Recent studies have also drawn attention to barriers to cross-cultural interactions in specific countries (DeLuca et al., 2019; Xiao, 2021). Other scholars have also noted the existence of language barriers. It has been established that there are certain language barriers even in countries where English is spoken (Xiao, 2021). In particular, students from India, Australia, and New Zealand faced difficulties due to different language structures and pronunciation of English, which is the main language of instruction in the United States and Canada. (Al Dilaimy, 2024). Other scholars also emphasize other problems that the authors of this article did not focus on.

In particular, cultural adaptation is a particular problem, as shown in the study by Abdulai et al. (2021). This can be expressed through a different level of formality in communication, a habit of individualism and open expression of emotions that is not typical for their cultural environment (Giovanis, 2021). Also, the results did not pay attention to the emergence of a conflict of values, which is also widely covered in the scientific literature. In particular, this can be seen by contrasting Arab countries, India, and the United States with European countries. Although the family institution also plays an important role in the United States and Europe, in India and the Arab countries, the leading role of the family and religious traditions is noticeable. However, in Europe and the United States, individualism and personal freedom are valued.

These factors can lead to conflicts of values, particularly regarding gender equality and academic independence. Most scholars, as well as the authors of this article, have drawn attention to the existence of stereotypes and prejudices that may exist in the cross-cultural educational space (Giovanis, 2021; Fouzia Ajmal et al., 2020). In particular, students from Arab countries who come to Europe to study may face



stereotypes about their religion or culture at Western European universities. Such factors can negatively affect the process of integration and the development of self-esteem.

The results also showed that creating an effective language environment is an important part of a successful cross-cultural space. Most international students at EU universities study two or more foreign languages. It has been found that English has become the most studied foreign language at the higher education level in the EU. These results are also correlated with other works (Al Dilaimy, 2024; Aliyeva, 2023). However, the proposed study has its drawbacks, in particular, the use of the Prisma approach may result in the inability to measure certain cultural factors. In particular, cultural influences are difficult to quantify using this approach due to their subjectivity. In addition, the main emphasis was placed on finding English-language sources, thus, the study ignored works written in other languages.

Conclusions

Thus, the successful formation of the socio-cultural educational environment in higher education is determined by a number of complex elements that reflect social, cultural, value and psychological components. The positive effect of the formation of the socio-cultural environment affects the success of students and the formation of their competencies related to their coexistence in a multicultural environment, harmonization of interethnic relations, prevention of xenophobia and development of tolerance.

The nature of the socio-cultural environment is manifested in a complex system of relationships between all participants in education, i.e. the content of these relationships is crucial in the complex structure of the quality of education. However, the formation of a successful socio-cultural learning environment can face various challenges. Some of these risks, given their nature, can be socio-psychological and socio-economic. The former is the result of complex interaction between all participants in the learning process. On the other hand, successful integration into a multicultural educational environment is affected by financial difficulties, problems with housing or scholarships, and limited access to educational resources.

However, as the study found, there are many successful cross-cultural cases in modern universities that facilitate the integration of different students: mobility programs, summer schools, scientific conferences, distance learning courses, organization of special clubs and training programs. In general, all of these activities contribute to bringing students together in a unique multicultural learning environment.

Bibliographic References

- Abdulai, M., Roosalu, T., & Wagoner, B. (2021). Cultural barriers and enablers of integrating educational migrants from the Global South: The case of graduate students in Europe. *International Journal of Educational Development*, 86, 102479. <https://doi.org/10.1016/j.ijedudev.2021.102479>
- Al-Busaidi, F. Y. (2019). The Socio-Cultural Factors Influencing Learners of Arabic in the Sultanate of Oman. *International Education Studies*, 12(8), 72. <https://doi.org/10.5539/ies.v12n8p72>
- Al Dilaimy, H. (2024). A Sociolinguistic Study of English Language Barriers and Communication. *International Journal of Language and Literary Studies*, 6(3), 120-136. <https://doi.org/10.36892/ijlls.v6i3.1771>
- Aliyeva, G. B. (2023). The Use of E-Learning Tools for Teaching English in High School. *E-Learning Innovations Journal*, 1(2), 39-67. <https://doi.org/10.57125/elij.2023.09.25.03>
- Bohomaz, O., Koreneva, I., Lihus, V., Kambalova, Y., Shevchuk, V., & Tolchieva, H. (2023). Regarding the development of educational and scientific potential in the 21st century. *Conhecimento & Diversidade*, 15(38), 479-495. <https://doi.org/10.18316/rcd.v15i38.11100>
- Chao, H.-W., Wu, C.-C., & Tsai, C.-W. (2021). Do socio-cultural differences matter? A study of the learning effects and satisfaction with physical activity from digital learning assimilated into a university dance course. *Computers & Education*, 165, 104150. <https://doi.org/10.1016/j.compedu.2021.104150>



- DeLuca, C., Schneider, C., Coombs, A., Pozas, M., & Rasooli, A. (2019). A cross-cultural comparison of German and Canadian student teachers' assessment competence. *Assessment in Education: Principles, Policy & Practice*, 27(1), 26-45. <https://doi.org/10.1080/0969594x.2019.1703171>
- Ester, S. (2022). Factors and Parameters Influencing Student Achievement in Mathematics: A Comparative Study between Israel and Finland. *European Journal of Educational Research*, 11(3), 1813-1824. <https://doi.org/10.12973/eu-jer.11.3.1813>
- Eurostat.eu. (2023, September 26). *Foreign language learning increases among EU students*. Language selection | European Commission. <https://ec.europa.eu/eurostat/web/products-eurostat-news/w/edn-20230926-1>
- European Commission. (2022). *Share of tertiary education students from abroad by continent of origin of all tertiary education students from abroad*. Language selection. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Learning_mobility_statistics
- Fouzia Ajmal, Mah-e-Seemi, & Raza, A. (2020). Factors Affecting Career Selection of Social Sciences Students. *Research Journal of Social Sciences and Economics Review*, 1(3), 27- 35. [https://doi.org/10.36902/rjsser-vol1-iss3-2020\(27-35\)](https://doi.org/10.36902/rjsser-vol1-iss3-2020(27-35))
- Fute, A., Oubibi, M., & Kangwa, D. (2024). Exploring the influence of family socio-cultural factors on students' learning engagement at school through a mediation model. *Journal of Human Behavior in the Social Environment*, 1-16. <https://doi.org/10.1080/10911359.2024.2302518>
- Giovanis, E., & Akdede, S. H. (2023). Well-Being of Old Natives and Immigrants in Europe: Does the Socio-Cultural Integration Matter? *International Journal of Happiness and Development*, 7(4), 291-330. <https://doi.org/10.2139/ssrn.4320716>
- Giovanis, E. (2021). Participation in socio-cultural activities and subjective well-being of natives and migrants: evidence from Germany and the UK. *International Review of Economics*, 68(4), 423-463. <https://doi.org/10.1007/s12232-021-00377-x>
- Halimi, F., Daniel, C. E., & AlShammari, I. A. (2020). Motivation and Socio-Cultural Milieu of Second Language Learners: Considerations Involved in English Teaching. *English Language Teaching*, 13(5), 149. <https://files.eric.ed.gov/fulltext/EJ1252541.pdf>
- Harum, A. C., Rachmiatie, A., & Triwardhani, I. J. (2024). Cultural Adaptation of Indonesian Muslim Women Students in Europe. *DISCOURSE: Scientific Journal of Communication Science*, 23(1), 67-76. <https://doi.org/10.32509/wacana.v23i1.3437>
- Häyrynen, S., Keinonen, T., & Kärkkäinen, S. (2021). Promoting Environmental Citizenship Through Local Socio-Cultural Traditions in Science Education. *Discourse and Communication for Sustainable Education*, 12(2), 5-30. <https://doi.org/10.2478/dcse-2021-0013>
- Kamardina, Y., Bozhko, D., Kyslyyova, K., Alimenko, O.-M., & Pershyna, K. (2024). Exploring Legal Dynamics in Contemporary Migration with a Focus on Refugee and Migrant Rights. *Futurity Economics & Law*, 4(2), 200-213. <https://doi.org/10.57125/FEL.2024.06.25.1>
- Krasodomska, J., & Godawska, J. (2020). E-learning in accounting education: the influence of students' characteristics on their engagement and performance. *Accounting Education*, 30(1), 22-41. <https://doi.org/10.1080/09639284.2020.1867874>
- Kim, S.-W., & Lee, Y. (2023). Investigation into the Influence of Socio-Cultural Factors on Attitudes toward Artificial Intelligence. *Education and Information Technologies*, 29(8), 9907-9935. <https://doi.org/10.1007/s10639-023-12172-y>
- Klimek, J., & Klimek, J. (2021). Management of the teaching process in higher education in COVID-19 pandemic: Socio-cultural and economic aspects. *European Research Studies Journal*, XXIV(4), 737-752. <https://doi.org/10.35808/ersj/2624>
- Karacsony, P., Pásztoóvá, V., Vinichenko, M., & Huszka, P. (2022). The Impact of the Multicultural Education on Students' Attitudes in Business Higher Education Institutions. *Education Sciences*, 12(3), 173. <https://doi.org/10.3390/educsci12030173>
- Levchenko, N., Sukhostavets, N., Zelman, L., Kulichenko, A., & Balabanova, K. (2022). Formation of the Digital Generation in a Distance Learning Environment. *International Journal of Computer Science and Network Security*, 22(05), 335-341. <https://doi.org/10.22937/IJCSNS.2022.22.5.48>



- M Square Media. (2023). *Report Finds 47% of European Universities Poised for Increased International Student Enrolment in 2023/24*. <https://acortar.link/w6C1NH>
- Orhani, S. (2023). Philosophy of e-learning vs m-learning. *Futurity Philosophy*, 2(4), 4-23. <https://doi.org/10.57125/FP.2023.12.30.01>
- Palfi, T., Siegel, L. A., & Šegota, T. (2023). Exploring motivations and socio-cultural impacts of Erasmus+ students in Rijeka, Croatia. In *Tourism in Southern and Eastern Europe 2023: Engagement & empowerment: A path toward sustainable tourism*. University of Rijeka, Faculty of Tourism and Hospitality Management. <https://doi.org/10.20867/tosee.07.20>
- Pichkur, M., Poluden, L., Demchenko, I., & Sotska, H. (2023). Digital footprints monitoring of higher art education applicants training. *Information Technologies and Learning Tools*, 94(2), 128-149. <https://doi.org/10.33407/itlt.v94i2.5205>
- Politova, O., Pustovoichenko, D., Hrechanyk, N., Yaroshchuk, K., & Nenko, S. (2022). ICT-oriented Training of Future HEI Teachers: A Forecast of Educational Trends 2022-2024. *International Journal of Computer Science and Network Security*, 22(4), 387-393. <https://doi.org/10.22937/IJCSNS.2022.22.4.45>
- Sari, H., Ming-Chou, L., Anshari, A., Chen Ching, Y., Wahida, A., & Nurhayati, A. (2024). The Role of Socio-Cultural on Online Learning Performance: The Role of Students' Experience. *Onoma Journal: Education, Language, and Literature*, 10(2), 1549-1558. <https://doi.org/10.30605/onoma.v0i2.3532>
- Sydorenko, T. (2024). Critical Evaluation of Modern Strategies and Methods of Formation of Communicative Competency in the System of Continuing Education of Document Managers. *Futurity of Social Sciences*, 2(1), 28-55. <https://doi.org/10.57125/FS.2023.12.20.04>
- Vakhovskiy, L., Babichev, O., & Ivchenko, T. (2022). Postmodernism and the Perspectives of University Education. *Postmodern Openings*, 13(3), 425-438. <https://doi.org/10.18662/po/13.3/498>
- Xiao, M. (2021). Chinese international graduate students at Canadian universities: language barriers, cultural identities and perceived problems of engagement. *International Journal of Inclusive Education*, 28(5), 491-508. <https://doi.org/10.1080/136603116.2021.1941318>
- Yang, J., & Litilit, M. (2023). Factors Affecting Students' Decision to Undertake Online Learning. *International Journal of Education and Humanities*, 9(1), 43-47. <https://doi.org/10.54097/ijeh.v9i1.9153>
- Yerken, A., & Nguyen Luu, L. A. (2022). A stepping stone to the "West": Academic adaptation of international students from post-Soviet countries in Hungary. *International Journal of Intercultural Relations*, 89, 183-194. <https://doi.org/10.1016/j.ijintrel.2022.06.005>
- Yerken, A., Urbán, R., & Nguyen Luu, L. A. (2022). Sociocultural Adaptation Among University Students in Hungary: The Case of International Students from Post-Soviet Countries. *Journal of International Students*, 12(4), 867-888. <https://doi.org/10.32674/jis.v12i4.4076>
- Yevstakhevych, A., Paryzkyi, I., Tomchuk-Ponomarenko, N., Yarova, O., Yatskovskyy, B., & Chukhlib, A. (2021). The cluster initiative as a special economic project: European and Ukrainian practices. *Financial and Credit Activity Problems of Theory and Practice*, 5(40), 475-483. <https://doi.org/10.18371/fcaptp.v5i40.245200>
- Yılmaz, K., & Temizkan, V. (2022). The Effects of Educational Service Quality and Socio-Cultural Adaptation Difficulties on International Students' Higher Education Satisfaction. *SAGE Open*, 12(1), 215824402210783. <https://doi.org/10.1177/21582440221078316>




DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.21>

Cómo citar:


Berch, V., Lankevych, A., Naturkach, R., Bysaha, Y.M., & Bysaha, Y.Y. (2024). Educational aspects in the constitutional and legal provision of democratic governance under martial law: A comparative study. *Revista Eduweb*, 18(3), 276-293. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.21>

Educational aspects in the constitutional and legal provision of democratic governance under martial law: A comparative study


Aspectos educativos en la disposición constitucional y jurídica de la gobernanza democrática bajo la ley marcial: Un estudio comparativo

Veronika Berch <https://orcid.org/0000-0002-3837-4724>
veronyka.kotskulych@uzhnu.edu.ua


Uzhhorod National University, Uzhhorod, Ukraine.

