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Readiness of higher education institutions for implementing dual education

Preparación de las instituciones de enseñanza superior para la aplicación de la formación dual

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Abstract

Dual education has gained relevance as a strategy to strengthen links between higher education institutions and the productive sector, particularly in professional fields requiring intensive practical training. This study aims to describe the preparedness of higher education institutions for implementing the dual education model by identifying institutional, regulatory, and operational factors influencing its adoption. A mixed descriptive and comparative approach was applied, combining regulatory analysis, statistical data review, and a survey administered to academic and administrative staff from selected institutions in Ukraine, Poland, and Germany. The survey explored perceptions of benefits, barriers, institutional capacity, and implementation conditions. Quantitative data were examined using descriptive and inferential statistics, while qualitative inputs supported contextual interpretation. The findings reveal cross national differences in regulatory frameworks, institutional coordination, and perceived preparedness, alongside shared challenges such as limited institutional experience, organizational complexity, and resource constraints. Respondents also emphasized benefits related to

employability, practical skills development, and stronger university industry collaboration. Rather than measuring readiness levels through indices or scales, the study provides a diagnostic overview of current conditions. The results offer evidence based insights that can inform institutional planning, policy development, and future research on technological and organizational readiness within dual education systems worldwide today broadly.

Keywords: clinical practice, dual education, foreign language, graduate employment, international experience, medical higher education institutions.

Resumen

La educación dual ha adquirido relevancia como estrategia para fortalecer los vínculos entre las instituciones de educación superior y el sector productivo, especialmente en campos profesionales que requieren una formación práctica intensiva. Este estudio tiene como objetivo describir la preparación de las instituciones de educación superior para implementar el modelo de educación dual, identificando los factores institucionales, regulatorios y operativos que influyen en su adopción. Se empleó un enfoque descriptivo y comparativo de carácter mixto, que combinó análisis normativo, revisión de datos estadísticos y la aplicación de una encuesta a personal académico y administrativo de instituciones seleccionadas en Ucrania, Polonia y Alemania. La encuesta exploró percepciones sobre beneficios, barreras, capacidades institucionales y condiciones de implementación. Los datos cuantitativos se analizaron mediante estadística descriptiva e inferencial, mientras que los insumos cualitativos apoyaron la interpretación contextual. Los resultados evidencian diferencias entre países en marcos regulatorios, coordinación institucional y preparación percibida, así como desafíos compartidos como la limitada experiencia institucional, la complejidad organizativa y las restricciones de recursos. Asimismo, se destacan beneficios asociados con la empleabilidad, el desarrollo de competencias prácticas y el fortalecimiento de la colaboración universidad empresa. El estudio no mide niveles de preparación mediante índices, sino que ofrece un diagnóstico.

Palabras clave: empleo para graduados, experiencia internacional, formación dual, instituciones de enseñanza superior médica, lengua extranjera, práctica clínica.

Introduction

In 2021–2025, higher education, in particular medical education, underwent transformations in different countries under the influence of the labour market, military challenges, and European integration processes. One of the key areas was the dual education, which combines university theory with clinical practice, ensuring early professional immersion, the development of practical skills, and increasing the competitiveness of graduates. At the same time, common barriers – lack of clinical facilities, regulatory inconsistency, overload of mentors, and difficulties in combining education with practice – are noted in Ukraine, Poland, and Germany. However, despite the active development of dual models, the existing literature still lacks an integrated cross-country analysis that simultaneously compares regulatory foundations, quantitative trends, and empirical perceptions of stakeholders in medical education. This gap necessitates a comprehensive assessment of institutional readiness for the implementation of dual training. Therefore, the aim of the study was reformulated as describing the readiness of higher education institutions to implement the dual model by identifying institutional, regulatory, and operational factors shaping this process, based on the analysis of regulatory documents, statistical data, and empirical evidence in comparison with international practices.

The aim was achieved through the fulfilment of the following research objectives:

- Analyse the current regulatory framework for dual education in the field of medicine in Ukraine, Poland, and Germany and outline common and distinctive features;
- Establish trends in the development of dual programmes in 2021–2025 and their impact on the employment of medical graduates;
- Identify barriers and advantages of implementing dual education based on the results of a survey of students and teachers;
- Assess the role of a foreign language in ensuring the effectiveness of clinical practice and international mobility.

