

Innovation to optimize the teaching and development of modern education in the field of culture and art: vectors of development

Innovación para optimizar la enseñanza y el desarrollo de la educación moderna en el ámbito de la cultura y el arte: vectores de desarrollo

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Abstract

The essence of optimization is the creation of the most favorable conditions for obtaining the desired results without excessive use of time and reduction of physical activity. This aspect is an important component of training specialists in the field of culture and arts, as it allows to increase the efficiency of the educational process and reduce resources to achieve this result. It should be noted that the relevance of the proposed topic is undeniable - the search for optimal solutions to reform the educational process has been going on for more than a decade. Accordingly, the article aims to analyze innovative approaches to optimizing the teaching and development of modern cultural education. Both general theoretical methods and special art studies were used in the preparation of the work. In particular, the analytical method was used to determine the current state of teaching cultural and art disciplines, to characterize the content of curricula and programs. Among other methods we have used, we define synthesis, analysis, induction and deduction. Based on the research, it was found that in addition to traditional teaching methods, special ones should also be used, in particular, more attention should be paid to distance learning methods.

Key words: optimization, innovative approaches, teaching, culture and art.

Resumen

La esencia de la optimización es la creación de las condiciones más favorables para obtener los resultados deseados sin un uso excesivo del tiempo y la reducción de la actividad física. Este aspecto es un componente importante de la formación de especialistas en el ámbito de la cultura y las artes, ya que permite aumentar la eficacia del proceso educativo y reducir los recursos para lograr este resultado. Cabe señalar que la relevancia del tema propuesto es innegable: la búsqueda de soluciones óptimas para reformar el proceso educativo se lleva a cabo desde hace más de una década. En consecuencia, el objetivo del artículo es analizar los enfoques innovadores para optimizar la enseñanza y el desarrollo de la educación cultural moderna. En la elaboración del trabajo se han utilizado tanto métodos teóricos generales como estudios artísticos especiales. En particular, se utilizó el método analítico para determinar el estado actual de la enseñanza de las disciplinas culturales y artísticas, para caracterizar el contenido de los planes de estudio y los programas. Entre otros métodos que hemos utilizado, definimos la síntesis, el análisis, la inducción y la deducción. Sobre la base de la investigación, se constató que, además de los métodos tradicionales de enseñanza, también deberían utilizarse otros especiales, en particular, debería prestarse más atención a los métodos de aprendizaje a distancia. El trabajo con plataformas en línea con un control adecuado demuestra un alto índice de éxito. Si se siguen investigando los métodos de optimización, se mejorará el proceso de enseñanza en la práctica.

Palabras clave: optimización, enfoques innovadores, enseñanza, cultura y arte.

1. Introduction

The modern educational process in the field of culture and art implies the involvement of the latest teaching methods aimed not only at the assimilation of new material by students, but also at the development of practical skills. At the same time, an important problem is an optimization of the educational process, which does not harm teaching (i.e., does not occur by radically reducing theoretical courses), but with the use of digital technologies and pedagogical techniques that require detailed study. For a long time, European and American universities have practiced varieties of optimization, through which students are able to gain additional knowledge and skills during their studies, although the search for optimal solutions to reform the educational process has been going on for decades. At the same time, such schemes are beginning to be used for Central and Eastern Europe, thanks to which both positive and negative elements and risks can be taken into account. Accordingly, an important task remains the analysis of the experience of using digital Internet technologies in the process of training cultural professionals.

The importance of optimization is to create a more favorable environment for getting results without time and without significant additional burdens. This aspect is an important component of the training of specialists in the field of culture and arts, as it allows reducing the cost of resources to achieve the result. Hence, the article aims to analyze the innovative approaches to the optimization of teaching and development of modern cultural education.

2. Literature review

The theoretical part of the study is formed based on the modern cultural and pedagogical research of contemporary authors. Ukrainian researchers pay much attention to the analysis of transformations in the national education system. For example, Serdyukov (2017) analyzed the key innovations of the modern educational process. The author focused on the coverage of education in the United States of America, his analytical note also discusses ways to increase the rate of innovation transformation in the educational system.