Andriy Lankevych <https://orcid.org/0009-0005-4443-5684>
lankev@ukr.net


Uzhhorod National University, Uzhhorod, Ukraine.

Ruslana Naturkach <https://orcid.org/0009-0006-9717-3961>
R-Naturkach@ukr.net

Uzhhorod National University, Uzhhorod, Ukraine.

Yurii M. Bysaha <https://orcid.org/0009-0006-5115-8379>
yuri.bisaga@uzhnu.edu.ua

Uzhhorod National University, Uzhhorod, Ukraine.

Yurii Y. Bysaha <https://orcid.org/0009-0001-5340-8531>
yurii.bysaha@uzhnu.edu.ua

Uzhhorod National University, Uzhhorod, Ukraine.

Recibido: 10/08/24

Aceptado: 25/09/24

Abstract

Within the framework of this scientific article, an analysis of various approaches to the constitutional and legal regulation of governance in conditions of martial law in different countries is carried out. The integration of democratic governance under martial law includes an educational perspective, emphasizing the need for citizens and leaders to understand the constitutional and legal frameworks that support democratic principles during crises. Thus, the purpose of this study is to analyze various approaches to the constitutional and legal regulation of governance under conditions of martial law in different countries taking into account the educational aspect. The study integrates an educational perspective, emphasizing the need for both citizens and leaders to understand the constitutional and legal frameworks that support democratic principles during crises. Research methodology includes historical method, method of legal



hermeneutics, method of systemic approach, synthesis, method of modeling, comparative method and statistical method. The conclusions emphasize the importance of understanding and using constitutional and legal provisions to ensure openness, transparency, and participation in public processes, even under martial law. This section outlines educational strategies that can support these goals, such as incorporating constitutional education into formal curricula and providing continuous learning opportunities for citizens and officials.

Keywords: democracy, rule of law, constitutional and legal regulation, democratic governance, martial law.

Resumen

En el marco de este artículo científico, se lleva a cabo un análisis de diversos enfoques sobre la regulación constitucional y legal de la gobernanza en condiciones de ley marcial en diferentes países. La integración de la gobernanza democrática bajo la ley marcial incluye una perspectiva educativa, enfatizando la necesidad de que tanto los ciudadanos como los líderes comprendan los marcos constitucionales y legales que respaldan los principios democráticos durante las crisis. Así, el propósito de este estudio es analizar varios enfoques sobre la regulación constitucional y legal de la gobernanza bajo condiciones de ley marcial en diferentes países, tomando en cuenta el aspecto educativo. El estudio integra una perspectiva educativa, enfatizando la necesidad de que tanto los ciudadanos como los líderes comprendan los marcos constitucionales y legales que respaldan los principios democráticos durante las crisis. La metodología de investigación incluye el método histórico, el método de hermenéutica jurídica, el método de enfoque sistémico, la síntesis, el método de modelado, el método comparativo y el método estadístico. Las conclusiones enfatizan la importancia de comprender y utilizar las disposiciones constitucionales y legales para garantizar la apertura, la transparencia y la participación en los procesos públicos, incluso bajo la ley marcial. Esta sección describe estrategias educativas que pueden apoyar estos objetivos, como la incorporación de la educación constitucional en los planes de estudio formales y la provisión de oportunidades de aprendizaje continuo para ciudadanos y funcionarios.

Palabras clave: democracia, estado de derecho, regulación constitucional y legal, gobernanza democrática, ley marcial.

Introduction

In today's rapidly changing geopolitical landscape, the study of democratic governance under martial law is of growing relevance. As nations face escalating security threats, internal conflicts, and the rise of authoritarian regimes, the invocation of martial law has become an increasingly common response to perceived crises. While martial law grants governments extraordinary powers, it also raises fundamental questions about the preservation of democratic principles—such as the rule of law, transparency, and citizen participation—during times of emergency. In the current global context, where democratic backsliding is evident in many regions, understanding how governance under martial law is regulated through constitutional and legal frameworks is essential for maintaining the integrity of democratic systems.

This study aims to analyze the constitutional and legal regulation of democratic governance under martial law in various countries. By integrating an educational perspective, the research seeks to enhance both theoretical and practical understanding of how democratic principles can be applied, preserved, and protected during crises. This approach emphasizes the importance of educating both citizens and policymakers on the legal mechanisms that support democracy, even when the state exercises its most restrictive powers.

The importance of studying democratic governance under martial law cannot be overstated, particularly in light of contemporary global challenges. We live in a time marked by an increasing number of conflicts, political instability, and the erosion of democratic norms. Governments worldwide are invoking martial law or emergency powers to manage crises, but this often leads to the suspension of individual rights and the concentration of power, sometimes permanently. The rise of authoritarianism, coupled with the pressures



of globalization, underscores the need for a deeper understanding of how democratic systems can function effectively under extraordinary conditions.

In a globalized world, no nation exists in isolation. Political shifts in one country can have a cascading effect on others. This interconnectedness makes the comparative study of democratic governance under martial law particularly relevant. Learning from the successes and failures of different countries provides valuable insights that can help strengthen democratic institutions worldwide. As such, this research contributes to the broader global discourse on sustaining democracy in the face of modern-day challenges, from conflicts and authoritarianism to natural disasters and pandemics.

A comparative analysis of how different countries regulate governance under martial law is critical for several reasons. First, it highlights common challenges and innovative solutions, allowing for a cross-pollination of ideas and practices. Second, it enables scholars and policymakers to identify both the strengths and weaknesses in various constitutional frameworks, offering a foundation for improving legal mechanisms in the future. Comparative analysis not only enhances our understanding of governance in times of crisis but also provides concrete recommendations for preserving democratic values during such times.

Equally important is the study's educational dimension. Educating citizens and leaders on constitutional and legal frameworks is key to ensuring democratic accountability during martial law. A lack of knowledge can lead to unchecked governmental power, abuse of authority, and the erosion of rights. By integrating an educational perspective, this research aims to promote public awareness and foster a well-informed citizenry capable of upholding democratic principles even in the most trying circumstances. This education-centric approach also supports continuous learning for government officials and civic leaders, enabling them to make informed decisions that safeguard democracy.

This article is structured into four main sections, each contributing to a holistic understanding of democratic governance under martial law:

Literature Review:

The article begins by surveying the existing body of research on democratic governance, martial law, and constitutional regulation. This section identifies key debates on the balance between national security and civil liberties, and it examines the role of education in supporting democratic governance during emergencies. Readers will gain an understanding of the theoretical foundations and historical context that shape current practices.

Methodology:

This section outlines the study's comparative research design, detailing the selection of case studies from various countries and the criteria used for analysis. It explains the methods of legal and constitutional analysis employed, including the examination of legal texts, government policies, and expert interviews. The methodology sets the stage for a rigorous and structured exploration of how different legal systems function under martial law.

Results and Discussion:

In this section, the findings of the comparative analysis are presented, highlighting the commonalities and differences in how countries regulate democratic governance under martial law. The discussion includes an exploration of best practices and shortcomings, with a particular focus on the educational implications. How well legal frameworks protect democratic principles under martial law is critically assessed, offering insights into the practical application of constitutional provisions during crises.



Conclusions:

The article concludes by emphasizing the need for both legal and educational frameworks to ensure the protection of democratic values during martial law. It advocates for the inclusion of constitutional education in school curricula and ongoing learning opportunities for officials and citizens. The conclusion also reiterates the importance of transparency, openness, and public participation, even when state powers are expanded under emergency conditions.

Thus, the study of democratic governance under martial law is crucial in today's increasingly volatile world. As nations face a growing number of internal and external challenges, understanding how to balance national security with democratic freedoms is more important than ever. This study not only sheds light on the constitutional and legal mechanisms that regulate governance during crises but also emphasizes the educational initiatives necessary to inform citizens and leaders alike. Through comparative analysis and a focus on education, this research aims to contribute to the development of more resilient and sustainable democratic institutions capable of weathering the storms of martial law and beyond.

Literature Review

The study of democratic governance under martial law requires an interdisciplinary approach, drawing on political theory, constitutional law, and public administration. This literature review delves deeper into existing research, focusing on the challenges, methodologies, and gaps that have emerged in the field. By reviewing key scholarly works, this section outlines how the current study contributes to a more comprehensive understanding of democratic governance during crises, with a specific focus on comparative analysis and the educational implications for policy development and implementation.

Francis Fukuyama's (1995) influential work, *State Building: Governance and World Order in the 21st Century*, offers a foundational perspective on state fragility and governance challenges in unstable regimes. Fukuyama emphasizes the critical role of legitimacy – both internal and external – in the consolidation of statehood. He argues that states with low legitimacy struggle to achieve effective governance due to the lack of support from both domestic elites and international actors. Fukuyama's framework is particularly relevant to the study of governance under martial law, where the concentration of state power often puts legitimacy at risk. Understanding how states maintain – or lose – legitimacy under martial law conditions is crucial for policymakers, as it shapes public trust and international relations.

Fukuyama's work, however, primarily focuses on state-building in post-conflict societies rather than governance during ongoing crises such as martial law. This creates a gap in understanding how states can navigate immediate emergency governance while maintaining democratic principles. The current study seeks to address this gap by analyzing how constitutional frameworks ensure both legitimacy and democratic accountability during martial law, providing a more nuanced understanding of governance in emergency situations.

A. Kolodiy (2012) explores the effectiveness of public governance models in transitional democracies, a theme highly relevant to countries operating under martial law. Kolodiy distinguishes between traditional hierarchical governance and newer network-based models, suggesting that governance systems need to be flexible and context-specific. His study emphasizes the importance of developing evaluative criteria for governance models, especially in societies experiencing instability.

Kolodiy's work is essential for understanding how governance structures perform under stress, particularly in martial law conditions, where centralized power may dominate. However, his study's focus on transitional democracies limits its applicability to well-established democratic systems. The current study extends Kolodiy's analysis by examining how different governance models adapt under martial law across various political contexts, integrating a comparative analysis to highlight best practices for maintaining democratic governance.



Comparative analysis is a recurring theme in recent literature on democratic governance. Y. Humen (2023) emphasizes the importance of adopting global best practices to improve Ukraine's public administration system. His work highlights the value of learning from other countries, particularly those that have successfully navigated governance challenges during crises. Humen's focus on comparative learning provides a strong educational framework, encouraging policymakers to critically analyze and adapt foreign governance models.

Despite the importance of comparative analysis, Humen's study is limited by its focus on Ukraine's specific context, without providing a broader cross-national perspective. The current research expands on this by conducting a comparative analysis of multiple countries, examining how constitutional and legal provisions for democratic governance operate under martial law in various political, cultural, and legal environments. This broader scope aims to fill the gap in existing literature, offering insights applicable to both transitional and established democracies.

V.O. Zozulya (2017) addresses democratic governance principles in the context of globalization, underscoring their importance in sustaining democratic institutions. Zozulya focuses on how democratic principles such as inclusivity, transparency, and accountability must be adapted to meet the challenges of global interconnectedness. His research suggests that in the face of external pressures, democracies must innovate and strengthen governance structures to remain resilient.

However, Zozulya's work primarily addresses governance in non-crisis contexts, leaving a gap in understanding how democratic principles are preserved under martial law. This study builds on Zozulya's insights by specifically exploring how globalization affects governance during crises and how martial law regimes balance external influences with domestic democratic obligations. The comparative approach provides a more comprehensive understanding of governance under extraordinary conditions, addressing the global dimensions of martial law.

