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Axiological measurements of the educational potential of value-oriented disciplines in higher education

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Abstract. The study addressed the educational potential of value-oriented academic disciplines (VOAD) in the context of higher education institutions with religious founders. The study aimed to substantiate the educational potential of value-oriented disciplines in higher education institutions and to determine their role in shaping the moral and civic values of young students. The study revealed the essence of the educational potential of value-oriented disciplines as an integral characteristic of the educational process, which ensures not only the transmission of knowledge, but also the transformation of the student's worldview based on Christian anthropology and the principle of "human as the image of God". The study analysed two key dimensions of the realisation of this potential, namely, worldview, which involved the formation of a holistic Christian view of the world in which science and faith were seen as complementary ways of cognition, and professional activity, focused on education through the concept of servant leadership and the principles of professional ethics. The study emphasised the practical significance of such disciplines for improving the quality of life of students, their therapeutic function, and the development of soft skills and emotional intelligence. The study also critically examined the potential risks of implementing this system, in particular the danger of indoctrination and the problem of the so-called greenhouse effect when graduates encounter the realities of secular society. The necessity of balancing value formation and the development of autonomous critical thinking as a condition for the mature personal and professional identity of graduates was substantiated. The proposed approach addressed VOAD as a tool not only for education but also for preparing students for responsible public service in a pluralistic environment. The results of the study can be used in the development and improvement of educational programmes in higher education institutions focused on the integration of the value and academic dimensions of education

Keywords: Christian anthropology; integration of faith and learning; servant leadership; worldview; professional ethics; soft skills

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Introduction

Modern higher education is undergoing fundamental paradigm shifts, where the priority is not only the transfer of professional knowledge, but also the formation of a well-rounded personality capable of responding to complex challenges. In global uncertainty, rapid technological transformation and socio-cultural crises, the university must restore its role as a centre for the formation of human values. The relevance of researching the axiological dimensions of the educational potential of academic disciplines is determined by the need to bridge the gap between professional competence and moral maturity of specialists. This is particularly relevant in the context of society's demand for leaders who possess not only technical skills, but also a strong ethical core, developed emotional intelligence and the ability to serve society. Therefore, reconsideration of the content and methodology of teaching value-oriented disciplines is a critical task for ensuring the quality of education that meets high standards of humanism and professional responsibility.

An analysis of studies shows that the issue of axiologisation of education was substantially addressed. Researchers concur that the value component is no longer an additional element but has become a strategic vector for the development of pedagogy. In particular, scholar U. Khodjamkulov (2024) emphasised that axiologisation of education is a necessary response to contemporary challenges. The study concluded that values determine the intrinsic meaning of education and serve as a reliable guide for shaping the worldview of future professionals, retaining stability in conditions of social turbulence. A significant body of research is devoted to the relationship between value-based education and the development of soft skills. For instance, S. Hamid (2025) proved that the integration of emotional intelligence components into educational programmes acts as a catalyst for effective learning. Developing this idea, D. Garner *et al.* (2025) highlighted that there is a direct correlation between the level of emotional competence formed by value-oriented disciplines and the academic performance of students. This confirms the thesis that the educational potential of disciplines has a measurable impact on the quality of training. The pragmatic aspect of the problem, viewed through the prism of labour market requirements, is also relevant. A. Hachkevych & M. Vesolovska (2023) analysed employer expectations and noted that emotional competence and value maturity are considered by businesses to be critical factors in professional suitability, often outweighing even purely technical skills. Digitalisation has become a separate challenge for the higher education sector. M. Ghosh (2025) addressed the ethical risks of artificial intelligence use. The study justified the need to establish a clear ethical framework by introducing specialised disciplines such as academic integrity into the curriculum, enabling students to interact critically and responsibly with the latest technologies.

In the context of higher education institutions with religious identity, the axiological dimension takes on a specific meaning. A. González (2024) emphasised that the Christian identity of a university should not be manifested declaratively, but through the integration of faith into scientific research and the content of educational programmes, forming a unique corporate culture. A practical embodiment of this approach is the strategy of "service learning". As N. Kaliappen (2025) noted, involving students in volunteer and social work within the framework of educational courses significantly increases the level of civil awareness and social responsibility. Christian anthropology is the fundamental basis for implementing this approach. H. Liessi & L. da Silva Liessi (2022) argued that the educational process in a Christian institution should be based on the principle of "human as the image of God", which implies the comprehensive development of the personality. This idea was further developed by J. Taylor (2022), noting that the goal of education is not simply professionalisation, but the restoration of the spiritual and moral integrity

of the student, where the educational potential of disciplines is achieved through the methodology of integrating faith and learning.