The practical significance is the ability to use the results for improving dual education models, taking into account successful practices from different countries, as well as developing recommendations for eliminating institutional and regulatory constraints that hinder the integration of dual medical trainin.

Literature Review

In 2021–2025, the academic discussion on dual education and the readiness of universities to implement it has significantly intensified, covering theoretical, pedagogical, managerial, and technological aspects. Almulla (2022) studied students' readiness for innovative teaching methods, identifying psychological and institutional factors of their effectiveness. Bai (2023) proposed a "dual-leader" model that increases the manageability of educational institutions through improving management structures. In a context close to Ukraine, Baimukhambetova & Sakhariyeva (2024) emphasized the importance of regulatory support and partnership with employers, which echoes the conclusions of Berezuk (2021) on the experience of the All-Ukrainian Consortium. Batista, Mesquita, and Carnaz (2024) presented a broader view, linking educational transformation with digitalization and the introduction of generative AI. Similarly, Belkina et al. (2025) showed the potential and risks of using AI for training. At the same time, Bisri et al. (2023) emphasized that the success of digital transformation depends on the readiness of institutions and their interaction with the labour market.

Butler et al. (2024) analysed the globalization of dual training in nursing, focusing on dual programmes and the combination of theory and clinical practice. A local example is provided by Ciumacenco (2022), who proved that effective models are possible even in small systems, but their sustainability depends on university initiatives. In the field of digitalization, Fadlelmula & Qadhi (2024) summarized the experience of the Gulf countries, pointing to the AI's potential to increase student engagement, but also to gaps in legal and ethical regulation. In contrast, Gudoniene et al. (2025) emphasized that the success of blended learning in European universities depends primarily on the teachers' and students' willingness to adapt to institutional innovations.

Izzicupo et al. (2022) and Kocsis & Pusztai (2021) converge in highlighting that the success of dual education depends not only on organizational arrangements but also on an institutional culture capable of balancing educational and professional demands. From a broader systemic perspective, Komekbayev et al. (2025) demonstrate that the effectiveness of Kazakhstani dual programmes is strongly associated with their alignment with international standards, while Kovačević (2023) emphasizes that innovative methodological approaches in dual education exhibit a high degree of universality, transcending regional contexts. At the macro level, Nikonenko et al. (2022) show that investment dynamics linked to Industry 4.0 correlate with universities' capacity to implement innovative practices, thereby shaping the structural conditions that enable dualization processes. Complementing this perspective at the meso level, Semenets-Orlova et al. (2022) identify human-oriented management mechanisms—such as stakeholder co-design, cyclical feedback, and mentoring regulations—as key factors ensuring the governability and sustainability of dual programmes. Finally, Yukhymenko et al. (2024) extend this discussion by demonstrating that structured hybrid models, based on a deliberate balance between online and face-to-face components, enhance student engagement and adaptability. These competencies, in turn, facilitate smoother transitions between academic learning and workplace-based training, reinforcing the operational feasibility of dual education systems.

Methodology

The study was conducted from January to August 2025 in two stages. The first stage consisted of a regulatory and comparative analysis of documents governing the implementation of dual education in higher and medical education. Comparability was ensured by selecting two key regulatory acts for each country.

In the Ukrainian context, such acts are the Law of Ukraine "On Education" (Verkhovna Rada of Ukraine, 2025a), which defines dual education as a combination of academic training and practice, and the Law of Ukraine "On Higher Education" (Verkhovna Rada of Ukraine, 2025b), which outlines implementation mechanisms, including the possibility of concluding tripartite agreements between the student, the university, and clinical facilities.

In Germany, the regulatory framework consists of the Vocational Training Act (Federal Ministry of Justice and Consumer Protection, 2023), which defines the general principles of dual education, and the Nursing Professions Act (Federal Ministry of Health, 2025), which specifies regulations for medical training.

In Poland, the basic regulatory documents include the Law on Higher Education and Science (Republic of Poland, 2022), which establishes the possibility of implementing dual programmes in HEIs, and the Regulation of the Minister of Education and Science (Minister of Education and Science, 2023), which details the procedure for completing professional practice for medical students.