Rutkovska (2021) outlined the main points of discussion on the prospects for incorporating innovative cultural approaches in the teaching of modern humanities branches. She believes that culture is an important means of building a democratic society, a kind of tool influencing the unity of its individual elements.

Zelenska (2021) investigated the basic principles of introducing culturological education in higher education institutions.

At the same time, the methodological basis of the article is dumped by the works of modern foreign pedagogues and cultural scientists. For example, Hussin (2020)

described in detail the main transformational challenges in the field of culture and art. Andersone, 2020, explored the main innovative principles of modern education that improve teaching processes in Latvian universities. This researcher believes that the improvement of content and approaches of training programs takes place to develop the diverse competence of students in areas important for human activities. At the same time, Caiado et al., (2021) characterized the fundamental techniques of modern innovative teaching used to optimize the educational process. Zhang (2021) characterized the main processes of innovation and optimization of art teaching based on the analysis of the Internet plus technologies. In this paper, he explored the main advantages and difficulties of the new method of teaching art through the lens of the properties of the Internet Plus platform. In addition, he investigated the use of this technology through the current moody network, APP, WeChat, and other modes of learning.

Pérez et al. (2018) analyzed the specifics of optimizing arts learning through video games. They believe that during game-based classes, students are primarily focused on the purpose of the game and have the enthusiasm and desire to explore a particular cultural phenomenon. At the same time, experts explain that, on the other hand, students have a passive attitude when they fulfill the role of just recipients of knowledge, often they are bored when they are in traditional art classes. Consequently, to involve students more in the educational process, and in-depth achievement of educational goals, the importance of games of educational purpose, formed on new technologies, has increased markedly. Thus, the problem under study has received some response in the professional literature, however, it is covered partially, primarily based on a general analysis of innovative teaching methods. Consequently, the analysis of innovative approaches to the optimization of teaching in the field of culture and art has not yet received much attention in analytical studies.

3. Materials and methods

Both general theoretical methods and special art history methods were used in the work. To achieve the goal of the research, such methods were applied as analytical - to find out the current state of teaching cultural and art history disciplines, to characterize the content of curricula and programs on these sciences, theoretical - to summarize the initial provisions, which determined the methodological basis of the work, and in summarizing its conclusions. In general, the study is built on the principles of objectivity, scientific and systematic. Of the general theoretical methods of research, we will distinguish - synthesis, analysis, induction, and deduction.

Also, the article is formed based on the application of the method of abstraction, which provides a transition from generalized theories to the formation of specific conclusions. Some attention is also paid to empirical methods of collection and interpretation. In particular, the robot is constructed based on a critical analysis of curricula. At the same time, the presentation of the material is built based on the application of chronological and retrospective principles. At the same time, the problem of further implementation of innovative approaches to optimize the development of modern education in the field of

culture and art is covered by the predictive method. The study also used the statistical method, which is based on a qualitative analysis of experimental data.

4. Results

The term “optimization” from Latin translates as “the most favorable or the best of the possible”. Optimization refers to the teacher's systematic approach to the organization of the educational process based on the regularities and fundamental principles of learning, as well as a scientifically argued choice of the best variant of the theory of this process.

Thus, optimization of learning activities includes:

1. Formation of goals and objectives for each lecture, seminar (or other forms of training).
2. Conformity of the teaching content with the goals and tasks
3. Selection of a rational combination of forms of students' educational activities
4. Implementation of curricula based on the plan
5. Analysis of the results and evaluation of the optimality of curricula

Teachers in the field of culture and art can consciously optimize their professional activities by choosing the most necessary and successful way to perform pedagogical work (Zhang, 2021). Thus, the optimization of scientific and educational processes in higher education institutions can take place by taking into account specific initial principles: the improvement of pedagogical activity of a teacher of fine arts and cultural disciplines by optimizing the organizational and methodological support of professional work and development of his/her own creative traits; wide actualization of emotional, ethical, aesthetic, intellectual and creative perspectives of a culture and art teacher directly in the educational and scientific processes, etc.