The study aimed to provide a theoretical justification and empirical analysis of the axiological dimensions of the educational potential of a block of value-oriented academic disciplines in a higher education institution with a Christian identity (using the example of the Ukrainian Humanitarian Institute (UHI), a private higher education institution). To achieve this goal, the following research tasks were accomplished: to reveal the essence and structure of the educational potential of selected disciplines in the humanities and theology in the context of the modern paradigm of higher education; to analyse the content and thematic diversity of value-oriented disciplines at the UHI (from bioethics and Christian philosophy to academic integrity with AI) as a tool for shaping the worldview of students; to identify the peculiarities of perception and criteria for the selection of value-oriented disciplines by students of different forms of education (full-time vs. part-time); and to reveal the correlation between the content of courses and the demands of young people for the formation of soft skills and emotional intelligence.

Materials and Methods

The research was conducted within the framework of a qualitative case study strategy, which was used for an in-depth analysis of the unique educational environment of a higher education institution with a religious identity. The study was descriptive and analytical in nature, combining a theoretical determination of axiological principles with an empirical analysis of educational practice. The chronological scope of the study covered the 2023-2024 and 2024-2025 academic years, which made it possible to trace the dynamics of subject selection and the adaptation of course content to current challenges (in particular, the ethical aspects of artificial intelligence). The empirical basis for the study was the educational space of the Ukrainian Humanitarian Institute (n.d.).

The study was based on a comprehensive combination of general scientific and specific approaches. The axiological approach served as the basis for considering education as a process of transmitting values, defining value orientations as the core of professional training. The anthropological approach, applied through the prism of Christian anthropology, was used to interpret the educational potential of disciplines as a tool for restoring personal integrity (integration of the spiritual, intellectual and emotional). The systemic approach ensured that the block of elective disciplines was considered not as a set of disparate subjects, but as a holistic ecosystem influencing the worldview of the applicant. The object of empirical analysis was a block of free-choice disciplines provided by the Department of Theology for students of all specialities.

The units of analysis were normative documents: curricula, syllabi (a total of 15 syllabi were analysed) and statistical data. These included reports on the choice of disciplines by full-time and part-time students. The principle of material selection was based on a comprehensive sample of value-oriented disciplines that had an explicitly expressed value orientation (worldview, ethical, biblical studies courses, etc.). To solve the tasks set, a set of complementary methods was used, namely: the content analysis method was used to process the content of syllabi (in particular, the courses "Theology of Love", "Academic Integrity with AI", "Christian Ethics", etc.). The method was used to identify key semantic units (values, competencies, learning outcomes), which made it possible to determine the content focus and axiological load of the courses; the categorisation and classification method was used to structure the array of selected disciplines. This made it possible to group courses into thematic blocks (biblical-textual, worldview-philosophical, ethical-applied) and identify the structural logic of the formation of the value block; the hermeneutic method was used to interpret the theological and philosophical concepts embedded in the courses. Its task was to analyse how traditional Christian

meanings are adapted to the perception of modern students ("Generation Z") and transformed into the language of professional competencies. Comparative analysis was used to compare the priorities of discipline selection by different groups of respondents. This identified significant differences in the motivation and value demands of full-time students (focus on communication, emotional intelligence) and part-time students (focus on pragmatics and existential issues). The results were processed by summarising qualitative data, which concluded on the effectiveness of the existing model of value-oriented education at the university.

Results and Discussion

One of the priority tasks of value-oriented disciplines is the formation of a stable axiological sphere of personality. In the context of the modern socio-cultural environment, which is often characterised by moral relativism, J. Kaplan (1989) emphasises the focus of the educational potential of these disciplines on establishing a system of absolute moral coordinates. Developing this idea, L. Biryuk & S. Pishun (2022) argue that the implementation of the axiological dimension primarily involves the internalisation of universal virtues, when the educational content becomes part of the student's personal beliefs. It is advisable to define the essence of the educational potential of value-oriented educational disciplines (VOAD). VOAD is considered an integral characteristic of a training course, reflecting the totality of the objective possibilities of its content, methodological tools and the personality of the teacher. The realisation of this potential ensures not only the transfer of cognitive information but also the purposeful transformation of the student's worldview. The process involves the assimilation of such basic values as truth, justice, mercy, dignity and freedom of choice. At the same time, as U. Khodjamkulov (2024) emphasises, a substantial aspect is the formation of moral resilience – the ability of an individual to resist negative social influences. The development of emotional intelligence is substantial in this process. D. Kaltved (2021) and S. Hamid (2025) highlighted that the determination of the humanistic aspects of disciplines fosters a "culture of the heart" and the capacity for empathy. At the same time, the implementation of the educational potential of value-oriented academic disciplines is not an automatic consequence of the presence of axiologically rich content, but requires targeted methodological support for the educational process. This involves the use of pedagogical approaches such as dialogic learning, reflective and narrative practices, problem-value analysis, and learning through socially meaningful activities, which create conditions for the internalisation of values rather than their formal assimilation.