The second stage involved a content analysis of statistical and analytical sources, including the Statistical Yearbook of the State Statistics Service of Ukraine "Labour in Ukraine in 2023" (State Statistics Service of Ukraine, 2024) and the European Commission Report "Employment and Social Developments in Europe 2023" (European Commission, 2023). These sources have official status and are representative in nature, which ensures reliability and allows tracking the development trends of dual education in the medical field.

Methods

The study used regulatory and legal analysis to systematize the provisions of national and international acts, a comparative method to compare the Ukrainian model with the German and Polish ones, content analysis of statistical and reporting materials to determine the status of the implementation of dual education, as well as a sociological survey as a tool for collecting empirical data.

Sample

The survey covered 50 respondents. The sample included 30 4th–6th year students of National Pirogov Memorial Medical University of Vinnytsya and Bogomolets National Medical University, as well as 20 teachers and heads of clinical practice of these institutions. Respondents were selected based on the criteria of direct involvement in dual education, experience in completing or organizing internships in clinics and laboratories, as well as participation in programmes that included elements of studying a foreign language as a component of academic mobility. The choice of these universities is explained by the fact that they have a developed network of clinical facilities and have already implemented pilot elements of dual education. So, the study is positioned as a pilot and is aimed at an in-depth analysis of specific practices, the results of which can be extended to other medical HEIs.

Instruments

The data were collected through an online questionnaire via Google Forms and semi-structured interviews in Zoom. Qualitative analysis of responses was performed using MAXQDA Analytics Pro 2022, which made it possible to code materials by key categories. Quantitative processing was carried out in SPSS 28.0 using Student's t-test to identify statistically significant differences between groups of respondents. The results were visualized in Datawrapper. All data were collected anonymously, and respondent participation was voluntary. The questionnaire consisted of items grouped into four dimensions (regulatory awareness, practical readiness, perceived barriers, and perceived benefits). Its content validity was confirmed through expert review by three specialists in medical education, and internal consistency reached acceptable indicators (Cronbach's $\alpha = 0.78$). Ethical parameters complied with institutional academic integrity standards and the General Data Protection Regulation (European Union, 2025).

Results and Discussion

Documentary Analysis

The documentary analysis revealed significant variations in the legal and institutional foundations for dual medical education across Ukraine, Germany, and Poland.

The legal framework for dual education in medicine is based on a combination of general and specialized acts in different countries. In Ukraine, the Law "On Education" (Verkhovna Rada of Ukraine, 2025a) establishes the dual form as a combination of academic training and practice, and the Law "On Higher Education" (Verkhovna Rada of Ukraine, 2025b) defines the mechanisms for its implementation, in particular tripartite agreements between the student, the university, and clinical facilities. The Concept of Training Specialists in the Dual Form (Cabinet of Ministers of Ukraine, 2018) further outlines the minimum share of practice and requirements for its quality. In Germany, the regulatory framework is defined by the Vocational Training Act

(Federal Ministry of Justice and Consumer Protection, 2023), which establishes dual training as a national standard, and the Nursing Professions Act (Federal Ministry of Health, 2025), which specifies training procedures in the medical field. In Poland, dual education is supported by the Act on Higher Education and Science (2022) and the Regulation of the Minister of Education and Science (Minister of Education and Science, 2023), which enable universities to organise dual programmes in cooperation with clinical facilities.

Table 1 presents the regulatory framework for dual education in medicine in Ukraine, Germany, and Poland, which includes the main laws and by-laws that determine the legal framework, organizational mechanisms, and practical training of students.

Table 1.
Scheme of the regulatory framework for dual education in medicine (Ukraine - Germany - Poland)