Today's experts prove that teachers, as a result of optimizing their professional work, can obtain degrees such as:

1. elementary (the teacher is characterized only by some features of professional activity).
2. basic (when a teacher knows the basics of pedagogical work);
3. perfect (the teacher is characterized by a clear direction of the educational process and quality of pedagogical actions);
4. creative (at this stage the teacher fully owns initiative and creative approaches to the implementation of educational activity) (Zelenska, 2021).

In particular, one of the varieties of optimization in contemporary art education is the formation of integrative courses, integrative modules, which not only allow mastering the educational material but also promote personal development. Such disciplines aim to generalize and systematize philosophical-aesthetic, psycho-pedagogical, and art history knowledge to reveal the spiritual potential of art and work with modern scientific literature.

This is partly realized by involving additional philosophical disciplines (in particular, logic and anthropology, but also history and sociology).

For example, in the United States, social studies and humanities courses in cultural studies are usually allocated approximately the same amount of class time - about 22-27%, taking into account the specifics of the institution and its specialization.

Typically, this group of subjects includes history, economics, philosophy (particularly logic and anthropology), and a foreign language. At the same time, U.S. curricula have a unique feature that is not typical or not well represented in European educational institutions (Mesquita et al., 2021). These include the active involvement of communication disciplines related to public speaking style, small group discussions, and the primary goal of which is to enhance critical analysis. At the same time, an optimization component of the training of specialists in culture and art is the emphasis on American achievements in this field. European and Asian art histories are indisputably presented, but in general, the emphasis is on Americanist studios. Such an approach is justified because it is the American labor market that will be the potential employers of future professionals. For this reason, the main focus of their training is the study of local traditions only with the additional knowledge of other artistic practices, mostly necessary for a comparative context. There is markedly high attention to the history of the United States itself and neglect of knowledge of events in the world. It should be noted that this phenomenon is in principle characteristic of American humanities: the study of history is also American-centered, so that, for example, the history of World War II covers the expanse of the Pacific, where the main American troops acted, while the war in Europe is of secondary importance.

Consequently, the increase in the number of structural modifications of training specialists in the field of culture and arts is ensured through the spread of modular curricula and the use of cyclic structures of curricula. The principle of cyclicity is, among other things, also the distribution of training courses into quite large separate periods during which students acquire knowledge, form skills, and abilities in the subject. Individualization and differentiation are evident in the continuous training process by allowing students to determine the sequence of modules and courses themselves, which is due to multifaceted curricula (Mesquita et al., 2021). This technique allows for the adjustment of the individual learning trajectory, adapting it as flexibly as possible to the needs of the students.

The European best practices are also important in terms of optimizing education and training. For the most part, continental European states have unified curricula for academic disciplines. At the same time, France has introduced a modular system of education. Thanks to this optimization, students of different specialties (including also future specialists in culture and arts) annually receive certain official documents that enable them to enter the labor market without completing a full course of study and obtaining a bachelor's or master's degree. This is achieved by the particularities of the formation of curricula in universities or specialized art schools and other institutions - teachers create them based on clear blocks of disciplines. This makes it possible for

students to obtain intermediate qualification certificates after several years of study. These modules (or the overwhelming majority of them) in French institutions of higher education are constructed in such a way that they influence professional and specialized training of the future specialist in cultural studies but form it based on integration with other disciplines of the socio-humanitarian cycle (Andersone, 2020). We consider this experience of optimizing the educational system to be useful because such a system of training organization allows a flexible response to the needs of the labor market, as well as encourages young people to find a job that corresponds to their interests. This makes it possible to meet the need for workers with appropriate qualifications.

The richness of training programs is also manifested in their content, and not only in their structural construction. In particular, the importance of such an element as pedagogical practice can vary depending on the cultural discipline from 0 to 50% of the total teaching time (Serdyukov, 2017). Note that the control over the implementation of training is carried out taking into account the traditions of its organization. For example, in Germany universities have a certain autonomy, while in England project management is carried out under the control of state national services (in particular, the Agency for Teacher Education), and in France, such functions are performed directly due to direct instructions from the government or the Minister of National Education. Accordingly, fine-tuned and stable work on curricula and timely monitoring of tasks can significantly optimize the educational system.