A substantial theoretical basis for the determination of the educational potential of value-oriented disciplines is the concept of the educational potential of higher education institutions in general. For instance, I. Krasnoshchok (2019) defined educational potential as a multidimensional system that includes value-semantic, organisational-pedagogical and personal components, and emphasises the need for its purposeful development and scientifically based criteria for implementation. The study noted that the effectiveness of educational influence depends not only on declared values, but also on the consistency between the content of education, institutional culture and real practices of interaction in higher education. In this context, the VOAD appears as a partial but conceptually significant manifestation of the general institutional educational potential, which requires systematic management and constant reflection. In this context, the problem of operationalising the VOAD and defining the criteria for its implementation, which can ensure transition from declarative level to analytically verified results, becomes relevant. Such criteria may include the formation of students' value-semantic orientations, the ability to engage in moral reflection, manifestations of responsible behaviour in educational and social activities, as well as readiness to make independent ethical choices in professional situations.

Analysing the components of VOAD, the worldview dimension should be highlighted first. It is implemented through the formation of a holistic Christian worldview, within which scientific knowledge and faith are understood as complementary ways of interpreting reality. J. Greene & S. Yu (2015) emphasise the need to ensure epistemological breadth, which involves engaging students in analysing problems through the prism of different paradigms. According to H. Siegel (2017), such a multidimensional perspective stimulates the development of critical thinking. The educational effect of this approach, according to A. Tamayo (2025) involves overcoming dogmatism and fostering respect for alternative interpretations. A substantial component of the worldview dimension is the orientation of the educational process towards an existential search for meaning. S. Billett (2011) and V. Klotz *et al.* (2014), as well as M. Kryger & A. Qvortrup (2025), view academic disciplines as a platform for personal reflection on fundamental anthropological questions. In this context, education takes on a transformative character. The formation of historical and cultural identity is notable. As noted by B. Paridinova *et al.* (2023), this is achieved through awareness of spiritual origins of culture. In this vein, S. Bryan (2023), reviewing works on biblical theology, notes that awareness of cultural identity through biblical goals provides a broader determination of the nature of ethnicity. The study noted that involvement in the Bible-based civilisational tradition contributes to the formation of civic responsibility. Another component of VOAD is the professional-activity dimension. Yu. Kolisnyk-Humeniuk (2014) and UNODC experts (2016) are convinced that true professionalism is impossible without adherence to high moral standards. In turn, K. Blanchard & P. Hodges (2006) insist that professional competence must be organically combined with ethical responsibility. In this context, the system of educational influence addresses the formation of the concept of servant leadership, which is studied by J. Andersen (2018) and A. Canavesi & E. Minelli (2022). This requires a redefinition of career strategies. K. Patterson (2003) suggests viewing a career as a tool for responsible service to society, while R. Banks *et al.* (2016) support the view that such an approach fosters professionals capable of acting from a position of ethical maturity.

A substantial component is the formation of professional ethics in the digital age. M. Ghosh (2025) emphasises the importance of awareness of the moral limits of technology use and the affirmation of the priority of human dignity. In addition, the professional-activity dimension involves engagement in social practice. N. Kaliappen (2025) confirms that volunteering contributes to the formation of active citizenship, while M. Prentice (2007) argues for the importance of integrating theoretical knowledge with real-life experience. In the context of higher education institutions with a religious founder, A. González (2024) defines this potential as the ability to translate transcendent values into practical life. As evidenced by the list of courses at the Ukrainian Humanitarian Institute (n.d.), these subjects are applied in nature. For example, alongside G. Ashley & M. Cort (2007), C. Connerton & S. Theuri (2023) demonstrate the effectiveness of the NEWSTART model in the course "Healthy Lifestyle".

The therapeutic function of disciplines deserves special attention. Assessing the positive aspects of VOAD, A. Hachkevych & M. Vesolovska (2023) noted a significant contribution to the development of soft skills. According to F. Mendoza-Urbina *et al.* (2024), this compensates for the limitations of professional training focused on technical skills. N. Basnet *et al.* (2024) add that such disciplines perform a meaning-making function, providing a worldview foundation. However, there are critical aspects. J. Gross (1988) warns of the risk of double standards if the teacher is perceived as a role model but does not meet the expectations. W. Martino (2009) emphasises that the effectiveness of disciplines critically depends on the personality of the mentor. A. Lenton *et al.* (2013) also describe the problem of subjectivity in the choice of a teacher based on