Country	Document	Explanation	Why the main
Ukraine	Law "On Higher Education" (Verkhovna Rada of Ukraine, 2025b)	Defines the organizational mechanisms of the educational process, including tripartite agreements.	Provides an opportunity to formalize cooperation between universities and clinics.
Ukraine	Order of the Cabinet of Ministers of Ukraine No. 660-r (Cabinet of Ministers of Ukraine, 2018). The Concept of Training Specialists According to the Dual Form of Education.	A programme document establishing the framework, definitions, minimum practice requirements and quality criteria for implementing dual education.	Determines national priorities and requirements for the organisation of dual training.
Germany	German Vocational Training Act (Federal Ministry of Justice and Consumer Protection, 2023)	The basic law of Germany, which defines the structure of dual education.	Forms a model of dual education, which has become a reference in the EU.
Germany	German Nursing Professions Act (Federal Ministry of Health, 2025)	The specialized law in the field of medical professions, specifies dual education.	Provides a medical dimension of dual education in Germany.
Poland	Law on Higher Education and Science of Poland (Republic of Poland, 2022)	The basic law on higher education in Poland, which provides for dual programmes.	Creates a legal basis for the development of dual programmes in Poland.
Poland	Regulation of the Minister of Education and Science (Minister of Education and Science, 2023)	Regulates the organization of dual education in HEIs, in particular the students' practice.	Provides a mechanism for practical training of students in medical institutions.

Source: created by the author based on the Law of Ukraine "On Higher Education" (Verkhovna Rada of Ukraine, 2025b), the Concept of Training Specialists According to the Dual Form of Education (Cabinet of Ministers of Ukraine, 2018), the Vocational Training Act of Germany (Federal Ministry of Justice and Consumer Protection, 2023), and the Law on Higher Education and Science of Poland (Republic of Poland, 2022).

The regulatory framework for dual education in medicine in Ukraine, Germany, and Poland is based on a common structure in which general higher-education laws are complemented by policy documents and specialised regulations governing clinical training. In Ukraine, the system is still being developed: the Law of Ukraine "On Higher Education" (Verkhovna Rada of Ukraine, 2025b) provides the general framework, while the Concept of Training Specialists According to the Dual Form of Education (Cabinet of Ministers of Ukraine, 2018) defines the required proportion and organisation of practice, which is mainly concentrated after the completion of basic academic preparation. Germany represents a fully integrated model: the Vocational Training Act (Federal Ministry of Justice and Consumer Protection, 2023) establishes dual training as a national standard, and the Nursing Professions Act (Federal Ministry of Health, 2025) specifies its implementation in the medical field, ensuring clinical practice from the first year and accounting for more than half of the curriculum. In Poland, the Law on Higher Education and Science (Republic of Poland, 2022) allows universities to introduce dual programmes, while the Regulation of the Minister of Education and

Science (Minister of Education and Science, 2023) outlines the procedural requirements for organising clinical placements. As a result, the Polish model is more flexible but less integrated, with the share of practice typically not exceeding one third of the curriculum. Overall, Ukraine is currently closer to the Polish approach, whereas the German system represents a fully institutionalised, multi-level cooperation model between universities and clinical facilities. Table 2 presents comparative parameters of dual education in the medical field across the three countries.

Table 2.
Comparative parameters of dual education in the field of medicine (Ukraine – Germany – Poland)

Parameter	Ukraine	Germany	Poland
Legal framework	Law of Ukraine "On Higher Education" (Verkhovna Rada of Ukraine, 2025b)	Vocational Training Act (Federal Ministry of Justice and Consumer Protection, Germany, 2023), Nursing Professions Act (Federal Ministry of Health, Germany, 2025).	Law on Higher Education and Science (Republic of Poland, 2022), Regulation of the Minister of Education and Science (Minister of Education and Science, 2023).
Proportion of practical training	Mostly internships; limited in curricula (less than 30%).	More than 50% of the curriculum is practice.	On average, about 30% of the curriculum.
Form of cooperation with medical institutions	Cooperation through agreements between HEIs and clinics; regulated by the Ministry of Health.	Clinics and hospitals are mandatory partners; cooperation is enshrined in law.	Hospitals and laboratories are involved on a contractual basis; requirements are flexible.
Level of integration of practice	Internship integrated mainly from the 4th year, previously limited to clinical modules.	Practice is integrated from the 1st year of study; systemic in nature.	Practice is integrated from 2–3 years of study; depends on the major.
Role of state bodies	Regulation by the Ministry of Education and the Ministry of Health in combination; emphasis on orders of the Ministry of Health.	Regulation is carried out by federal laws and professional chambers.	Regulation is carried out by the Ministry of Education and Science; the Ministry of Health controls special programmes.
International mobility and foreign language	Participation in academic mobilities is limited; a foreign language is sometimes included in internship programmes.	International mobility is provided; a foreign language is included in the training standards.	International mobility is possible, but limited to grant programmes; foreign language is an additional component.