In order to optimize learning in China, there is a special network plane called “Internet Plus”. It is a national strategy that is deeply involved in various spheres of life. In addition, “Internet Plus” has its own specific uses in teaching art in colleges or universities, and this new mode of art education is constantly being optimized and improved. In China, teaching art and culture based on the “Internet Plus” platform can also take place through the modern network of moody, other mobile applications, WeChat, and other modes. Zhang (2021) conducted an anonymous survey among Chinese university students on the new platform of teaching art in colleges and universities. The questionnaire talked about the features of teaching and learning, their disadvantages, and their advantages. The results showed that the average attendance of Massive Open Online Courses (MOOCs) at art universities is 81%. This indicates that the majority of students are interested in this paradigm of learning and motivated to learn using the resources of the World Wide Web. At the same time, according to the attitudes of Chinese university students toward the innovative mode of learning, almost 70% of students sympathize with the mixture of online and offline learning (Zhang, 2021). This fact supports the view of the popularity of innovative learning optimization methods, including based on the prevalence of the Internet Plus platform among Chinese students.

In the e-learning environment, most European universities have developed their own E-learning platforms on which learning takes place. Thus, European institutions offer specific learning solutions for their online visitors. These e-learning environments offer learning opportunities on different topics and for different target groups. Visitors to these

platforms are exposed to didactically prepared multimedia content. Their content offers visitors future learning pathways. In addition, e-learning on E-learning platforms often focuses on continuous learning processes and extended visits (Queiroz-Neto et al., 2021). This is done so that students are better able to work through a topic. This in turn allows users to actively participate, interact, and creatively collaborate with other users. Several European universities integrate their E-learning into a special web2.0 global service, which allows students to actively communicate with each other and even create new content. To optimize learning in the field of culture and art, a number of educational games and quizzes can be found on the web pages of European museums (Pérez et al., 2018).

Effective use of Internet resources is indeed impossible without the parallel creation and promotion of a course in protective media literacy. We are talking about a special directed curriculum for culturologists, which will minimize the damage threatening students from aggressive propaganda machines (in today's world, we are talking primarily about Russia and the active dissemination of its rails and anti-cultural messages). Such courses make it possible to avoid propaganda traps and to verify the information received.

This approach affects the integration of art and cultural heritage education and new game technologies through which students and ordinary visitors to the sites can explore artistic heritage. The games are structured in a variety of ways, from simple activities such as collecting a museum artifact to creating medieval music. This encourages users not only to memorize information but also affects the formation of skills to find new and creative ways in the field of art and culture.

5. Discussion

Currently, the training of specialists in the field of culture and art is focused on the formation, development, and correction of the fundamental knowledge acquired by students, as well as the improvement of practical skills and abilities. Based on this, there is a gradual change in the paradigms of teaching this specialty both in Ukraine and in Europe and America. In particular, the first signs of this were gradual changes in the standards of culturological education, justified by the transition to the Bologna system of evaluation and training, which in recent decades has become established in many leading European countries.

At the same time, the rapid development of technology, the globalization challenges of our time, the COVID-19 pandemic, and other factors have led to changes both in society itself and, among others, in the education system. Note that they manifested themselves differently in different disciplines (and, accordingly, training), but the understanding and the need to optimize education are quite relevant to modern systems of training specialists.

The effectiveness of theoretical and practical training of future specialists in cultural studies directly depends on the teachers' ability to interest and activate students, awaken

their desire and develop the ability to work creatively and effectively (Serdyukov, 2017). Accordingly, in our opinion, a special combination of teaching methodology with practice is required, which together can significantly develop the cognitive capabilities of students. Note that this does not mean a complete rejection of traditional problem-seeking, analytical or illustrative methods of teaching, but only about their combination with new forms of the learning organization.