sympathy, which can create an imbalance of competencies. In addition, N. Noddings (2012) and C. Mariskind (2014) noted the risk of indoctrination when teachers ignore the realities of secular society, which can cause cognitive dissonance in students. In this regard, the issue of preservation value autonomy of students requires consideration, since the effectiveness of educational influence directly depends on voluntary acceptance of values, rather than external regulatory control. In the absence of space for personal choice and critical reflection, there is a risk of forming superficial conformity, which does not ensure the stability of moral attitudes outside the educational environment. At the same time, it is advisable to consider the educational potential of value-oriented disciplines in a broader comparative context of contemporary higher education, where the axiological dimension is present in both confessional and secular educational models, although it is implemented through different pedagogical and worldview strategies. This approach avoids the reduction of the problem to the opposition between "religious" and "scientific" and defines VOAD as one of the possible forms of value integration in education.

The implementation of this approach is associated with a range of additional significant limitations. Firstly, there is the problem of scientific verification due to a direct conflict with the current consensus in the fields of biology and geology. This is due to the risk of excessive confessionalism, in particular the imposition of a narrow view of young Earth creationism, which may be perceived as a departure from scientific standards. This specificity creates a staffing problem – an acute shortage of teachers who combine the necessary worldview with a relevant natural science degree. As a result, this creates barriers to academic mobility, jeopardising the recognition of graduates' qualifications in secular educational and scientific institutions. These factors can lead to a phenomenon that S. Veenman (1984) characterises as the "greenhouse bubble" effect and "reality shock", when graduates are unprepared for harsh competition or ethical compromises in the labour market.

In the context of the Ukrainian Institute of Arts and Sciences, the educational potential of value-oriented disciplines is realised through a compulsory block of courses ("Biblical Theology", "Christian Ethics", "Healthy Lifestyle", "Leadership-Service"), which combine worldview, professional-ethical, and socio-practical dimensions of student training. The implementation of the axiological component is ensured using dialogical and reflective teaching methods, which promote the internalisation of basic moral values rather than their formal assimilation. The formation of moral resilience and civic responsibility is enhanced through the integration of the educational process with volunteer and socially significant activities, which can be used to correlate normative ethical models with real professional and social challenges. The educational potential of the disciplines is also manifested in the development of emotional intelligence, empathy, and responsible decision-making. At the same time, analysis of UHI's educational practice reveals several limitations in the implementation of VOAD related to the need to maintain a balance between confessional worldviews and modern academic standards, which highlights the need for constant epistemological reflection and methodological updating of the educational process.

Therefore, summarising the analysis, the educational potential of value-oriented academic disciplines appears to be a complex, multidimensional and, at the same time, vulnerable pedagogical phenomenon. Their significance is determined by their ability not only to convey a system of universal moral guidelines, but also to ensure the deep internalisation of values, forming a holistic worldview, moral stability, emotional maturity and professional responsibility of the individual. VOAD integrates worldview, professional-activity, therapeutic and socio-practical dimensions, acting as a conceptually relevant fragment of the general institutional educational potential of a higher education institution. At the same

time, the effectiveness of its implementation critically depends on the consistency between the declared values, the methodological culture of teaching, and the personal integrity of the teacher, which determines both significant educational opportunities and the risks of indoctrination, subjectivism, and loss of academic legitimacy. The tension between confessional worldviews and modern scientific standards requires consideration, as in the absence of proper epistemological reflection, it can cause isolationism, restrictions on academic mobility, and the phenomenon of the "greenhouse bubble". Thus, the further development of VOAD requires not a simplification or radicalisation of value emphases, but a scientifically balanced approach between axiological certainty, critical thinking, and openness to dialogue with the secular academic community, which will transform value-oriented disciplines into a transformative resource for modern higher education.

Conclusions

The analysis gives grounds to assert that the educational potential of value-oriented disciplines at the Ukrainian Humanitarian Institute is systematic in nature and is a substantial factor in ensuring the unity of teaching and education in higher education. This potential is not limited to the transmission of knowledge, but functions as a source of meaning, contributing to the formation of a holistic worldview and the self-determination of students. The implementation of the educational potential of value-oriented disciplines is based on the principles of Christian anthropology and is aimed at restoring the spiritual, moral and personal integrity of the individual. In this context, education appears not only as a mechanism for professional training, but also as a space for the formation of a mature personality capable of responsible choice, ethical thinking and conscious service to society.