Source: created by the author based on the Law of Ukraine "On Higher Education" (Verkhovna Rada of Ukraine, 2025b), the Concept of Training Specialists According to the Dual Form of Education (Cabinet of Ministers of Ukraine, 2018), the Vocational Training Act of Germany (Federal Ministry of Justice and Consumer Protection, Germany, 2023), the German Nursing Professions Act (Federal Ministry of Health, Germany, 2025), the Law on Higher Education and Science of Poland (Republic of Poland, 2022), and the Regulation of the Minister of Education and Science of Poland (Minister of Education and Science, 2023).

The data in Table 2 reflect three models of dual education in medicine. In Germany, it has the highest level of institutionalization: the BBiG (Federal Ministry of Justice and Consumer Protection, 2023) and PflBG (Federal Ministry of Health, 2025) laws integrate practice from the first year, its share exceeds 50%, the participation of clinics is mandatory, and standards are controlled by professional chambers; mobility and language training are built into the system. Poland demonstrates moderate integration: the Regulation of the Minister of Education and Science of Poland (Minister of Education and Science, 2023) provides for the start of practice from the 2nd–3rd year, its proportion is about a third of the curriculum, partnership with hospitals is flexible and contractual; mobility depends on grants, and the language component is additional. In Ukraine, the system is in the early stages: the Law of Ukraine "On Higher Education" (Verkhovna Rada of Ukraine, 2025b) and the Concept of Training Specialists According to the Dual Form of Education (Cabinet of Ministers of Ukraine, 2018) concentrate practice mainly in postgraduate studies; its share is

usually less than 30%, cooperation with clinics is mainly contractual, and coordination between the Ministry of Education and the Ministry of Health is fragmented; language training and mobility are limited. In general, a gradation of readiness can be traced: Germany > Poland > Ukraine; the main gaps in Ukraine are the lack of an early start, a low share of practice, the optionality of partnerships, and a non-standardized language component. Overall, the documentary analysis highlights three distinct regulatory models, reflecting different levels of integration of clinical practice in medical dual education.

Statistical Analysis

Statistical analysis shows the gradual spread of dual education in the medical field. According to the State Statistics Service of Ukraine (2024), the number of higher education institutions introducing elements of dual training has been steadily increasing since 2020, with Medicine and Pharmacy programmes showing the fastest adoption rates. The statistical data also indicate that the employment rate of graduates who participated in dual programmes is, on average, 18–20% higher than that of graduates of traditional internship-based pathways. European evidence (*Employment and Social Developments in Europe 2023*) confirms the effectiveness of the model: in Germany, the employment rate of graduates of dual programmes exceeds 90%, in Poland it is around 75%, while in Ukraine in 2023 it reaches 62%. A Student's t-test revealed statistically significant differences between students and teachers regarding the perception of clinical readiness ($t(48)=2.31$, $p=0.025$, 95% CI [0.12, 1.45]), indicating that teachers evaluate institutional conditions more critically than students. These findings suggest that dual education enhances the competitiveness of young professionals and holds substantial development potential for the Ukrainian medical education system. Figure 1 shows the dynamics of the expansion of dual programmes and the employment rate of graduates of medical HEIs in Ukraine and the European Union in 2021–2025.