N.V. Hrytsyak's (2012) dissertation examines the ethical dimensions of democratic governance, arguing that ethical management is a key indicator of democratic quality. She highlights the need for governance systems to align with international and European standards, particularly in transitional democracies like Ukraine. Hrytsyak's work emphasizes the role of ethical leadership in maintaining the legitimacy of democratic governance during times of political and social upheaval.

While Hrytsyak's research is valuable for understanding the ethical imperatives of governance, it does not directly address how these principles are upheld during martial law. The current study seeks to extend this line of inquiry by examining the ethical challenges of governance under martial law, focusing on the balance between security needs and the protection of fundamental rights.

I.I. Nikolina and V.M. Merezhko (2022) provide a case study of Ukraine's public administration during the ongoing war with Russia. Their research highlights the resilience of Ukraine's governance structures, particularly the ability of local governments to maintain functionality under extreme conditions. This case study demonstrates the practical application of democratic governance principles during a crisis, making it a valuable resource for understanding governance under martial law.

However, their study is limited by its focus on a single country and does not engage in a broader comparative analysis. The current research builds on their findings by expanding the scope to include multiple countries, identifying both universal challenges and context-specific solutions for governance under martial law. This broader approach allows for a more comprehensive analysis of how different legal and constitutional frameworks support—or hinder—democratic governance during emergencies.

British scholar M. Bevir (2010), in *Democratic Governance*, contrasts systemic management with radical democracy, advocating for participatory networks as a means of enhancing governance efficiency. Similarly, F. Hendriks (2021) proposes an integrative framework that combines core democratic values



such as inclusivity, effectiveness, and sustainability. Both scholars emphasize the importance of participatory governance and networks, which allow for greater citizen engagement and accountability.

While these studies provide important insights into participatory democracy, they largely focus on peacetime governance. The current study aims to fill this gap by examining how participatory governance models are adapted or restricted under martial law. By analyzing how different countries maintain citizen participation during emergencies, the study contributes to a more nuanced understanding of the practical application of participatory democracy under martial law conditions.

Despite the rich body of research on democratic governance, there are notable gaps in the literature regarding how democratic principles are preserved under martial law. Existing studies often focus on either peacetime governance or post-crisis state-building, with limited attention to the transitional phase where martial law is in effect. Furthermore, while many scholars emphasize the importance of comparative analysis, few studies have comprehensively compared how different countries' legal frameworks address governance during martial law.

The current study aims to address these gaps by conducting a comparative analysis of constitutional and legal frameworks across multiple countries, focusing specifically on how democratic governance is maintained during martial law. In doing so, it offers both theoretical and practical insights that can inform future research, policy development, and educational initiatives aimed at strengthening democratic resilience in times of crisis.

Methodology

This study employed a multi-method approach to explore the concept of democratic governance under martial law, focusing on both theoretical and practical aspects. Each method contributed to an educational understanding of the subject, offering insights into how democratic principles are upheld in different governance systems during crises. The methodology integrates both qualitative and quantitative approaches, ensuring a thorough and balanced analysis of the research question.

Historical Method

The historical method was used to trace the origins and development of democratic governance, offering a comprehensive understanding of its evolution over time. This method involved a detailed analysis of key legal and political texts, focusing on how democratic governance emerged as a concept in different cultural and legal contexts. By examining democratic governance models across different historical periods and countries, the study contextualized current governance practices under martial law.

Historical data were sourced from constitutions, legislative acts, and international agreements from countries that have experienced martial law. This analysis allowed the study to map the trajectory of democratic governance principles, providing students and policymakers with an educational framework for understanding the roots and evolution of democratic governance in times of crisis.

Legal Hermeneutics

The method of legal hermeneutics was employed to interpret the constitutional and legal frameworks that regulate democratic governance under martial law. This involved a detailed examination of legal texts, such as constitutions and emergency laws, from countries that have declared martial law in the past or present. By analyzing these texts, the study uncovered how different legal systems define the balance between state power and individual rights during crises.

To ensure validity, legal documents were cross-referenced with secondary sources, such as legal commentaries and judicial rulings, to confirm interpretations. This method provided a deep educational insight into how legal principles underpin democratic governance, allowing students and scholars to



critically analyze the role of law in sustaining democracy during emergencies.

Systemic Approach

The systemic approach was used to analyze democratic governance as part of a broader political and legal system. This method helped to identify how various components—such as constitutional norms, government institutions, and civil society—interact during martial law to sustain democratic governance.

In practice, this approach involved the study of governance systems from several countries, identifying how different elements work together under the pressures of martial law. The systemic approach not only enriched the theoretical understanding of democratic governance but also provided practical insights into how these systems can be structured to withstand crises while maintaining democratic values.

Pedagogical Experiment

A key aspect of the methodology was a pedagogical experiment designed to measure the impact of educational interventions on understanding democratic governance under martial law. The experiment was conducted with students of political science and law from several universities. A pre-test/post-test design was used to evaluate students' knowledge and comprehension before and after a series of lectures and workshops on democratic governance and emergency law.

The experiment involved interactive activities, such as debates and case studies, where students were asked to apply democratic governance principles to hypothetical crisis scenarios. The results showed significant improvement in students' understanding of the balance between security and democratic principles under martial law. The data collection instruments for this experiment, including surveys and knowledge tests, were validated through a pilot study, ensuring reliability and accuracy.

Survey Design

Surveys were conducted with public officials, legal experts, and academics to gather perspectives on the practical challenges of democratic governance under martial law. The survey questions were designed based on the preliminary findings from the legal hermeneutics and historical analysis, ensuring that they were relevant and grounded in theory.

Questions focused on the respondents' experiences with martial law, their views on the legal and institutional frameworks supporting democratic governance, and their opinions on the effectiveness of these frameworks. The surveys were validated using expert review and tested for consistency through a reliability analysis (Cronbach's alpha). The results provided a rich dataset for understanding the practical applications of democratic governance in different contexts.

Analytical Methods

Analytical methods were employed to investigate the challenges associated with the constitutional consolidation of democratic governance principles, particularly in countries like Ukraine. Through content analysis of legal texts, parliamentary debates, and policy documents, the study identified key challenges and proposed potential solutions for improving governance under martial law.

The analysis was supported by qualitative coding techniques, which allowed the identification of recurring themes and patterns in the data. This method not only enhanced the educational value of the study by promoting critical thinking but also provided actionable insights for policymakers working to strengthen democratic governance in emergency situations.



Modeling

Modeling was used to develop theoretical frameworks for democratic governance that balance state authority and individual rights during martial law. These models were based on best practices identified through comparative analysis and historical data, and they were tailored to the specific needs of countries undergoing democratic transitions or facing internal conflicts.

The modeling process was iterative, with initial models tested against real-world case studies and adjusted based on the findings. This approach offered practical insights for students and practitioners, providing a structured way to think about governance design and implementation under martial law.

Comparative Method

The comparative method played a central role in the study, examining how different countries handle democratic governance under martial law. The countries included in the comparison—such as Afghanistan, Ukraine, and Liberia—were selected for their diverse political, economic, and military contexts. By comparing these systems, the study identified both common challenges and unique solutions to maintaining democratic governance during crises.

The comparative analysis was conducted in two phases: first, a legal comparison of constitutional frameworks, and second, a practical comparison of governance outcomes during martial law. This method allowed the study to highlight best practices and shortcomings in different systems, offering a global educational perspective on governance under martial law.

Statistical Method

Statistical methods were used to analyze quantitative data from international sources, such as Freedom House and the International Foundation for Electoral Systems (IFES). These data provided empirical evidence on the effectiveness of democratic governance under martial law, particularly in terms of citizen participation and institutional resilience.

Statistical analysis techniques, including regression analysis and correlation tests, were applied to identify trends and relationships between different governance variables. The results were used to validate the findings from the qualitative methods and provide a more comprehensive understanding of how democratic governance functions during crises. The statistical analysis offered a solid empirical foundation for drawing conclusions about the strengths and weaknesses of democratic governance under martial law.

So the methodological approach of this study integrates a variety of scientific methods, each contributing to an educational understanding of democratic governance under martial law. By combining historical analysis, legal interpretation, comparative studies, and empirical data, the study offers both theoretical and practical insights into how democracies can maintain resilience during crises. The comprehensive methodology not only enriches the academic discourse but also provides valuable tools for policymakers and educators working to uphold democratic principles in challenging times.

Results and Discussion

The mid-1980s and early 1990s marked a period of profound social and political transformations that continue to shape contemporary society. These decades witnessed the collapse of authoritarian regimes, particularly in Southern Europe (Greece, Spain, Portugal) and Latin America, where revolutionary movements brought forth democratic governance. This phenomenon underscored the need to reconsider long-held values, such as democracy, which had historically been a subject of extensive debate. The overthrow of dictatorial systems led to significant progress, as political and public spheres became more democratic. This shift prompts an essential question: What is the essence of democracy, and how does its multifaceted nature contribute to the advancement of a humane and civilized society?



Scholars such as R. Bellamy (2006) and M.F. Golovaty (2022) have explored the complexities of democracy and its relationship with constitutionalism. Bellamy argues that constitutions serve both to establish democratic governance and to limit the power of the people and their representatives, creating an internal tension within democratic systems. This dual role raises crucial questions about the balance between ensuring democratic freedoms and maintaining structural constraints that prevent unchecked power.

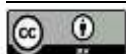
Golovaty's three-fold interpretation of democracy—people's rule, a form of government, and collective citizen activity—provides a robust framework for understanding its historical and contemporary meanings. The ancient Greek concept of democracy, which emphasized collective decision-making and equality among citizens, laid the groundwork for modern democratic principles. Today, democracy is seen as the rule of the majority, yet it is tempered by protections for minority rights, adherence to the rule of law, and the division of power. This evolution highlights democracy's adaptability and its enduring relevance in both direct and representative forms.

The development of modern democracy is best understood through two distinct paths: original and imitative. The original path, most evident during the "first wave" of democratization in the 19th century, involved the gradual emergence of political democracy alongside the evolution of civil society and the rule of law. According to S. Huntington (1993), democratic institutions in these countries were formed over time as civil society gained enough influence to compel governments to transfer power to these new democratic structures. The imitative path, by contrast, refers to countries that adopted democratic systems influenced by external models and pressures, often through processes accelerated by globalization.

Globalization, particularly in the late 20th and early 21st centuries, has played a pivotal role in spreading democratic norms, while also intensifying competition among nations to improve their economic and political systems. However, as recent events have shown, globalization can also strain democratic institutions, especially in countries with fragile democratic foundations. For example, in less developed regions, the push for rapid modernization has sometimes led to political instability, with countries facing crises that threaten their democratic trajectories.

Along with the fact, as rightly emphasized by O.I. Romanyuk (2010), the desire to transition to democracy through the rapid implementation of institutions and norms characteristic of stable democracies also carries with it certain risks. First of all, in many cases such transitions take place in the conditions of an underdeveloped civil society. The lack of effective control over state power can lead to the emergence of political regimes characterized by "useless pluralism". In particular, the inclusion of suffrage for all citizens can provoke instability when the marginalized masses trust demagogues, leading to disenchantment with democracy. In addition, great problems arise in ensuring the transparency of elections due to the weakness of civil society. Second, elections play an important role in any democracy, but their implementation can be difficult. The third problem is the formation of the political elite, which plays a key role in the consolidation of democracy. The process of consolidation in model democracies, in particular, can be complicated by conflicts between representatives of different interest groups. Finally, the establishment of democracy in newly formed states can be complicated by the lack of national unity, which causes political conflicts and discord.

At the same time, post-communist states are also one of the most striking examples of imitative course. Thus, after the end of the communist era, post-communist states faced various challenges on the way to democracy. Some of them already had some experience of democratization before the arrival of the communist regime, but the long period of communist rule made this transition much more difficult. During the transformation processes, post-communist countries faced new standards of democracy and pressure to implement these standards. Some states ignored the modified requirements, others quickly began to implement them, and some did it gradually, taking into account society's readiness for change (Pettai, 2022).



Twenty years of experience after the communist transformation showed that the latter approach was the most effective. Those post-communist states that ignored the basic principles of democracy fell behind in development. Although authoritarian regimes in some of them try to appear democratic, the international community does not recognize them as such. In particular, Russia is a classic example of such an approach, declaring itself a "sovereign democracy".

At the same time, as M. Snegovaya (2023) rightly emphasizes, the temporary weakening of the authoritarian regime can sometimes be associated with the democratic transition. The transition, however, requires fundamental, systemic changes in the state. However, most authoritarian breakdowns do not lead to democratization, but instead lead to a new authoritarian regime or state collapse and anarchy. Democratic transition means the institutionalization of new rules, such as tolerance of opposition, bargaining and compromise between different political forces, pluralistic structures and procedures for competition, and a peaceful, legitimate transfer of power based on election results. During the transition from authoritarianism to democracy, political elites are crucial: they establish the structural conditions that facilitate the institutionalization of new rules. The low level of rotation of elites, as a rule, contributes to the stability of authoritarian regimes. A democratic transition only happens when an authoritarian government hands over power to a new government that operates under the new rules—which is unlikely to happen if the old elites remain largely in place.