A substantial characteristic of the system under study is the multidimensionality of its educational influence. The potential of disciplines was revealed, on the one hand, through a worldview search for meaning and the integration of faith and scientific knowledge, and on the other hand, through the professional and activity-based projection of values, in particular within the concept of servant leadership. This approach creates the conditions for training a new type of specialist who combines professional competence with a high level of ethical responsibility. The practical significance of value-oriented disciplines is evident in their applied nature and direct impact on the quality of life of students. Courses aimed at promoting a healthy lifestyle, financial literacy and psychological self-regulation have a positive impact on the physical, financial and psycho-emotional well-being of students, which significantly distinguishes them from purely theoretical educational components. At the same time, a key condition for the effectiveness of the entire system is the personal factor of the teacher as a mentor and bearer of declared values. The consistency between the proclaimed ethical principles and the personal example of the teacher determines the level of students' trust in the educational process; on the other hand, the gap between the declared values and actual practice, as well as problems of scientific verification and staffing, can lead to the discrediting of the content of education.

Prospects for further research can be seen in several key areas. First, it is necessary to conduct longitudinal monitoring of the impact of value-oriented disciplines on the professional careers and ethical behaviour of graduates in the long term. Second, the methodology for training teachers for such courses needs to be studied in detail, in particular, the development of mechanisms to overcome cognitive dissonance between religious worldviews and the modern scientific consensus in the natural sciences. Thirdly, a substantial area is the comparative analysis of the effectiveness of introducing an axiological component into the educational programmes of confessional and secular universities to identify universal strategies for shaping the moral resilience of young people.

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Аксіологічні виміри виховного потенціалу ціннісно орієнтованих дисциплін у вищій освіті

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Анотація. Стаття присвячена дослідженню виховного потенціалу ціннісно орієнтованих навчальних дисциплін (ВПЦНД) у контексті закладу вищої освіти з релігійним засновником. Метою статті було обґрунтування виховного потенціалу ціннісно орієнтованих дисциплін у закладах вищої освіти та визначення їх ролі у формуванні моральних і громадянських цінностей студентської молоді. У роботі розкрито сутність виховного потенціалу ціннісно орієнтованих дисциплін як інтегральної характеристики освітнього процесу, що забезпечує не лише трансляцію знань, але й світоглядну трансформацію особистості студента на основі християнської антропології та принципу «людина як образ Божий». В дослідженні здійснено аналіз двох ключових вимірів реалізації цього потенціалу, а саме світоглядного, що передбачало формування цілісного християнського бачення світу, у якому наука і віра розглядалися як взаємодоповнювальні способи пізнання, та професійно-діяльнісного, орієнтованого на виховання через концепцію лідерства-служіння і засади професійної етики. Особливу увагу приділено практичній значущості таких дисциплін для підвищення якості життя студентів, їх терапевтичній функції, а також розвитку soft skills й емоційного інтелекту. У статті також критично осмислювались потенційні ризики реалізації зазначеної системи, зокрема небезпека індоктринації та проблема так званого тепличного ефекту під час зіткнення випускників із реаліями секулярного суспільства. Обґрунтовано необхідність балансу між ціннісною формацією та розвитком автономного критичного мислення як умови зрілої особистісної і професійної ідентичності випускника. Запропонований підхід дозволив розглядати ВПЦНД як інструмент не лише виховання, а й підготовки студентів до відповідального суспільного служіння в умовах плюралістичного середовища. Результати дослідження можуть бути використані при розробці та вдосконаленні освітніх програм у закладах вищої освіти, орієнтованих на інтеграцію ціннісного та академічного вимірів освіти

Ключові слова: християнська антропологія; інтеграція віри й навчання; лідерство-служіння; світогляд; професійна етика; soft skills

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Innovative technologies as a means of high-quality training of specialists in higher education institutions

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Abstract. At the current stage of development of the national higher education system, innovative technologies are used as a means of high-quality training for competitive specialists, supported by regulatory documents. The purpose of the scientific article was to reveal the essence of innovations in education, demonstrate the role of innovations in the process of training higher education students, and outline the dominant factors of introducing innovative technologies into the educational process. To ensure the reliability of the research results, a set of scientific methods was used: analysis, synthesis, comparison, generalisation, observation, and the tabular method. The competency-based approach served as the methodological basis of the research. An analysis of scientific sources led to the conclusion that innovative technologies involve the introduction of new approaches into the content, goals,

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methods, forms, and organisation of educational activities. The variety of typologies of pedagogical innovations shows that they are not only tools for modernising the learning process but also act as fundamental factors in transforming the paradigm of professional training. The introduction of innovative technologies depends on organisational, managerial, socio-economic, pedagogical, psychological, and digital components. The quality of professional training in the context of innovative technologies is defined as a set of developed professional competencies, students' abilities for innovative activity, lifelong learning, critical thinking, and self-reflection, facilitated by an interdisciplinary approach to the learning process. Innovative technologies allow for achieving better programme learning outcomes; they intensify the development of abilities, creativity, and initiative; contribute to the formation of soft skills; ensure personalisation of learning and increase motivation; activate creative potential and form research interest; contribute to the openness of the educational system; and provide objective control of students' knowledge. The effectiveness of these technologies is determined by the digital educational environment, partnership relations, activity-and-competency-based forms of training, and the innovative culture of teachers. The practical value of the work lies in generalising the importance of innovative technologies in improving the quality of student education