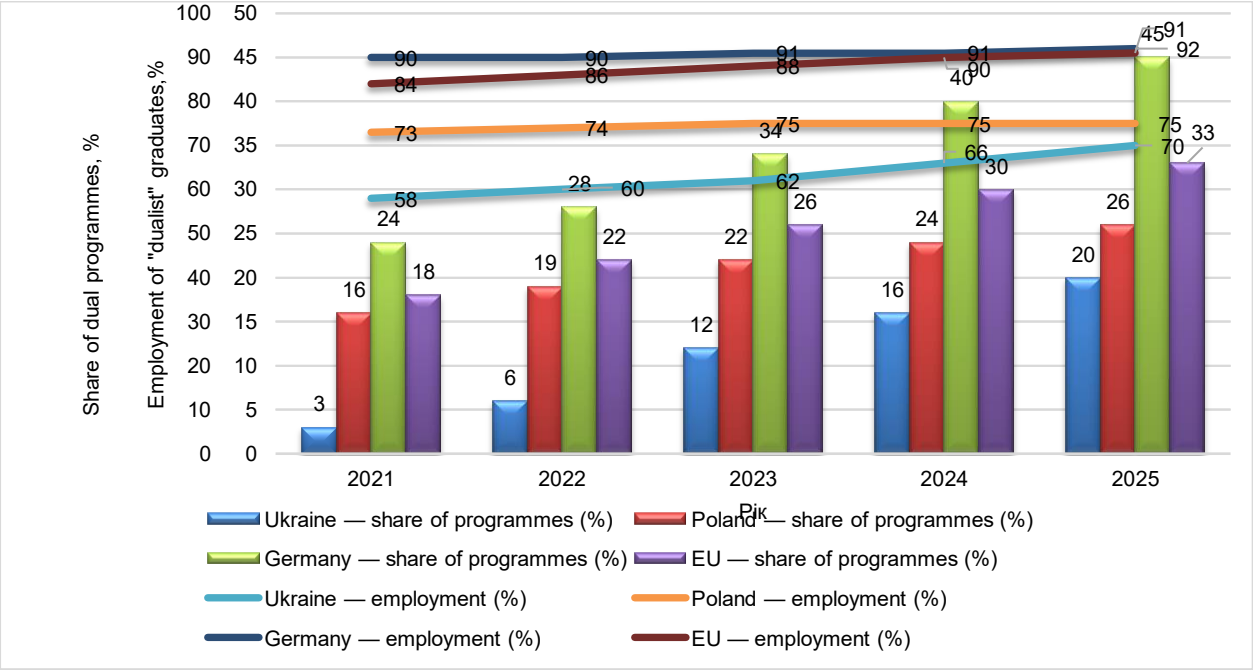

Figure 1. Dynamics of the prevalence of dual programmes and employment of graduates of medical universities in Ukraine, Poland, Germany, and the EU (2021–2025).
Source: created by the author based on the Law of Ukraine "On Education" (Verkhovna Rada of Ukraine, 2025a), the Law of Ukraine "On Higher Education" (Verkhovna Rada of Ukraine, 2025b).

Figure 1 demonstrates the positive dynamics of the spread of dual programmes and the growth of graduate employment. In Ukraine, the share of programmes with a dual component increased from 3% in 2021 to

20% in 2025, and employment – from 58% to 70%. These indicators are higher in EU countries: the share of dual programmes increased from 18% to 33%, and employment steadily exceeds 85%, reaching 91% in 2025. This indicates that Ukraine is closing the gap, but still lags behind European standards. The survey confirmed the key barriers: lack of clinical facilities, difficulty combining classes with practice, inconsistency of programmes, as well as overload of mentors and limited funding. At the same time, respondents identified the following advantages: for students – early professional immersion and the possibility of employment, for teachers – enhanced motivation, responsibility, and development of practical skills that are not achievable within classroom training. These findings confirm that dual medical education is associated with higher employability outcomes, although national systems differ in pace and scale of implementation.

Qualitative Analysis

The qualitative component of the research captures perceptions of students and academic staff regarding barriers and benefits of dual medical education.

Figure 2 shows the main barriers and benefits of dual education in medical HEIs according to the results of a respondents' survey.