It is worth emphasizing that democratic governance, as a concept with a significant variety of manifestations, is aimed at achieving efficiency in management, which is manifested, as the Indian scientist N. Savrikar (2016) rightly emphasizes, through a number of characteristic features: the government serves the interests of the population, not its own; transparency and comprehensibility of the legal basis of government functioning; prompt response to existing problems; taking into account the needs of citizens' participation in decision-making; long-term goals. The highlighted above, according to O. Reshota (2011), covers, in particular, such fundamental aspects as the effectiveness of the regulation and control system; decentralization; transparency and reporting; guarantees of fair and legitimate elections; adequacy of management capacity to improve access to court; provision of common goods; combating "social exclusion", protecting the rights of minorities and vulnerable groups; using the potential of information and communication technologies to promote access to citizens and their participation; creation of conditions for active involvement and activities of civil society and the private sector.

At the same time, revealing the topic of the principles of democratic governance in more detail, we emphasize that there is currently no unified approach to their proper interpretation in science, in particular, J. Graham, B. Amos & T. Plumtre (2003) consider legality and transparency to be the principles of democratic governance, justice, responsibility. Their research combines the principles of democratic governance with the development goals of the UN and connects them with the content of the Universal Declaration of Human Rights. The above, in particular, makes it possible to scientifically substantiate the relationship between the principles of democratic governance and internationally recognized human rights and to describe their practical application.

The fall of communist regimes in the late 1980s and early 1990s had a significant impact on the process of democratization in the world, especially in the context of what happened during the "third wave" of democratization. This process began in 1974 in Southern Europe (Portugal, Greece, Spain), and then quickly spread to the countries of Latin America and other regions of the world. Although some researchers in the field of transitology sometimes minimize the influence of democratization on post-communist transformations, it was these states that created the basis for the development of democracy in the world, which caused the rapid retreat of communist regimes and directed the socio-political development of post-communist countries. The majority of post-communist states in their new constitutional acts declared their attachment to the ideals of a free democratic society (McFaul, 2002).

Contrary to popular opinion, S. Levitsky & Lucan A. Way (2023) argue that democracy has shown extraordinary resilience in the twenty-first century. Tendency to pessimistic predictions about a possible retreat or global revival of authoritarianism are still unsubstantiated. Most of the third-wave democracies that



implemented democratic institutions between 1975 and 2000 experienced favorable global conditions that allowed their emergence. The authors examine the resilience of these democracies after the post-Cold War decline of liberal Western hegemony through economic development and urbanization, as well as the challenges of consolidating and sustaining an emerging authoritarian regime in a competitive political environment. According to the international human rights organization "Freedom House", which is considered one of the most reliable platforms on liberal democracy, modern standards of democratic governance include 40 political rights and 60 civil liberties that should be available to citizens, and evaluate a country's progress towards democracy by the number of implemented reforms (Gorokhovskaia, 2023).

In particular, in 2024, Ukraine improved its score from the previous 3.36 to 3.43, which was contributed by such factors as: improvement of the judiciary and independence from 2.25 to 2.50 due to the implementation of legislation that allows the government to fill vacant positions in the Constitutional Courts, as well as the formation of two judicial institutions — the High Council of Justice and the High Qualification Commission of Judges — which unblocked the process of selection and appointment of judges; improvement of anti-corruption measures, which increased the score from 2.25 to 2.50 due to the success of anti-corruption institutions in the fight against systemic corruption in military procurement and mobilization of military personnel (Boyko, 2024).

However, Freedom House (2024) noted that improvements in Ukraine are the result of the government's progress in establishing judicial and anti-corruption bodies, as well as active investigations into bribery, including in the military. The representative of Freedom House, Mike Smeltzer emphasized that: "...Ukraine used the war as an incentive to strengthen democratic processes. Despite the restrictions on human rights due to the conflict, government institutions have improved their performance. The war acted as a catalyst for improving governance in Ukraine in general. It also spurred the government to reform areas that had previously experienced problems, including the judiciary and the fight against corruption. We are seeing modest improvements in these areas, which have historically been at a very low level," he noted.

Within the framework of this study, much attention is paid to the definition of the principles that were developed by domestic scientists. They not only systematized the results of their work taking into account the achievements of other countries, but also developed their own system of principles. In this section, we will focus on those of them that are most important from the point of view of theoretical basis and practical application. For example, A. Kolodiy (2009) characterizes the principles of democratic governance through the concept of good governance, expanding them from the principles and criteria of good governance (organization, rationality, efficiency, openness, accessibility) using the concepts of openness, accessibility (inclusiveness), sensitivity to needs, demands and requests of citizens.

In turn, the connection between globalization and democracy, according to E. Volynets (2009), is revealed in the concepts of democratic governance: active participation of citizens, transparency, together with the right to free access to objective information, responsibility of governments that report on their activity, and the relationship between actions and consequences.

In particular, the processes of the spread of democracy, both on a global scale and in individual countries, are inextricably linked with other global and civilizational movements. Thus, the globalization we mentioned above, which dramatically increased international connections and the speed of information exchange, accelerated the process of adapting the cultural and institutional features of democracy. However, it has also increased the competition between countries for a place in the global system, highlighting the improvement of one's own economic and political systems as an essential condition for survival. In recent years, it has become obvious that globalization and informatization do not always contribute to the development of democratic institutions, especially in countries with insufficient modernization and unstable democratic transition. This has led to crisis phenomena in less developed countries, which increase the tendency for them to separate and increase national self-awareness. These processes and conflicts play a significant role in the modern world, influencing the processes of democratization.



In conflict-prone and post-conflict societies, the path to democracy is fraught with challenges. N.A. Latygina (2011) emphasizes the difficulty of imposing Western models of democracy on non-Western societies, suggesting that each country must develop its own version of democracy that aligns with its cultural and historical context. This assertion becomes particularly relevant when considering regions facing armed conflict or post-war reconstruction.

In these settings, as highlighted by the International Crisis Group (2024), the rebuilding of democratic governance requires not just institutional reforms but also an understanding of the socio-political landscape. The case of Ukraine, which has faced ongoing conflict since Russia's invasion, illustrates the complex interplay between war and democracy. The need for emergency powers has strained democratic principles, yet Ukraine's resilience underscores the potential for democratic endurance even under extreme pressure.

Democracy must prevail over other forms of authoritarian rule. The concept of cosmopolitan democracy considers the institutional and political conditions necessary for effective democratic leadership in states and in relations between them. D. Geld (1995) developed the theory of cosmopolitan democracy, which is based on the principles of a liberal international order, namely on human rights and the rule of law, and defines the construction of a new global constitutional system with firmly established democratic principles. Supporting the "double democratization" of political life, proponents of cosmopolitan democracy seek to strengthen democracy in international relations, extending it to the public sphere of interstate relations. They see transnational democracy and territorial democracy as mutually reinforcing principles of political governance. This model is based on the principle of democratic autonomy, which provides "the right to autonomy within the limits set by the community".

At the same time, in his scientific article "Citizenship Norms and the Expansion of Political Participation", the American political scientist Russell Dalton (2008) examines the features of citizenship and the actions that citizens in democratic countries must perform to support a healthy democracy. Dalton emphasizes the importance of citizen participation in the political process, arguing, "Until citizens are involved in public policy discussions and their choices influence government actions, democratic processes remain meaningless." Dalton considers several responsibilities of citizens in a democratic system: to be aware of the activities of authorities in order to actively participate in management; join democratic debates and policy discussions with other citizens, and ideally, understand others' positions; maintain social order and recognize the authority of the state (respect for the rule of law); bear ethical and moral responsibility to others, both within the state and beyond.

Thus, in their work "The type of citizen: strategies for educating citizens for democracy", the J. Westheimer & J. Kahne (2004) consider three types of citizenship: a personally responsible citizen, a participating citizen, and a citizen who puts justice first. Individuals belonging to each of these categories have differences in their behavior. For example, a personally responsible citizen obeys laws, contributes to the improvement of public space (for example, by cleaning up litter), and helps others on a voluntary basis. Participatory citizens are actively involved in public affairs at the local or national level, while justice-oriented citizens are concerned with combating the social, economic, and political factors that lead to oppression and inequality. Thus, citizen participation in democracy is critical to ensuring the stability and development of society. However, under martial law, democratic processes can be limited and social transparency reduced. This can lead to an attempt to replace the values of democracy with reduced forms of populism and temporary solutions to tactical tasks. Therefore, it is important to provide a systematic analysis of democratic governance in the conditions of military conflict and develop strategies that guarantee the preservation and development of democratic values in society, even in the most difficult times.

In addition to the above, Doctor of Public Administration P.M. Petrovskyi (2023) emphasizes that the modern democratic development of Ukrainian society is primarily considered as a trend. In particular, the scientist found that democratic development in the sphere of public administration in Ukraine requires the interaction of the main social actors who consciously adhere to the principles of the democratic paradigm. The complexity of implementing this paradigm is due to the diversity of democracy and the need to systematically



take into account many of its aspects in the context of confronting totalitarian threats to the progressive development of society.

At the same time, different methods are used in sociological studies to determine the level of support for democracy among citizens. One of these methods is the assessment of citizens' satisfaction with the level of democracy, or the assessment of the compliance of the existing political system with democratic standards using a scoring system. The ability of the respondents to influence the authorities is also evaluated. It is important to note that these indicators can reflect not only the real level of development of democracy, but also the general state of mass consciousness, which often depends on the socio-economic situation (Onuch, 2022).

The words of the professor of constitutional law at the New York University Law School, Issacharoff, S. (2022), are quite apt, regarding the fact that Ukrainian constitutional law recognizes the need for exceptional powers during a state of emergency, just like any other constitutional order directly or tacitly. A war for survival necessarily transfers power from parliament to the executive, and many fundamental principles of democracy can be suspended during an emergency, even such defining features of democracy as popular choice of government.

Note that the quality of democracies around the world is declining, and political crises and conflicts are intensifying in several regions. In this context, democracy and governance assistance is becoming increasingly complex and extremely important. Thus, in conflict and post-conflict transition environments, weakened institutions, political upheaval, social divisions and discontent, and security threats often impede efforts to build or restore democracy and effective governance. Although the COVID-19 crisis led to several ceasefires in early 2020, armed conflicts are still on the rise around the world. This is why it is critical for donors and implementers to understand how to better support partners in these contexts, optimize and adapt resources, or improve existing and future programs.

According to Richard Gowan (2023), a UN expert at the International Crisis Group, 2022 was a year of widespread armed conflict around the world, with the variety and level of violence varying greatly between regions. The situation in Ukraine dominated the discussion of war and peace, but it was the only example of a major interstate war involving standing armies during the year. At the same time, Russia's invasion of Ukraine threatened to increase global instability in 2022 by undermining food and energy markets and undermining mechanisms for resolving international conflicts. However, the effects of the war were more muted than it seemed at first.

According to data provided by ACLED (the leading source of real-time data on political violence and protest activity worldwide), the armed conflict index for 2024 assesses the level of conflict according to four key indicators: mortality, danger to civilians, geographical spread of conflict and fragmentation of armed groups. According to the project, of the 50 countries represented, Myanmar is the most violent overall and maintains its position as the most "fragmented" thanks to hundreds of small armed groups formed to fight the government after the 2021 coup. Syria is the second most conflict-ridden country due to the multiple, overlapping conflicts that continue to occur within its borders. The conflict in Palestine covers almost its entire territory, so it is considered the most "diffuse" conflict. Palestine's position has risen since the last Index, thanks entirely to the large and deadly war with Israel, which was mainly fought in Gaza. Mexico continues to be the most dangerous country for its citizens, as they are directly targeted by the cartels in their brutal competition. Ukraine remains the deadliest, as both Ukrainian and Russian armies have lost tens of thousands of soldiers (ACLED Data, 2024).

Thus, in January 2023, mass protests erupted in Israel against the reforms proposed by the right-wing government aimed at reorganizing democratic structures in the country. These reforms reflected institutional changes similar to those used by populist right-wing parties in Hungary and Poland to steer their countries away from liberal democracy. The proposed reforms, which would have concentrated power in the hands of the executive branch and weakened the judiciary, sparked protests across the country. These protests, in



turn, led to a halt to the planned changes. This was stated by N. Gidron, stressing that the analysis shows that the erosion of democracy is caused by conservative elites, not far-right parties. The center-right Likud party displays some populism, but its voters largely do not reject liberal democratic values. This case in Israel highlights the need to consider the positions of both the masses and the elites, and calls into question traditional distinctions in understanding the trend of retreat from democratic principles (Gidron, 2023).