Keywords: competency-based approach; professional competencies; innovations in education; personalisation of learning; quality of education

Introduction

The determining factors of high-quality training of future specialists are the compliance with international standards, competitiveness in the labour market and the ability to work effectively in changing conditions. This poses new challenges for higher education institutions and requires modernisation and improvement of the educational process, the use of innovative technologies that are based on modern scientific achievements and guarantee the effectiveness of the educational process. In 2021, the EU approved the Council Resolution on a Strategic Framework… (2021), where the European Education Area is considered in terms of promoting cooperation between Member States and stakeholders in order to provide high-quality, innovative and inclusive education and training, which will contribute to the economic growth of countries and the employment opportunities of graduates, as well as the social, cultural and personal development. In particular, the programme pointed out that innovations and new educational approaches to learning will contribute to better meeting the educational needs of applicants. In this regard, higher education institutions should create more opportunities for innovation, in particular through the implementation of initiatives by European universities, which in turn will contribute to improving the quality of higher education.

The theoretical foundations of the introduction of innovations into the educational process and the practical aspects of the use in improving the quality of higher education attract close attention of scientists. S. Tolochko *et al.* (2025) studied the current state of development of Ukrainian digital pedagogy in the conditions of digitalisation of educational institutions and distance learning through a review of the results of sociological surveys. Based on the results of the questionnaires and interviews conducted, the authors confirmed the unique role of digital pedagogy in formal, non-formal and informal education, its effectiveness in educational and scientific activities; analysed the essence, content, effectiveness of digital pedagogy in open education and established that this is a new branch of pedagogical science, the purpose of which is to use online and hybrid learning environments to improve individual learning, create a methodology that combines

digital tools to facilitate and enhance the effectiveness of educational and cognitive activities. The effectiveness of implementing hybrid communication training technology in the process of forming communicative competence during face-to-face, distance (synchronous, asynchronous) and blended learning was proven by L. Gutor & P. Sodomora (2024). N. Pavlova *et al.* (2024) experimentally confirmed the effectiveness of using gamification in the process of professional training of specialists using distance learning courses, where gamification was the object of study and a means of learning. S. Tolochko (2023) compared gamification and project activities as innovative technologies and indicated that the use of gamification technology ensures an increase in students' learning activity, intensifies the process of developing abilities, and forms a responsible attitude towards collective responsibilities.

The positive experience of implementing partner technologies (collaboration technologies), project technology, credit-modular and modular-rating technologies of education as pedagogical innovations in the process of professional training of masters in a higher education institution is presented in a monographic study by a team of authors led by L. Rebukha *et al.* (2022). A study conducted by A. Bratko *et al.* (2025) on the use of simulation methods in the process of studying professional disciplines in terms of improving the quality of professional training of future border guard officers, demonstrated the effectiveness of simulation training and professional development training, situational and simulation tasks, simulation analysis, "time management", cases, professional-business and plot-role-playing games. Research on the use of artificial intelligence tools in higher education by B. Klimova & M. Pikhart (2025) proves the change in the ways of interaction of students with academic and personal life, as well as the impact on the well-being of students and teachers, including academic, social and emotional aspects. The use of immersive technologies (virtual, augmented and mixed reality) has become a trend in the latest years in the formation and development of soft skills (communication, leadership, teamwork, empathy), as indicated in the study by A. Dubiel *et al.* (2025). The reviewed studies prove that innovative technologies create and provide tools for effective individual teaching and learning, improving the quality of education.

The aim of the article was to consider the concept of "innovation", typologies of pedagogical innovations; show the impact of innovative technologies on improving the quality of training of future specialists and the transformation of the educational process; to characterise the essence of the concept of "quality of professional training of future specialists in the aspect of the implementation of innovative technologies"; to show the advantages of innovative technologies and the main conditions for the application in the educational process.

Materials and Methods

The methodological basis of the scientific research encompassed elements of a competency-based approach, which allowed focusing on the competency dimension of the effectiveness of implementing innovative technologies in the professional training of specialists, namely, on the formation of professional abilities of higher education graduates to implement innovations, develop cognitive flexibility, critical thinking and skills for autonomous learning throughout life in rapidly changing conditions, assessing risks, problems in professional activity and choosing effective ways to solve these issues.