In particular, throughout the practice of distance learning has proven effective platform Moodle, through which you can create additional opportunities to use in the educational process of the distance learning system. Thanks to such blended learning, it is possible to freely distribute software products and freely apply and modify the product or its individual elements. The use of LMS Moodle in the training of future specialists in cultural studies allows to familiarize students with the educational content and simultaneously provides an opportunity to form an individual learning trajectory of disciplines. Also, thanks to this technology it is possible to keep the feedback - dialogic communications in the direction of "student-content", "student-teacher", "student-student", the possibility of control measurement of knowledge, etc.

Turning to the results of using LMS Moodle, we note the positive aspects of this optimization of the learning process: the formation and improvement of electronic courses; growth of motivation for learning (which is especially noticeable during distance or blended learning); improvement of teaching skills using Internet tools. At the same time, problems are also noticeable: difficulties in cooperation, inefficient use of time, and lack of student self-discipline. The proposed remarks are also quite true for other online learning systems. Accordingly, personal experiences with such platforms should be taken into account to qualitatively optimize learning and determine their suitability for teaching cultural studies courses. Obviously, working with the continued use of such platforms will require a combination of personal experience and faculty expertise - this could be the key to the success of a blended learning system in the future.

We believe that the disciplines of the media-educational cycle related to the consideration and analysis of direct human contact with a variety of technical devices are relevant in today's learning environment. Already now the model of communication between a person and a computer or other device has been greatly simplified: keyboard controls have been rather quickly replaced by tactile controls, i.e., the need to use text or any other auxiliary commands has disappeared (Andersone, 2020). Probably the next more important improvements can be expected in the coming years - in particular, the gradual use of audio control, which will have the character of a dialogue between operators (users) and powerful computers with high performance, a considerable amount of RAM (needed to provide and maintain) interaction with a person, such as decoding his voice, etc.) and much larger sizes of permanent memory.

Education in the field of culture and art today is impossible without increasing the practical part of students' training. One of the ways to optimize the education and training of future

specialists is, therefore, to focus on the formation of skills and abilities, not only on the mastery of theoretical knowledge. This can be achieved by increasing the number of relevant classes and reducing the role of lecture courses. For Ukraine, this European experience is quite relevant, because the domination of the theoretical part in the methodology of teaching in our institutions of higher education is still quite significant.

Also, the pedagogical process should be optimized based on humanitarianization, i.e., awareness of the importance of the humanistic component in the training system. In particular, a humanistic style of contact at the teacher-student level, the involvement of participants in the educational process in cultural negotiations fit into the process of cultural identification. Thanks to this it is possible to achieve that the future specialist in culture and art will be able to better interact with other people (including non-specialists), which in modern conditions can only be greeted. The ability to explain complex things in an accessible way is an important “virtue” of modern professionals, so you should not get carried away in the training processes with modern computerized disciplines alone.

6. Conclusions

The analyzed experience of the European, American, and Chinese systems of training specialists in the field of cultural studies testify to a considerable updating of the content of academic disciplines, formed taking into account the modern achievements of science and technology. In particular, specialists pay much attention to the integration of elements of Internet education into the educational process. This combination makes it possible to optimize the individual elements of learning, to interest students in the work, as well as quickly and correctly determine the results of learning. The use of modern digital platforms also contributes to the implementation of the latest teaching methods, in particular with the use of digital educational tools. Special attention, we believe, deserves the introduction in some European countries (first of all, in France) of the modular system of cultural studies training. Thanks to this, an important effect of cooperation with employers is achieved: after several years of training, students are able to start working. The aim of receiving education is not only to obtain the necessary knowledge and skills but also to be able to put them into practice and get a job. Such a modular system makes it possible to optimize and speed up this process considerably, to respond in time to the offers of the stakeholders.

On the other hand, the U.S. experience points to the importance of focused training, that is, the introduction of new disciplines aimed at improving personal qualities combined with a focus on the potential job market. The main focus of training in culture and the arts is the study of local traditions only with additional knowledge of other artistic practices, mostly necessary for a comparative context.