The International Crisis Group states its vision for the rapid flow of conflicts in 2020 and the maximum possible preservation of democratic governance in warring countries. Russia's war in Ukraine continues with no resolution on the horizon. But while Ukraine's fortunes have not improved over the past twelve months, Kyiv shows no signs of buckling under Russian pressure. In starting to build a more stable European security architecture for the future, the EU and its member states should:

- To help Ukraine rebuild and sustain its economy by approving a €50 billion aid package to be delivered to the bloc on February 1, which includes funding to support the institutional reforms needed to strengthen the country's EU candidacy and investment guarantees aimed at attracting additional funding for Kyiv;
- Ensure long-term financing of military supplies to Ukraine and revive European arms production. The EU and Member States must ensure that EU industry receives the commitments it needs to increase production now and in the future;
- Adapt training programs provided through the EU Military Assistance Mission to Ukraine to the realities of combat, making them more sensitive to Ukrainian feedback and tactical innovations and including more non-military support for veterans;
- Support the revival of the Ukrainian export economy through measures to promote trust and goodwill between Ukrainian farmers and transporters and their competitors in EU border states, including through financing customs and improving infrastructure to reduce border congestion;
- To keep open the possibility of negotiations both between Ukraine and Russia regarding a peace agreement, and between themselves, Washington and Moscow regarding European security. In the meantime, economic and security support for Ukraine could make viable diplomacy more likely and any eventual deal more sustainable (International Crisis Group, 2024).

In particular, the International Electoral Systems Foundation's document "Overcoming Challenges to Democracy and Governance Programs in Post-Conflict Countries: CEPPS Lessons Learned" provides recommendations based on more than 25 years of programs implemented by the Consortium for Electoral and Political Enhancement (CEPPS) in 18 countries. Thus, the document notes the fact that it is easier to implement complex programs and achieve positive results in post-conflict conditions where the physical safety of implementers and beneficiaries is not at high risk. However, when security risks are widespread, policymakers must carefully assess what actions are feasible and narrow the scope of programs to focus resources on what can realistically be achieved, in particular, such attempts at democratic governance are suggested as: maintaining effective and informed voter participation in the electoral process, encouraging transparent and accountable elections by building strong institutions, strengthening citizen participation in the electoral process, etc., on the example of such warring countries as: Afghanistan, Angola, Bosnia and Herzegovina, Burundi, the Central African Republic, the Democratic Republic of the Congo, Georgia, Guatemala, Indonesia, Liberia, Myanmar, Nepal, Nigeria, Nigeria, Russia, Peru, Sierra Leone, Ukraine, Sri Lanka, etc. Overcoming Challenges to Democracy and Governance Programs in Post-Conflict Countries: CEPPS Lessons Learned (International Foundation for Electoral Systems, 2021).

It is important to remember, that education plays a crucial role in the evolution and sustainability of democracy. Democratic education aims to foster a politically active, informed, and responsible citizenry. It involves teaching the principles of democracy, civic responsibility, and critical thinking.

1. **Civic Education:** Civic education encompasses knowledge about political processes, the structure of government, and the rights and responsibilities of citizens. It equips individuals with the understanding necessary to participate effectively in democratic processes.



2. **Critical Thinking and Debate:** Democracy thrives on informed debate and critical thinking. Educational systems must encourage students to think critically about political issues, engage in reasoned debates, and evaluate different perspectives.
3. **Ethical Responsibility:** Education instills ethical values and responsibility, encouraging students to act with integrity and respect for others. These values are foundational for maintaining a just and equitable society.
4. **Active Participation:** Schools and universities play a crucial role in promoting active participation in democratic processes. This includes involvement in student councils, community service, and other forms of civic engagement.
5. **Global Citizenship:** In an increasingly interconnected world, education should also foster a sense of global citizenship. Understanding global issues and the impact of globalization on democracy prepares individuals to address complex challenges and contribute to global democratic governance.

The global decline in democratic quality and the rise of authoritarianism pose significant threats to the future of democracy. Yet, as history has shown, democracy is an adaptable and resilient system. To safeguard its future, nations must prioritize civic engagement, uphold the rule of law, and promote education that fosters critical thinking and ethical responsibility. Furthermore, the international community must continue to support democratic transitions in post-conflict societies, ensuring that democracy remains a viable and sustainable form of governance, even in the most challenging circumstances. By examining these historical and contemporary dynamics, we gain a deeper understanding of democracy as a complex and evolving system. Its success depends not only on institutional structures but also on the active participation and commitment of its citizens.

Conclusions

The results of this study highlight the critical role democratic governance plays in maintaining stability, protecting citizens' rights, and mobilizing society's resources during times of war. Specifically, openness, transparency, and accountability in government structures are essential components of successful crisis management. Democratic governance, by fostering public influence and cooperation between national and international bodies, enables more effective responses to humanitarian crises. These findings contribute to the existing knowledge about socialization in the computerized educational space by emphasizing how digital platforms and tools can foster civic engagement and democratic values, especially in crisis situations. The digital environment enables greater transparency, public involvement, and coordination, which are essential for sustaining democracy in challenging times. This highlights how the computerized educational space can be harnessed to support democratic governance, even in the most difficult periods.

Practical Implications

For educators, policymakers, and parents, the findings of this study underscore the importance of integrating democratic values into educational frameworks, particularly in the context of the computerized educational space:

For Educators: The study suggests a stronger emphasis on civic education and critical thinking in digital learning environments. Teachers should encourage students to engage in political discussions, participate in virtual debates, and understand how democratic governance functions in times of crisis. Interactive and collaborative online tools can help students develop the skills necessary to be informed, active citizens.

For Policymakers: Policymakers should focus on creating policies that ensure digital platforms used in education promote democratic values. This includes safeguarding access to reliable information, encouraging civic participation through digital tools, and ensuring transparency in educational governance.



For Parents: Parents play a key role in guiding their children's understanding of civic responsibility. The study suggests that parents should actively engage with their children's use of digital platforms, helping them navigate political discussions and encouraging critical thinking about the information they encounter online.

Future Research Directions

This study has some limitations, particularly in the scope of its investigation into the computerized educational space during wartime conditions. Future research could explore the following areas:

Longitudinal Studies: Examining the long-term effects of democratic governance education in the digital space on students' civic engagement and political participation could provide valuable insights into how early digital socialization influences later democratic behaviors.

Cross-National Comparisons: Future research could compare the effectiveness of democratic governance education in the digital space across different countries, particularly those with varying levels of democratic maturity or facing different types of crises.

Technological Tools and Platforms: More in-depth studies are needed to explore which digital tools and platforms are most effective in promoting democratic values and civic engagement among students.

Final Reflection

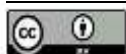
In the contemporary educational context, the importance of fostering democratic values through education—particularly in the digital space—cannot be overstated. As societies become increasingly interconnected and reliant on technology, the computerized educational space presents both opportunities and challenges for cultivating informed, engaged, and responsible citizens. The findings of this study reinforce the importance of integrating democratic governance principles into education, particularly in times of crisis, to ensure that future generations are equipped to uphold and strengthen democracy. Education, in this context, is not merely a means of imparting knowledge but a powerful tool for sustaining the democratic fabric of society, even in the most turbulent times.

Bibliographic references

- ACLED Data. (2024). *Conflict Index*. Retrieved from: <https://acleddata.com/conflict-index/>
- Bellamy, R. (2006). *Constitutionalism and Democracy*. London: Routledge. Retrieved from: <https://acortar.link/PsulsE>
- Bevir, M. (2010). *Democratic Governance*. Princeton: Princeton University Press, 320. Retrieved from: <https://press.princeton.edu/books/paperback/9780691145396/democratic-governance>
- Boyko, N. (2024). *Score changes in 2024*. Freedom House. Retrieved from: <https://freedomhouse.org/country/ukraine/nations-transit/2024>
- Freedom House. (2024). *Countries and Territories*. Retrieved from: <https://freedomhouse.org/countries/nations-transit/scores>
- Fukuyama, F. (1995). *Trust: The Social Virtues and the Creation of Prosperity*. New York: Free Press. Retrieved from: <https://www.jstor.org/stable/20752121>
- Geld, D. (1995). *Democracy and Global Order: From The Modern State to Cosmopolitan Governance*. Cambridge: Polity Press. Retrieved from: <https://acortar.link/dX3OLM>
- Gidron, N. (2023). Why Israeli Democracy Is in Crisis. *Journal of Democracy*, 34(3), 33-45. Retrieved from: <https://www.journalofdemocracy.org/articles/why-israeli-democracy-is-in-crisis/>
- Golovaty, M.F. (2022). Political and civilizational discourse of democracy. *Scientific works of the Interregional Academy of Personnel Management Political Science and Public Administration*, 1(59), 21-29. Retrieved from: <https://journals.maup.com.ua/index.php/political/article/view/1268>



- Gorokhovskaia, Y., Shahbaz, A., & Slipowitz, A. (2023). The Freedom House Survey for 2022: A Turning Point for Global Freedom? *Journal of Democracy*, 34(2), 105-119. Retrieved from: <https://muse.jhu.edu/article/886936>
- Gowan, R. (2023). *Trends in armed conflicts*. Stockholm: Stockholm International Peace Research Institute Yearbook. Retrieved from: <https://www.sipri.org/yearbook/2023/02>
- Graham, J., Amos, B., & Plumptre, T. (2003). Principles for Good Governance in the 21st Century. *Institute on Good Governance*, 15, 1-6. Retrieved from: https://www.academia.edu/2463793/Principles_for_good_governance_in_the_21st_century
- Hendriks, F. (2021). Key Values for Democratic Governance Innovation: Two Traditions and a Synthesis. *Public Administration*, 100(1), 803-820. Retrieved from: <https://onlinelibrary.wiley.com/doi/full/10.1111/padm.12738>
- Hrytsyak, N.V. (2012). *Ethical principles of democratic governance: mechanisms of formation and implementation*. Ivano-Frankivsk: Ivano-Frankivsk National Technical University of Oil and Gas. Retrieved from: <http://elar.nung.edu.ua/bitstream/123456789/1833/1/an2283.pdf>
- Humen, Y. (2023) Democratic governance: conceptualization of foreign experience, analysis of the key theories and concepts. *Socio-Economic Problems and the State (electronic journal)*, 28(1), 17-29. Retrieved from: <https://elartu.tntu.edu.ua/handle/lib/42446>
- Huntington, S.P. (1993). *The Third Wave: Democratization in the Late Twentieth Century*. Oklahoma: University of Oklahoma Press. Retrieved from: <https://archive.org/details/thirdwavedemocra0000hunt>
- International Crisis Group. (2024). *Watch List*. Retrieved from: <https://www.crisisgroup.org/global/watch-list-2024>
- International Foundation for Electoral Systems. (2021). *Overcoming Challenges to Democracy and Governance Programs in Post-Conflict Countries: CEPPS Lessons Learned*. Retrieved from: <https://acortar.link/OVjalj>
- Issacharoff, S. (2022). *Democracy Under Total War. Verfassungsblog on matters constitutional*. Retrieved from: <https://verfassungsblog.de/democracy-under-total-war/>
- Kolodiy, A. (2012). The concept of public (new) governance in its application to democratic and transitional systems. *Democratic Governance*, 10, 1-12. Retrieved from: <https://science.lpnu.ua/sites/default/files/journal-paper/2022/feb/26864/kolodij.pdf>
- Kolodiy, A. (2009). *Concepts of democratic governance as a direction of political and management research*. Lviv: Law. Retrieved from: https://political-studies.com/wp-content/uploads/2010/01/2009_LRIDU-conf_Plenarne1.pdf
- Latygina, N.A. (2011). Conceptualization of democracy. *Economic journal-XXI*, 7(8), 3-6. Retrieved from: <https://harvester.nas.gov.ua/Record/irk-123456789-47825>
- Levitsky, S., & Lucan, A.W. (2023). Democracy's Surprising Resilience. *Journal of Democracy*, 34(4), 5-20. Retrieved from: <https://www.journalofdemocracy.org/articles/democracys-surprising-resilience/>
- McFaul, M. (2002). The Fourth Wave of Democracy and Dictatorship: Noncooperative Transitions in the Postcommunist World. *World Politics*, 54(2), 212-244. Retrieved from: <https://www.jstor.org/stable/25054183>
- Nikolina, I.I., & Merezhko, V.M. (2022). Theoretical aspects of building good governance at the local level. *Academic notes of TNU named after V.I. Vernadskyi. Series: Public management and administration*, 33(72), 133-137. Retrieved from: https://pubadm.vernadskyjournals.in.ua/journals/2022/6_2022/20.pdf
- Onuch, O. (2022). Why Ukrainians Are Rallying Around Democracy. *Journal of Democracy*, 33(4), 37-46. Retrieved from: <https://www.journalofdemocracy.org/articles/why-ukrainians-are-rallying-around-democracy/>
- Petrovskyi, P.M. (2023). The democratic trend in the development of the public management sphere of Ukraine in the post-war period. *Democratic governance*, 1(31), 1-12. Retrieved from: <https://science.lpnu.ua/sites/default/files/journal-paper/2023/jun/30655/230940verstka-5-15.pdf>