In order to organise the study of the selected topic, a set of general scientific and special research methods was used. Among the theoretical ones, the following were used: analysis – to study the categorical apparatus of the research, in particular the concepts of "innovation", "novelty", "novation", "innovation in education", "innovative technologies"; synthesis – to generalise the data obtained in the context of forming a holistic vision of the phenomenon of innovative technologies under study. The use of the terminological analysis method allowed determining key differences within the issues under study,

ensuring the representativeness of the source base and taking into account the latest trends in the development of scientific thought. Scientific methods, namely chronological and cause-and-effect analysis, contributed to the study of the impact of pedagogical innovations on the quality of training of specialists in higher education institutions. Comparison and generalisation were used during the analysis and systematisation of scientific sources, regulatory national and international educational documents, as well as to compare scientific views on the impact of innovative technologies on the results of the educational activities of higher education students, in particular the formation of skills to stimulate cognitive interest, motivation for learning, professional self-determination and self-development of students and the competitiveness in the labour market. Using content analysis, the study allowed characterising the current state of the problem, identifying the advantages of innovations in education and factors of effective application in educational practice. The main criteria for selecting literary sources were the relevance of publications, the scientific newness and value, practical significance, as well as regional coverage. The method of theoretical generalisation was used when formulating conclusions. The empirical component of the study was based on the author's own observations, conducted in 2025, of the process of introducing innovative technologies during the professional training of future specialists at the university. The results of the observation showed a change in the role of the subjects of the educational process, where the teacher became the organiser of the development of professional competencies of students. The observation was qualitative in nature and was used primarily to confirm and clarify previously formulated theoretical statements. A graphical method was used to illustrate different approaches to interpreting the essence of innovations. A tabular method was also used to visualise the diversity of classifications of pedagogical innovations.

The study materials included legislative and strategic documents, scientific publications, and monographs. The search was carried out through the method of systematic monitoring of relevant scientific publications in the leading international scientometric databases Scopus, Web of Science, Google Scholar and others using keywords that correspond to the purpose of the study. The use of a set of the above-mentioned scientific search methods ensured the reliability of the research results, as well as a comprehensive understanding of how innovative technologies affect the improvement of the quality of training of future specialists and the transformation of the educational process.

Results and Discussion

The issues of introducing innovations into the educational process of national higher education institutions are reflected in legislative and regulatory acts regulating the formation of the European Educational Space, in particular Law of Ukraine No. 1678-VII... (2014), Order of the Ministry of Education and Science of Ukraine No. 1501... (2023). As O. Lokshyna (2024) states, in the European Higher Education Space, the "quality" dimension involves focusing efforts on the formation and development of knowledge, basic, transversal abilities in students to build lives (critical thinking, digital competence, entrepreneurial competence, language learning, multilingualism, creativity, civic engagement).

The concept of "novation" comes from the Latin word *novatio* (change, renewal) and is the result of people's intellectual work. Innovation can be the result of fundamental, experimental, applied research in a certain field of human activity in order to improve its effectiveness. In conformity with D. Verbivskyi (2024), the concept of "novation" involves various forms of knowledge (new ideas, theories, discoveries, inventions, processes, models, structures, standards, methods, technologies, etc.). But not all knowledge has practical value, but becomes important when it is transformed into innovations that are able to renew productive forces, create prerequisites for technological or production changes. Only after being adopted for implementation and dissemination

does a novation acquire a new quality – it becomes an innovation. It is believed that innovation is a complex, multidimensional phenomenon that involves the introduction of new or significantly improved services, products, processes, or business models that create additional value for individual entities, organisations, and society as a whole.

S. Tolochko (2023) notes that innovations in education are a process associated with the creation, introduction, and dissemination of new ideas, means, methods, managerial and pedagogical technologies in the educational process, the result of which is an increase in the performance indicators of structural educational components, the transition of the system to another qualitative state. In conformity with D. Verbivskyi (2024), there are three most recognised approaches to defining innovations in Ukrainian pedagogical science. According to the first, innovations in education are changes based on novelties. The main indicator of innovativeness is newness, therefore any novelty will be an innovation. The criteria for assessing the effectiveness of innovation under this approach are both positive and negative changes in the educational process. The second approach considers innovations in education as the introduction of new concepts into the content, goals, forms, methods, as well as into the organisation of joint activities of subjects of the educational process. Within this approach, innovations in education are novelties that lead to positive changes in the relevant education system where such innovations are used. In line with the third approach, not any introduction of newness that optimises the education system can be considered an innovation. Innovation is the introduction of newness into the content and organisation, novelty is the introduction of new concepts only into the organisation of the process, and novation involves a new method, methodology, technology. Therefore, the differentiation of innovations in education is a difficult methodological task, which is due to the complexity of the concepts of "innovation", "pedagogical innovation" and "innovation in education", which causes the emergence of numerous classification lists. Pedagogical innovations are divided into types, based on various classification features (Table 1).