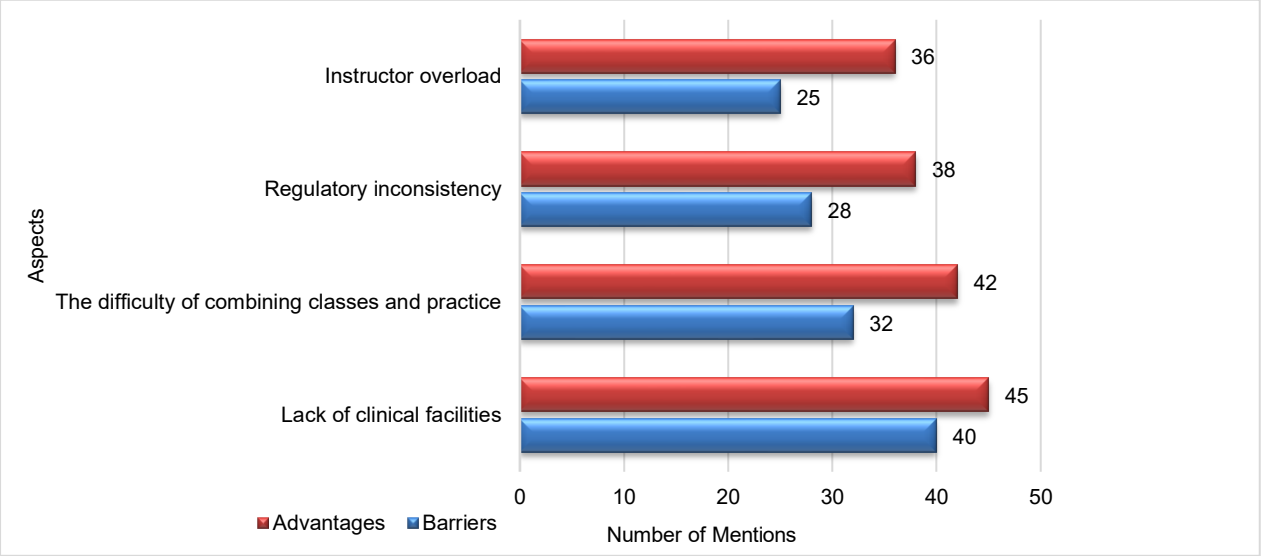

Figure 2. Barriers and advantages of dual education in medical HEIs as assessed by respondents. Source: created by the authors based on their own research.

Figure 2 shows the results of a survey on barriers and benefits of dual education in medical HEIs. The barriers are dominated by a lack of clinical facilities (40 mentions), followed by the difficulty of combining classes and practice (32), regulatory inconsistency (28), and mentor overload (25). Among the advantages, the leading ones were the possibility of employment (45) and early immersion in practice (42), as well as the formation of professional contacts (38), and enhanced student motivation (36). In general, the number of mentions of advantages (161) exceeds the barriers (125), which indicates a positive perception of the dual model. At the same time, respondents emphasized the need to expand clinical facilities, harmonize curricula, and stimulate instructors.

The role of a foreign language was particularly emphasized: 72% of students noted that proficiency in English or German facilitates internships, especially in international projects and hospitals where documentation is maintained in a foreign language. Teachers emphasized that language training is a prerequisite for academic mobility and exchange programmes. In this context, a foreign language is

considered a factor in the competitiveness of graduates and a means of integrating dual education into the European space.

The qualitative evidence indicates that despite structural constraints, stakeholders perceive dual medical training as beneficial, particularly due to early professional immersion and improved employment opportunities.

The generalized results show that the readiness of HEIs to implement the dual model in medicine is gradually increasing in Ukraine, Poland, and Germany, but is developing at different rates. The regulatory framework in all countries creates the basis for cooperation with clinics, while requiring greater coherence and practical adaptation. A comparative analysis showed differences in the level of detail of legal regulation and the share of practical training: in Germany, practice is integrated from the first years and makes up more than half of the curriculum, in Poland it covers about a third, while in Ukraine it usually does not exceed 30%. The focus on clinical facilities and the combination of study with work are common to the three countries. Statistics confirm the positive dynamics of the spread of dual programmes and the growth of graduate employment, and the survey indicates the simultaneous presence of barriers (lack of clinical places, overload of mentors) and advantages (increased motivation, early immersion in the profession, employment). The role of a foreign language as a condition for academic mobility and integration into the European space is recognized as an important factor. Taken together, this indicates a significant potential for the development of dual education, provided that organizational and regulatory barriers are overcome.

The results of the study showed that Ukrainian HEIs in the field of medicine demonstrate a gradual increase in the number of dual programmes and higher employment rates of graduates, although the gap with EU countries persists. This empirical finding directly confirms the conclusions of Kramarenko, Nadtochii & Hryshyna (2023), who argued that the integration of the dual model in Ukraine remains fragmentary due to insufficient alignment with international practices. Our survey results specifying limited clinical facilities and regulatory inconsistency reinforce the arguments of Lytvyn, Fediuk & Kukhta (2024), who emphasized that infrastructural development and incentives for partner organizations are necessary preconditions for effective implementation.