Online learning platforms also contribute to optimization. We believe that the positive aspects of this process should be considered an effective combination of traditional and innovative teaching methods, formation and improvement of e-disciplines; further introduction of technologies and means of distance learning (which in the context of the

COVID-19 pandemic has gained additional relevance - the trend to improve blended learning will also continue in the future) increase in motivation to learn, mastery of modern technologies and techniques (e.g. the use of game technologies) and However, the problems associated with such extensive use of computerized systems may become tangible: difficulty in cooperation, inefficient use of time, lack of self-discipline, etc. Accordingly, personal experience with online platforms should be considered to optimize learning qualitatively. We believe that the capabilities of Moodle are underestimated in the teaching environment. The platform has shown itself well as a means of optimizing the training of cultural studies in Ukraine. In particular, thanks to them it is possible to effectively combine the possibilities of traditional teaching with modern methods. Although it is not flawless and its use is also fraught with risks, it enjoys well-deserved popularity in Ukraine and other countries of Central and Eastern Europe. Undoubtedly, the further development of Internet technologies will highlight other, more advanced tools for optimizing the learning process. True, the combination of basic traditional methods of teaching and modern technologies will be the basis for further development of training in the field of culture and art.

7. Bibliographic references

- Andersone, R. (2020). Innovations in the improved curriculum content of the competence Approach: a case study in Latvia. *Rural Environment. Education. Personality (REEP)*, 13, 213-218. <https://doi.org/10.22616/reep.2020.025>
- Caiado, R., Fonte, R. F., & Barros, I. B. (2021). Metodologiasativas E novascompetênciasdocentes: Umaexperiência de produção de textosimagéticos no meio digital. *Revista Ibero-Americana de Estudos em Educação*, 2697-2715. <https://doi.org/10.21723/riaee.v16i4.14043>
- Hussin, S. (2020). Identity through culture and arts education. *Proceedings of the 1st International Conference on Language, Literature, and Arts Education (ICLLAE 2019)*, 461, 455-459. <https://doi.org/10.2991/assehr.k.200804.089>
- Lukyanets, A., Ryazantsev, S., Maksimova, A., Moiseeva, E., & Manshin, R. (2019). Theoretical, methodological and statistical problems of studying environmental migration. *Amazonia Investiga*, 8(19), 227-236. Retrieved from <https://amazoniainvestiga.info/index.php/amazonia/article/view/224>
- Mesquita, A., Abreu, A., & Carvalho, J. V. (2021). Perspectives and trends in education and technology: Selected papers from ICITED 2021. Springer Nature.
- Pérez, E., Merchán, M. J., Moreno, M., Merchán, P., & Salamanca, S. (2018). Use of serious games in informal learning: State of the art and future trends. *ICERI2018 Proceedings*. <https://doi.org/10.21125/iceri.2018.1898>
- Queiroz-Neto, J. P., Farias, M. S., & Chagas, E. L. (2021). Project based learning E design thinking Em um projeto de intercâmbio. *Revista Ibero-Americana de Estudos em Educação*, 1791-1806. doi: <https://doi.org/10.21723/riaee.v16i3.14557>

- Rutkovska, A. (2021). Culturological paradigm in education. *Scientific Bulletin Melitopol State Pedagogical*, 2(25), 136-141. doi: <https://doi.org/10.33842/22195203/2021/25/136/141>
- Serdyukov, P. (2017). Innovation in education: What works, what doesn't, and what to do about it? *Journal of Research in Innovative Teaching & Learning*, 10(1), 4-33. doi: <https://doi.org/10.1108/jrit-10-2016-0007>
- Zelenska, O. P. (2021). The culturological training and forming the culturological competence of the cadets at the establishments of higher education of the system of the ministry of internal affairs of Ukraine. *Pedagogical and psychological science and education: transformation and development vectors*, 181-201. doi: <https://doi.org/10.30525/978-9934-26-084-1-10>
- Zhang, Z. (2021). Innovation and optimization of the art teaching mode in universities under the internet plus background. 2021 4th International Conference on Information Systems and Computer Aided Education. <https://doi.org/10.1145/3482632.3483195>