- Pettai, V. (2022). *Post-Communist Democracies in Decline? Estonia and Poland Compared. Challenges to Democracy in the 21st Century*. Springer. Retrieved from: https://link.springer.com/chapter/10.1007/978-3-031-09123-0_11
- Reshota, O.A. (2011). *The concept of democratic governance in the governance reform of the European Union*. Lviv: LRIDU NADU.
- Romanyuk O.I. (2010). The origin of democracy as a significant factor in the establishment of democratic regimes. *Bulletin of Kharkiv National University named after V.N. Karazin. Series: Questions of political science*, 885(16), 55-62. Retrieved from: <https://periodicals.karazin.ua/politology/article/download/3249/2823/>
- Russell, J.D. (2008). Citizenship Norms and the Expansion of Political Participation Political Studies. *Political Studies*, 56(1), 76-98. Retrieved from: <https://journals.sagepub.com/doi/10.1111/j.1467-9248.2007.00718.x>
- Savrikar, N. (2016). *What is the importance of good governance?* Quora. Retrieved from: <https://www.quora.com/What-is-the-importance-of-good-governance>
- Snegovaya, M. (2023). Why Russia's Democracy Never Began. *Journal of Democracy*, 34(3), 105-118. Retrieved from: <https://www.journalofdemocracy.org/articles/why-russias-democracy-never-began/>
- Volynets, E.S. (2009). Regional strategies as factors of democratic governance in Ukraine. Democratic governanc. *Kyiv National Academy of Sciences*, 2, 281-283. (In Ukrainian)
- Westheimer, J., & Kahne, J. (2004). What Kind of Citizen. The Politics of Educating for Democracy. *American Educational Research Journal*, 41(2), 237-269. Retrieved from: <https://www.jstor.org/stable/3699366>
- Zozulya, V.O. (2017). Principles of democratic governance in the conditions of globalization. *Investments: practice and experience*, 18, 108-112. Retrieved from: <http://www.investplan.com.ua/?op=1&z=5710&i=21>



DOI: <https://doi.org/10.46502/issn.1856-7576/2024.18.03.22>


Cómo citar:

Oliinyk, I., Bulavina, O., Romanenko, T., Tatarnikova, A., & Smirnov, A. (2024). Artificial intelligence in developing doctoral students' research competencies. *Revista Eduweb*, 18(3), 294-305. <https://doi.org/10.46502/issn.1856-7576/2024.18.03.22>

Artificial intelligence in developing doctoral students' research competencies


Inteligencia artificial en el desarrollo de competencias de investigación de estudiantes de doctorado

Iryna Oliinyk

 <https://orcid.org/0000-0002-1749-1518>
econ.biss22@gmail.com


Department of Innovative Technologies in Pedagogy, Psychology and Social Work, Alfred Nobel University, Dnipro, Ukraine.

Olena Bulavina

 <https://orcid.org/0000-0002-0198-1838>
bulavina.olena211@kneu.edu.ua


Department of Pedagogy and Psychology Personnel Management, Sociology and Psychology Faculty, State Higher Educational Institution "Kyiv National Economic University named after Vadym Hetman", Kyiv, Ukraine.

Tetiana Romanenko

 <https://orcid.org/0000-0002-9790-2718>
tanya.romanenko27@gmail.com


Department of Automation and Computer-Integrated Technologies of the Bohdan Khmelnytsky National University of Cherkasy, Cherkasy, Ukraine.

Anzhelika Tatarnikova

 <https://orcid.org/0000-0002-6310-8276>
angelika.tatarnikova86@gmail.com

Department of Art Studies and General Humanitarian Disciplines, Faculty of Art and Design, International Humanitarian University, Odessa, Ukraine.

Anton Smirnov

 <https://orcid.org/0000-0002-1562-4591>
anton.s.agro35@ukr.net

Kharkiv Institute of Medicine and Biomedical Sciences, Kharkiv, Ukraine.

Recibido: 10/08/24

Aceptado: 28/09/24

Abstract

The study deals with the topical issue of introducing artificial intelligence (AI) into the students' professional training at the third educational and research level of higher education. The aim of the study is to empirically verify the AI role in building the research competence of future doctors of philosophy (PhDs). The research employed the following methods: monitoring, quantitative, qualitative, comparative data analysis, modelling. The study involved monitoring the development of the students' research competence of the third educational and research level of higher education according to substantive, design, procedural,



optional, communicative components. The method of using AI in building the research competence of PhD students was developed and tested. The level of research competence increased during the implementation of the method of using AI. So, the growth was the following: substantive – by 7.5%, design – by 10%, procedural – by 8.4%, optional – by 11.4%, and communicative – by 8.5% components. The results of the study can be used in the educational process of higher education institutions (HEIs) to create the content of the training of applicants. The prospect of research is the development of recommendations regarding the use of AI tools in the development of their research skills.

Keywords: academic degree students, academic research, artificial intelligence, higher education institutions, postgraduate studies.

Resumen

El estudio aborda el tema de actualidad de la introducción de la inteligencia artificial (IA) en la formación profesional de los estudiantes del tercer nivel educativo y de investigación de la educación superior. El objetivo del estudio es verificar empíricamente el papel de la IA en el desarrollo de la competencia investigadora de los futuros doctores en filosofía (PhD). La investigación empleó los siguientes métodos: seguimiento, cuantitativo, cualitativo, análisis de datos comparativos, modelización. El estudio implicó monitorear el desarrollo de la competencia investigativa de los estudiantes del tercer nivel educativo e investigativo de la educación superior según los componentes sustantivo, de diseño, procedimental, optativo y comunicativo. Se desarrolló y probó el método de utilizar la IA para desarrollar la competencia investigadora de los estudiantes de doctorado. El nivel de competencia en investigación aumentó durante la implementación del método de uso de la IA. Así, el crecimiento fue el siguiente: componentes sustantivos (7,5%), de diseño (10%), procesales (8,4%), opcionales (11,4%) y comunicativos (8,5%). Los resultados del estudio pueden utilizarse en el proceso educativo de las instituciones de educación superior (IES) para crear el contenido de la formación de los aspirantes.

Palabras clave: estudiantes de grado académico, estudios de posgrado, instituciones de educación superior, inteligencia artificial, investigaciones académicas.

Introduction

In recent years, AI tools have been actively implemented in many types of human activity. It is the leading modern trend. It makes it possible to simplify routine processes and procedures, save the intellectual potential of specialists of modern enterprises and direct it to other more productive areas of activity. AI is considered as an auxiliary tool, a way to optimize human activity. Attitudes toward the use of AI tools in certain areas of human activity range from positive to sharply negative. In particular, the appropriateness of using AI tools in educational institutions is quite controversial, because it often leads to a violation of the academic integrity of all participants in the educational process. This negatively affects domestic academic research, calls into question their authorship, reliability, etc. But AI is a powerful digital innovation of today. Its potential can be used in conducting academic research without violating the rules of academic integrity. It is clear that it is difficult to track the facts of students' use of AI tools when they perform various types of tasks in modern conditions of learning in mixed and distance formats. Everything depends on the students' conscious attitude towards mastering the major. But at different levels of education, the level of students' conscious attitude to the results and content of education is different. In particular, this applies to the academic degree students engaged in research activities, for example, PhD students. The use of AI tools in their activities speeds up the process of finding the necessary information. AI makes it possible to quickly summarize the intermediate results of the research, annotate the selected studies. AI generates probable programmes of individual studies, determine algorithmic procedures for conducting independent studies. It is also possible to outline clear boundaries of research in the chosen direction through the use of AI. These are the areas of research for which there is no risk of violating academic integrity. Research hypothesis: the use of AI contributes to increasing the level of research competence of PhD students.



The aim of the research is to determine the AI role in building the research competence of PhD students. The aim involves the fulfilment of the following research objectives:

- Study the current level of the research competence of PhD students;
- Develop a method of using AI in the building the research competence of PhD students;
- Determine the effectiveness of using AI in building the research competence of PhD students;
- Identify the achieved level of research competence of PhD students.

Literature Review

The training of future scientists, scholars and academicians, in particular PhDs, should comply with the requirements for the quality of education and the achievement of the sustainable development goals (SDGs) of Ukraine. They provide for ensuring the quality of education and science, establishing partnerships in the field of education and science, and introducing innovations (Artyukhov et al., 2022). A variety of innovations are being actively implemented in the modern education and science through total digitalization. One of such innovations is AI tools, which are actively being implemented in educational and scientific practice. Although the period of introduction of AI is insignificant, a contradictory attitude of the scientific and pedagogical communities towards this newest tool was formed. Modern researchers note the negative aspects of the AI use in the training of higher school students. In particular, this is a negative impact on cognitive processes, non-observance of the necessary experience of independent performance of professional tasks by higher school students. It is also excessive use of virtual teaching by the teaching and academic staff, lack of empathy in interpersonal interaction between teachers and students (Galushko & Batmanghlich, 2023). The introduction of AI significantly affects the management of personnel potential not only of an educational institution, but also of any enterprise, institution, and organization. Therefore, it is advisable to use the achievements of AI in the management of the company's human resources (HR). The teaching staff is considered one of the main resources for achieving operational goals, high productivity and the mission of the educational institution in general (Oleynik & Das, 2023). Researchers also point to the empirically proven effectiveness of the AI use in achieving progressive dynamics of development of research competence of PhDs (Almaraz-López et al., 2023; Oliinyk et al., 2024).

PhD students can successfully use AI tools for text generation, data analysis and interpretation, literature review, formatting and editing, peer review (Alqahtani et al., 2023). The researchers study the AI role in the educational process of a higher education institution (HEI) in the context of the attitude of graduate students and teachers to it, the development of management structures and academic culture (Jafari & Keykha, 2024). Some researchers call its use as a platform for personalized learning, ensuring interactive communication between subjects of the educational process (Chen et al., 2023; Zhou, 2023) an absolute advantage of AI in the educational field. In order to eliminate the negative impact of AI on the educational process, in particular on the violation of academic integrity, researchers suggest developing a clear institutional policy for higher education (Spivakovsky et al., 2023). Machine learning is a positive example of the educational and research practice of using AI (Teng, Zhang & Sun, 2023). In general, studies confirm the benefits of using AI for the development of various areas of human activity, in particular for business development, knowledge management (Chen, 2023). ChatGPT is one of the most common AI tools in higher education and education in general. In particular, its effectiveness in teaching programming, developing algorithmic thinking, cooperativeness, critical thinking, etc. was empirically proven (Yilmaz & Yilmaz, 2023). Some researchers allow the possibility of using ChatGPT for students to perform tasks with their subsequent editing (Ibrahim et al., 2023; Farrelly & Baker, 2023). The researchers emphasize the high probability of students using AI, in particular GPT, to distort educational results and deceive academic and teaching staff (Malinka et al., 2023).

However, the use of AI is quite appropriate when building virtual reality simulations. This makes it possible to increase the level of students' professional skills (Liaw et al., 2023; Mousavi Baigi et al., 2023). The above confirms the contradiction of such a phenomenon as AI, but does not exclude the possibility of its competent use in higher education. The training of graduate students in different universities of the world



is also characterized by a number of challenges. This is the devaluation of students' participation in scientific/academic representative events, the consideration of research supervisors of dissertations as facilitators of their academic publications (Horta & Li, 2023). At the same time, an important aspect of the training of future scientists/scholars/academicians is the development of their research competence, the correlates of which are the academic atmosphere in the educational institution, the innovative ability of graduate students. Therefore, the efforts of HEIs should be directed to increasing the efficiency of the research, to solving the problem of low innovative capacity of graduate students (Han et al., 2024). The innovative capacity of graduate students depends on the development of their research and digital skills. They are progressively developing and constitute a solid foundation for building further studies (Galushko & Batmanghlich, 2023; Ochoa-Tataje et al., 2024).

AI plays a significant role in the formation of research competence of PhD students. It provides quick access to any information resources, enables processing large data sets. AI is used to create algorithms, build virtual models of the research. AI personalizes education taking into account the students' needs, interests and research orientation. It enables the exchange of research ideas, automatic verification and correction of author's texts (Oliinyk, 2024; Yilmaz & Yilmaz, 2023). Research competence is interpreted as a complex personal and professional property. It is manifested in the ability to conduct academic research, motivation for research activity, in understanding the specifics of the research, the ability to generate and implement new ideas into practice. The use of AI tools in the formation of research competence of future scientists/scholars/academicians, in particular PhDs, makes it possible to automate certain directions and stages of academic research (Zhytomyrska, 2024). The components of research competence of PhD students include substantive, design, procedural, optional, and communicative (Riabets, 2023).