The identified advantages, particularly early immersion in professional practice and high employability, empirically reinforce the view that the effectiveness of dual education is closely linked to employers' active involvement and the availability of adequate clinical or production facilities. Furthermore, the strong emphasis placed by respondents on the role of a foreign language aligns with the findings of Maiya and Aithal (2023), confirming that language training enhances graduates' competitiveness and facilitates international mobility.

The imbalance between barriers and benefits revealed in our data corresponds to the results of Perfectson et al. (2025), who proved that blended learning models reduce organizational risks and enhance student motivation. Furthermore, the dependence of the implementation of the dual model on digital solutions observed in our study supports the conclusions of Phokoye et al. (2024) and Rahmadi (2024) regarding the role of robotics and digital transformation in ensuring flexibility and adaptability of educational processes. In addition, the respondents' emphasis on motivation and engagement directly aligns with the conclusions of Sarin et al. (2025), who demonstrated that gaming technologies significantly enhance student involvement and practical skill development in medical education, which strengthens the interpretation of student motivation factors revealed in our survey.

Our finding that regulatory fragmentation and resource constraints hinder the systematic implementation of dual programmes directly echoes the analysis by Rodríguez-Guerreiro et al. (2024) on the importance of sustainable organizational approaches. The significance of stakeholder involvement highlighted in our survey confirms the conclusions of Solcan et al. (2024) in the Moldovan context, demonstrating the transferability of this factor to Ukraine. Similarly, the search for optimal organizational models, noted by Stashuk (2021), is supported by the inconsistency reported by Ukrainian respondents.

The actualization of digital and language components revealed in our study correlates with the importance of new educational environments outlined by Tercanli & Jongbloed (2022). At the same time, the systematic implementation of dual programmes described by Varga & Sági (2024) contrasts with the Ukrainian stage of formation, which helps explain the lower institutional readiness identified in our data. Finally, the increased employment rates of Ukrainian "dualist" graduates empirically confirm the conclusions of Yaroshenko (2023) regarding the compliance of dual education with labour market needs.

Limitations

The study covered only two Ukrainian medical universities and relied on selected examples from Germany and Poland, which limits the generalizability of the findings. The sample size (50 respondents) restricts the statistical power, and the survey results reflect perceptions rather than objectively measured institutional readiness. In addition, the study did not assess the quality of clinical facilities or the long-term outcomes of dual programmes, which may influence the accuracy of the conclusions.

Recommendations

The study was limited to two medical universities in Ukraine and comparative examples from Germany and Poland, which constrains the generalizability of the findings.

Conclusions

The study confirmed that medical HEIs in Ukraine, Poland and Germany are at different stages of development of the dual model, but demonstrate a common positive dynamics of its spread. The regulatory framework in all countries creates the basis for cooperation between universities and clinical facilities, while requiring, to varying degrees, further detailing and practical adaptation. Statistics showed an increase in the number of dual programmes and an increase in the level of graduate employment, while the survey results revealed a combination of barriers, including a lack of clinical facilities, regulatory inconsistency and overload of mentors, and advantages, including high employability, early immersion in practice and enhanced student motivation. All respondents identified the role of a foreign language as a significant factor, which increases the competitiveness of graduates and contributes to international mobility. Comparative analysis showed that more detailed regulation and mandatory participation of clinical facilities in Germany form an established model. A flexible approach with contractual partnerships is used in Poland, while key parameters are still at an early stage in Ukraine. In general, this determines the directions of further development of the dual education system in medicine.

The academic novelty of the study is the integration of normative, statistical, and empirical analyses. The practical significance is the possibility of improving the legislative framework, developing clinical infrastructure and harmonizing educational practices with the experience of EU countries. At the same time, the results of the study provide grounds for formulating specific recommendations in the policy and management areas. It is necessary to introduce targeted state programmes to support clinical facilities, in particular through infrastructure financing and mentor training; create grant mechanisms for integrating a foreign language into dual programmes as a mandatory component of professional training; strengthen cooperation with international clinics and universities to expand the range of practical bases and academic mobility programmes; and develop mechanisms to stimulate instructors to reduce the risk of overload and improve the quality of practical training.

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