The analysis of the studies on the AI use in the training of PhD students confirms the appropriateness of its use. But the main condition is the observance of humanistic principles, ethical criteria and norms of justice (Melnykova, 2023). They are related to the concept of academic integrity defined in Article 42 of the Law of Ukraine (Law of Ukraine No. 2145-VIII, 2017). Researchers emphasize the importance of forming an virtuous educational and research space, which is important during the post-war reconstruction of Ukraine (Shablysty, 2023). And adherence to the principles of academic integrity is an important prerequisite for creating such an environment (Pokotylo & Sylkina, 2023). The introduction of AI tools has a positive effect on the companies' activities as a whole, as it will increase the amount of time for solving strategic tasks (Snopenko, 2021). The AI use will contribute to the development of company's effective HR management strategies (Korolevska, 2023). In general, the studies on the issue under research emphasizes the prerogatives of using AI in building the research competence of PhD students. However, most of the studies search for effective practices in the AI use in the preparation of students at the first and second levels of higher education. The possibilities of AI in building of the of research skills of future graduate students and doctoral students remain unexplored. Possible areas of AI use of building the research skills of PhD students require further studies.

Methods and materials

Research design

The research was conducted in order to determine the AI role in building the research competence of PhD students. It consisted of the following stages: organizational, methodological, empirical, and final. The organizational stage involved determining the aim and objectives of the research and the sampling. At the methodological stage, the author's tools for interviewing respondents were developed. The empirical stage of the study involved determining the current and achieved levels of research competence of PhD students. It also provided for the development and verification of the effectiveness of the method of using AI in building the research competence of PhD students, analysis, interpretation of the obtained empirical data. At the final stage of the research, its results were summed up, conclusions were drawn, and areas for further research were determined.



Sampling

The research involved PhD students of Bohdan Khmelnytsky National University of Cherkasy and Alfred Nobel University. The survey covered 78 (38 – control group (CG), 40 – experimental group (EG)) PhD students. During the formation of the research sample, we were guided by the goal of covering research among PhD candidates to study the AI role of in the formation of research competence of PhD students. The sample included all respondents from the above-mentioned educational institutions who are PhD students and who agreed to participate in the study. The sample size is sufficient for conducting an empirical study at two HEIs. The level of development of the research competence of PhD students, the attitude of the subjects of the educational process to the AI use was taken into account during the research. The survey was conducted using Google Forms. The primary data were processed in Excel spreadsheets.

Methods

The research methods are: monitoring of the current and achieved level of the research competence of PhD students, quantitative, qualitative and comparative analysis of empirical data, modelling. Monitoring involved determining the level of research competence of PhD students. The development of research competence of third-level higher school students was monitored according to each of its components: essential, design, procedural, optional, communicative. The characteristics of each of the components are presented in Table 1.

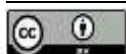
Table 1.
Structure of research competence of PhD students

Component	Characteristics
Substantive	The ability of the third-level higher education students to analytically evaluate their research activity
Design	The ability of the third-level higher education students to determine the appropriateness of methods, techniques and means of planning and conducting individual research
Procedural	The ability of the third-level higher education students to search for various information data from various sources, understanding the possibility of their use within the scope of individual research
Optional	The ability of the third-level higher education students to manage the research process with an orientation towards a satisfactory final result, motivation to conduct further research
Communicative	Acquisition of new and expansion of existing professional contacts by the third-level higher education students, development of skills to analyse the relevance of their research and predict its scale

Source: compiled by the author based on (Riabets, 2023).

Quantitative, qualitative and comparative analysis of empirical data was carried out on the basis of processing the questionnaire data. The modelling method was used during the development of the method of using AI in the development of research competence of PhD students.

The author's questionnaire (Appendix A) was used to monitor the development of the research competence of future PhDs. It provides only 20 statements for each of the components of research competence. 1 point is awarded for each affirmative answer. The number of points for each of the components and as a whole is calculated. The levels of development of research competence of future PhDs are determined: high – 16-20 points, medium – 14-10 points, low – 9 or less points. Cronbach's alpha was used to determine the reliability of the author's questionnaires (Cronbach's alpha value – 0.88).



Results

At the empirical stage of the study, the development of the research competence of PhD students was monitored. The monitoring results are presented in Table 2.

Table 2.

Monitoring of the current level of research competence of PhD students, %

Criterion	CG	EG
Substantive	39.5	42.5
Design	52.6	52.5
Procedural	28.9	32.5
Optional	21.1	22.5
Communicative	23.7	25
Mean	33.2	35

Source: created by the author based on survey data of respondents

Table 2 shows that the current level of research competence in third-level higher school students of the CG and EG is the highest for the design and substantive components. This indicates that future PhDs have developed the ability to analytically evaluate their research activities, to determine the appropriateness of methods, techniques and means of planning and conducting individual research. Less developed is the research competence of third-level higher school students in terms of procedural, optional, and communicative components. This gives grounds for asserting that PhD students lack the ability to search for various information from various sources and understand the possibility of their use in academic research. PhD students have a reduced ability to manage the research process with an orientation towards a satisfactory end result. PhD students are not sufficiently motivated to conduct further research; to establish new and expanding existing professional contacts. They need to develop skills to analyse the relevance of their academic research and predict its scale.

The conducted empirical research gave grounds to develop a method of using AI in building of research competence of PhD students. The directions of using AI in this method include the search for information on various resources, the creation of annotated catalogues of works on the issue being studied, and the construction of virtual models of academic research. The method also takes into account the possibility of using AI for the creation of research algorithms, the development of personalized training courses, and the exchange of research ideas. The method also involves the AI use for correlation analysis of empirical data, automatic verification and correction of authored academic texts. These are the areas of AI use that do not contradict ethical norms and do not violate the academic integrity principles. The method of using AI in building the research competence of PhD students is presented in Table 3.

Table 3.

The method of the AI use in building the research competence of PhD students

Areas of AI use	Professional tasks for PhD students
Search for information on various resources	Create a source base on the issue under research using AI (300 sources)
Creation of annotated catalogues of works on the issue under research	Create an annotated catalogue of works related to the issue under research (150 studies) using AI
Construction of virtual models of academic research	Generate a model of academic research using AI. Build a model of academic research independently. Compare the results, draw conclusions
Formation of scientific research algorithms	Generate an algorithm for conducting academic research on a selected topic with full details of its stages using AI
Development of personalized training courses	Develop a model of a special course on the issue under research for 20 hours using AI, adjust the generated course content



Exchange of research ideas	Prepare a letter to the publishing house with a request to publish an academic article prepared on the issue under research with a full justification of the achieved results. Translate the text of the letter into a foreign language, generate an annotation to the prepared article in a foreign language with the help of AI.
Carrying out correlation analysis of empirical data	Use AI to calculate Spearman correlation coefficients based on empirical research data, independently provide an interpretation of correlation relationships based on the obtained calculations data
Automatic verification and correction of authored academic texts	Check the text of an academic article prepared on the issue under research using AI

Source: created by the author based on the results of empirical research

This research also involved monitoring the achieved level of research competence of PhD students. It was conducted after the introduction of our proposed method of using AI in building the research competence of PhD students. Monitoring data on the achieved level of research competence of PhD candidates is presented in Table 4.

Table 4.

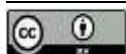
Monitoring of the achieved level of research competence of PhD students, %

Criterion	CG	EG
Substantive	42.1	50
Design	52.6	62.5
Procedural	31.6	45
Optional	21.1	32.5
Communicative	26.3	35
Mean	34.7	45

Source: created by the author based on survey data of respondents

Table 4 shows qualitative changes that after the implementation of our proposed method of using AI in building the research competence of PhD students of the EG. In particular, the achieved level of research competence is best formed by procedural, design, and substantive components. This indicates that PhD students have developed the ability to analytically evaluate their research activities. They also developed the ability to determine the appropriateness of methods, techniques and means of planning and conducting individual research; search for various information from different sources. PhD students are also characterized by an understanding of the possibility of using the information they have developed within the scope of individual academic research. The research competence of PhD students is less developed for optional and communicative components. This indicates a less developed ability to manage the research process towards a satisfactory final result. The data also indicate that they are insufficiently motivated to conduct further research; to establish new and expanding existing professional contacts. PhD students need to develop the skills to analyse the relevance of scientific research and predict its scale. At the same time, it was recorded that the achieved level of research competence of the PhD students of the CG was the highest for design and substantive components, and the worse – for procedural, optional, and communicative components.

Figure 1 shows that positive changes were recorded in the PhD students of the EG after applying the method of using AI in building the research competence. There is an increase in the achieved level of research competence compared to the current one for substantive (by 7.5%), design (by 10%), procedural (by 8.4%), optional (by 11.4%), and communicative (by 8.5 %) components. In the CG of PhD students, an increase in research competence was recorded for substantive (by 2.6%), procedural (by 2.6%), and communicative (by 2.6%) components. Much higher growth rates of research competence of PhD students testify to the effectiveness of the proposed method of using AI in building the research competence of future scientists/scholars/academicians. This proves the appropriateness of using AI in building the research



competence of PhD students. AI promotes the development of their ability to analytically evaluate their research activities, determine the appropriateness of methods, techniques and means of planning and conducting individual research. Thanks to AI, the ability of PhD students to search for various information from various sources and to understand the possibility of their use within the framework of individual academic research increases. AI contributes to the development of the ability to manage the research process with an orientation towards a satisfactory end result. AI also enhances the motivation to conduct further research, to establish new and expand existing professional contacts. AI deepens the skills to analyse the relevance of one's academic research and predict its scale.

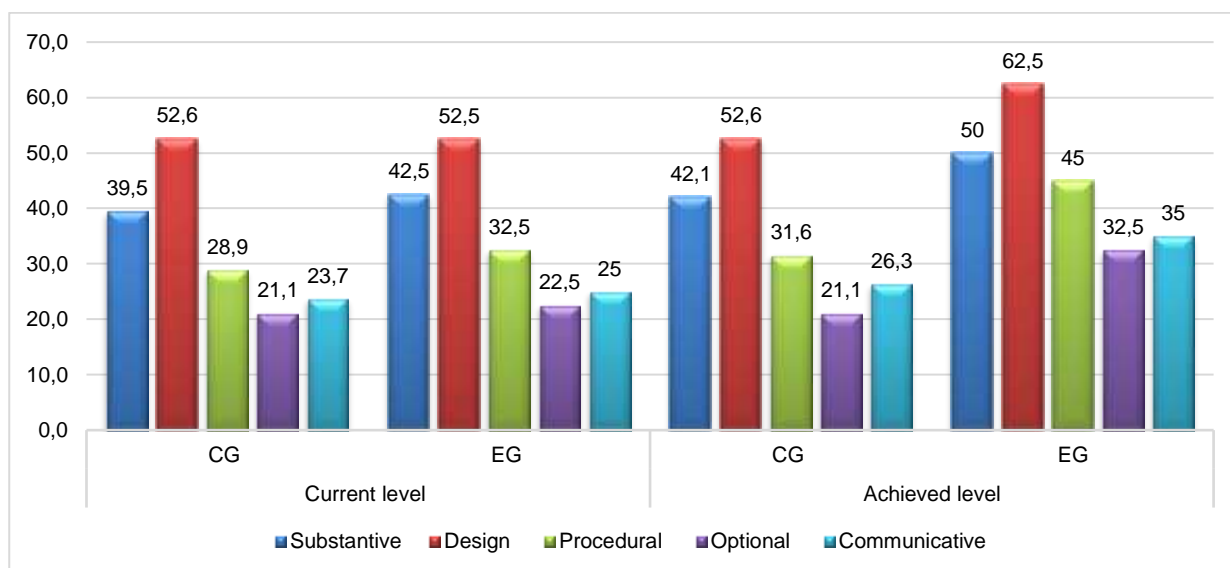


Figure 1. Comparative analysis of the levels of research competence of PhD students, %

Note: CG, EG are control and experimental groups, respectively.

Source: created by the author based on survey data of respondents

Discussion

The studies related to our research emphasize the importance of using AI in higher education. Attention is also focused on taking into account all the possible advantages and ethical challenges of introducing AI into educational and research practice (Jafari & Keykha, 2024). The authors of empirical studies state the positive impact of AI integration in the content of education of students, graduate students, improve the performance of students in many subjects, increase the efficiency of the learning process (Zhou, 2023). Similar studies emphasize the importance of using AI in personalizing the academic research of graduate students. The leading role of AI in conducting automatic assessment, selecting special training courses, systematizing the work of graduate students and generating a summary of the content of the analysed studies is noted (Riabets, 2023).

In the context of our research, the approach to creating an educational environment that optimally combines positive practices in the AI use is also worth noting (Spivakovsky et al., 2023). An empirically proven approach to the positive impact of AI tools on the development of students' programming skills, self-efficacy, and motivation for learning is interesting (Yilmaz & Yilmaz, 2023).

We also share the opinions of other researchers on the appropriateness of using AI to increase the innovation capacity of graduate students (Han et al., 2024).

In our research, we also received empirical confirmation of other researchers' opinion regarding the correlations between research and digital skills of PhD students (Ochoa-Tataje et al., 2024).

Our research is distinguished by a comprehensive approach to assessing the impact of AI on the development of all components of research competence of PhD students.

Summing up the results of our study, we can fully agree with the advantages and challenges of using AI in the training of graduate students mentioned by other researchers. The AI ability to optimize the work of future scientists/scholars/academicians on the topics of their research can be considered the main advantage, and the challenge is the violation of ethics and academic integrity by graduate students.

In contrast to our research, other study consider the examples of using AI as a personalized learning platform that can facilitate the learning of various subjects (Zhou, 2023). The research that differs from ours covers the use of chatbots as smart assistants (Chen et al., 2023), the use of AI as a programming training base (Yilmaz & Yilmaz, 2023).

Our study is important because of the possibility of solving the different points of view available in the academic and teachers' communities of HEIs regarding the appropriateness of using AI in the training of PhD students. The study is also a thorough insight for the development of a clear institutional policy of HEIs regarding the use of AI tools in the research work of PhD students. The research is the basis for the development of clear ethical criteria for the AI use by future scientists/scholars/academicians.

So, the aim of this research was achieved, which is to determine the AI role in the development of research competence of PhD students. The study confirms the importance of the AI role in building the research competence of PhD students. A positive difference between the achieved and current levels of research competence of PhD students was established through the fulfilment of the research objectives. Our proposed method of using AI in building the research competence of PhD students can be used in other universities of Ukraine.

Limitations

The main limitations of the study are the involvement of PhD students from two HEIs in Ukraine — Bohdan Khmelnytsky National University of Cherkasy and Alfred Nobel University. Although there is an opportunity to conduct similar empirical studies in other HEIs, which train PhD students.

Recommendations

The main recommendations are to expand the sample of the study by covering PhD students of various fields in HEIs of different specializations in a similar study. It is also recommended to test the proposed method of using AI for building the research skills of PhD students in different majors.

Conclusions

The study raised the relevant problem of using AI in building research competence of PhD students. The study is focused on the impact of AI on the development of the research competence components of PhD students (substantive, design, procedural, optional, and communicative). The current and achieved levels of research competence of PhD students was monitored for each of the components during the study. The authors of this research proposed and tested the method of using AI in building the research competence of PhD students. It involves the search for information on various resources, the formation of annotated catalogues of works on the issue under research. The proposed method employs the construction of virtual models of the research, the creation of algorithms of scientific research is used as part of. The method also provides for the development of personalized training courses, exchange of academic ideas, correlation analysis of empirical data, automatic verification and correction of authored academic texts. The study established that the majority of PhD students have higher levels of research competence in terms of substantive, design, and lower – in terms of procedural, optional, and communicative components. The



results of the study indicate that the AI use is appropriate to increase the level research competence of future scientists/scholars/academicians.

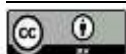
The study confirmed the hypothesis that the AI use contributes to increasing the level of research competence of PhD students. The obtained research results can be used in the professional training of PhD students, in the development of recommendations regarding the AI use in the development of research skills of future scientists/scholars/academicians. Further research may focus on the AI use for the development or adjustment of the content of the education of PhD students at HEIs of Ukraine.

Bibliographic References

- Almaraz-López, C., Almaraz-Menéndez, F., & López-Esteban, C. (2023). Comparative study of the attitudes and perceptions of university students in business administration and management and in education toward artificial intelligence. *Education Sciences*, 13(6), 609. <https://doi.org/10.3390/educsci13060609>
- Alqahtani, T., Badreldin, H. A., Alrashed, M., Alshaya, A. I., Alghamdi, S. S., bin Saleh, K., Alowais, S. A., ... & Albekairy, A. M. (2023). The emergent role of artificial intelligence, natural learning processing, and large language models in higher education and research. *Research in Social and Administrative Pharmacy*, 19(8), 1236-1242. <https://doi.org/10.1016/j.sapharm.2023.05.016>
- Artyukhov, A., Volk, I., Surowiec, A., Skrzypek-Ahmed, S., Bliumska-Danko, K., Dluhopolskyi, O., & Shablustyi, V. (2022). Quality of education and science in the context of sustainable development goals—from millennium goals to agenda 2030: Factors of innovation activity and socio-economic impact. *Sustainability*, 14(18), 11468. <https://doi.org/10.3390/su141811468>
- Chen, Y., Jensen, S., Albert, L. J., Gupta, S., & Lee, T. (2023). Artificial intelligence (AI) student assistants in the classroom: Designing chatbots to support student success. *Information Systems Frontiers*, 25(1), 161-182. <https://doi.org/10.1007/s10796-022-10291-4>
- Chen, Z. (2023). Artificial intelligence-virtual trainer: Innovative didactics aimed at personalized training needs. *Journal of the Knowledge Economy*, 14, 2007-2025. <https://doi.org/10.1007/s13132-022-00985-0>
- Farrelly, T., & Baker, N. (2023). Generative artificial intelligence: Implications and considerations for higher education practice. *Education Sciences*, 13(11), 1109. <https://doi.org/10.3390/educsci13111109>
- Galushko O., & Batmanghlich, C. (2023). Ethical and practical aspects of using the artificial intelligence in the educational process. *Philosophy, Economics and Law Review*, 3(2), 47-52. <https://doi.org/10.31733/2786-491X-2023-2-47-52>
- Han, X., Xu, Q., Xiao, J., & Liu, Z. (2024). Academic atmosphere and graduate students' innovation ability: The role of scientific research self-efficacy and scientific engagement. *European Journal of Psychology of Education*, 39(2), 1027-1044. <https://doi.org/10.1007/s10212-023-00737-x>
- Horta, H., & Li, H. (2023). Nothing but publishing: The overriding goal of PhD students in mainland China, Hong Kong, and Macau. *Studies in Higher Education*, 48(2), 263-282. <https://doi.org/10.1080/03075079.2022.2131764>
- Ibrahim, H., Liu, F., Asim, R., Battu, B., Benabderrahmane, S., Alhafni, B., Adnan, W. ... & Zaki, Y. (2023). Perception, performance, and detectability of conversational artificial intelligence across 32 university courses. *Scientific Reports*, 13(1), 12187. <https://doi.org/10.1038/s41598-023-38964-3>
- Jafari, F., & Keykha, A. (2024). Identifying the opportunities and challenges of artificial intelligence in higher education: a qualitative study. *Journal of Applied Research in Higher Education*, 16(4), 1228-1245. <https://doi.org/10.1108/JARHE-09-2023-0426>
- Korolevska, L. (2023). *What HR professionals need to know about artificial intelligence in 2023*. Konkurent. Retrived from <https://acortar.link/HoV4YH>
- Law of Ukraine No. 2145-VIII. "On Education". *Verkhovna Rada of Ukraine*, 2017. Retrived from <https://zakon.rada.gov.ua/laws/show/2145-19>
- Liaw, S. Y., Tan, J. Z., Lim, S., Zhou, W., Yap, J., Ratan, R., & Chua, W. L. (2023). Artificial intelligence in virtual reality simulation for interprofessional communication training: Mixed method study. *Nurse Education Today*, 122, 105718. <https://doi.org/10.1016/j.nedt.2023.105718>



- Malinka, K., Peresini, M., Firc, A., Hujnák, O., & Janus, F. (2023). On the educational impact of chatgpt: Is artificial intelligence ready to obtain a university degree? In *Proceedings of the 2023 Conference on Innovation and Technology in Computer Science Education*. New York: Association for Computing Machinery. <https://doi.org/10.1145/3587102.3588827>
- Melnykova, O. (2023). Problems of humanity in artificial intelligence and its impact on society. In A. Yatsyshyn (Ed.), *Collection of materials of the 11th All-Ukrainian Scientific and Practical conference of young scientists "Scientific Youth-2023"*. Kompyrnt, Kyiv. Retrieved from http://www.uintei.kiev.ua/sites/default/files/zbirnik_konferenciya_naukova_molod_2023.pdf
- Mousavi Baigi, S. F., Sarbaz, M., Ghaddaripouri, K., Ghaddaripouri, M., Mousavi, A. S., & Kimiafar, K. (2023). Attitudes, knowledge, and skills towards artificial intelligence among healthcare students: A systematic review. *Health science reports*, 6(3), e1138. <https://doi.org/10.1002/hsr2.1138>
- Ochoa-Tataje, F. A., Romero-Vela, S. L., Alza-Salvatierra, Silva del Pilar, Alza-Salvatierra, M. S., Garro-Aburto, S. F., & Clemente-Castill, C. P. (2024). Digital competencies and research skills in graduate students: A bibliometric study. *International Journal of Religion*, 5(5), 892-901. <https://doi.org/10.61707/7485fa63>
- Oleynik, O., & Das, B. (2023). Professional burnout in pedagogy of specialists working in higher education sphere. *Philosophy, Economics and Law Review*, 3(2), 203-211. <https://doi.org/10.31733/2786-491X-2023-2-203-211>
- Oliinyk, I. (2024). Implementation of artificial intelligence elements in the process of forming research competence of future doctors of philosophy in postgraduate studies. In *Horizons of Innovation: Conference on Multidisciplinary Trends in Science 2024*. (pp. 61-64). Futurity Research Publishing, Lodz. Retrieved from <https://acortar.link/gaw4z1>
- Oliinyk, I., Bulavina, O., Romanenko, T., Tatarnikova, A., & Smirnov, A. (2024). The role of artificial intelligence in building the research competence of future doctors of philosophy. *Revista de la Universidad del Zulia*, 15(43), 377-396. <https://doi.org/10.46925/rdluz.43.22>
- Pokotylo, K. M., & Sylkina, S. O. (2023). Academic culture and integrity in the educational process in the conditions of military realities (on the example of the Faculty of Architecture of the Kyiv National University of Civil Engineering and Architecture). *Slobozhan Scientific Bulletin*, 3, 144-149.
- Riabets, O. (2023). The formation of research competence among students of the third educational and scientific level of higher education in the process of distance learning in the conditions of a full-scale Russian invasion. In A. Yatsyshyn (Ed.), *Collection of materials of the 11th All-Ukrainian Scientific and Practical conference of young scientists "Scientific Youth-2023"*. Kompyrnt, Kyiv. Retrieved from http://www.uintei.kiev.ua/sites/default/files/zbirnik_konferenciya_naukova_molod_2023.pdf#page=146
- Shablusty, V. V. (2023). About academic integrity in the conditions of war. In A. Artiukhov, M. Vikhliaiev, Yu. Volk (Ed.), *Academic integrity, open science, and artificial intelligence: How to create a virtuous educational environment: A collection of professional development essays*. Liha-Pres, Lviv-Torun. Retrieved from https://nubip.edu.ua/sites/default/files/u404/zbirnik_ese_advanced_training_academ.integr.pdf
- Snopenko, H. V. (2021). Impact of technology development on enterprise personnel management. In *Science and innovations in the 21st century: Materials of the 1st All-Ukrainian Internet Conference of students and young scientists. Information technologies. Management and administration. Civil security and law*. Melitopol. http://www.tsatu.edu.ua/im/wp-content/uploads/sites/24/konf_2021_t2-1.pdf#page=105
- Spivakovsky, O. V., Omelchuk, S. A., Kobets, V. V., Valko, N. V., & Malchukova, D. S. (2023). Institutional policies on artificial intelligence in university learning, teaching and research. *Information Technologies and Learning Tools*, 97(5), 181-202. <https://doi.org/10.33407/itlt.v97i5.5395>
- Teng, Y., Zhang, J., & Sun, T. (2023). Data-driven decision-making model based on artificial intelligence in higher education system of colleges and universities. *Expert Systems*, 40(4), e12820. <https://doi.org/10.1111/exsy.12820>



- Yilmaz, R., & Yilmaz, F. G. K. (2023). The effect of generative artificial intelligence (AI)-based tool use on students' computational thinking skills, programming self-efficacy and motivation. *Computers and Education: Artificial Intelligence*, 4, 100147. <https://doi.org/10.1016/j.caeai.2023.100147>
- Zhou, C. (2023). Integration of modern technologies in higher education on the example of artificial intelligence use. *Education and Information Technologies*, 28(4), 3893-3910. <https://doi.org/10.1007/s10639-022-11309-9>
- Zhytomyska, T. M. (2024). The role of digitalisation in shaping the research competence of higher education students. *Innovative Pedagogy*, 70(2), 173-176. <https://doi.org/10.32782/2663-6085/2024/70.2.36>





ONLINE ISSN: 2665-0223
PRINT ISSN: 1856-7576