Table 1. *Classifications of pedagogical innovations*

Approach/characteristic underlying the classification	Types of pedagogical innovations
By technological approach	Productive (obtaining fundamentally new products); procedural (new methods of organising production)
By the level of pedagogical innovation	Innovations-modernisation (aimed at achieving guaranteed results within the traditional reproductive orientation of the educational process); innovations-transformations (directing the traditional educational process in the research direction and organising educational and cognitive activities)
By the intensity of innovative change	Innovations of the zero order (practically regenerate the primary properties of the system); innovations of the first order (characterised by quantitative changes in the system with its unchanged quality); innovations of the second order (regrouping of system elements and organisational changes are carried out); innovations of the second order (regrouping of system elements and organisational changes are carried out); third-order innovations (adaptive changes in the education system occur in new conditions without going beyond the previous education model); third-order innovations (adaptive changes in the education system occur in new conditions without going beyond the previous education model); fourth-order innovations (mainly contain a new solution); fifth-order innovations (initiate the creation of "new generation" education systems); sixth-order innovations (provoke the creation of new-type educational systems with a qualitative change in the functional properties while preserving the functional system-forming principle); seventh-order innovations (modernisation of the education system, during which its main functional principle changes)

Table 1. *Continued*

Approach/characteristic underlying the classification	Types of pedagogical innovations
By volume	Point, systemic, strategic
By range of implementation	Single (implemented in one place and solve a separate problem); diffuse (implemented on a large scale)
By structural components of the educational process	Instructional, educational, managerial
By scale of application	Large-scale (significantly change the goal, content, structure, and result of the educational process); local (significantly change the forms, methods, and means of teaching, upbringing, and management)
By areas	Psychological and pedagogical (novelties in instructional, educational and managerial processes); scientific and industrial (computerisation, telecommunications, material and technical equipment); socio-economic (personality development technologies, novelties in the legal support of the education system, novelties in the economics of education)
Depending on the scope of application	Innovations in the content of education, innovations in the technology of teaching and upbringing, innovations in the organisation of the educational process, innovations in education management, innovations in educational ecology
By the scale of transformations	Partial (local, single); modular (a complex of interconnected partial novelties); systemic novelties (covering the entire educational institution)
Depending on the innovative potential	Modification, combinatorial, radical or fundamental, global, basic novelties
Depending on the position in relation to its predecessor	Substituting, cancelling, opening, retro-introduction
Depending on the place of appearance	Novelties in science, novelties in practice
Depending on the time of appearance	Historical novelties, modern novelties
Depending on the level of expectations	Expected (planned) and unexpected (unplanned) novelties
Depending on the field of pedagogical knowledge	Educational novelties (in the field of education), didactic novelties (in the field of learning), historical and pedagogical novelties (in the field of history of pedagogy)
Depending on the structural elements of education systems	Novelties in the goal setting, tasks, content of education and upbringing, forms, methods, approaches, teaching technologies, teaching aids, in the diagnostic system, in control, in the assessment of results, etc.
Depending on the personal attitude of the subjects of education	Novelties in the aspect of developing the abilities of applicants and teachers, in the field of developing the knowledge, skills, abilities, means of activity, competencies
By field of pedagogical application	Novelties in the educational process, in the training course, educational sphere, at the level of the education system, in education management
By types of interaction between participants in the educational process	Novelties in collective learning, group learning, tutoring, educating, family learning
By functionality	Novelties-conditions, novelties-products, managerial novelties
By means of implementation	Planned, periodic, systematic, spontaneous, unplanned, accidental novelties
By the scale of distribution	Novelties in the activities of one teacher, association of teachers, in an educational institution, in a group of educational institutions, in the region, at the state level, at the international level
By socio-pedagogical significance	Novelties in educational institutions of a certain type, for certain professional-typological groups of teachers

Table 1. *Continued*

Approach/characteristic underlying the classification	Types of pedagogical innovations
By the volume of innovative activities	Local, global, mass novelties
By the degree of intended transformations	Corrective, modernising, modifying, radical, revolutionary novelties

Source: *developed by the authors based on L. Rebukha et al. (2022)*

Therefore, typologies of pedagogical innovations are proposed by scientists based on various classification features and most such typologies are based on classification systems of innovations and do not take into account the specifics of the field of education. The same innovation can be presented in different groups depending on which of its features is taken into account in a particular case. O. Prokopova *et al.* (2023) noted that methodological ideas about innovations in education (innovative processes in education, innovation dynamics, new knowledge) are of particular value. Such ideas can be introduced through methods and forms of learning, innovative technologies.

D. Verbivskyi (2024) argues that from the point of view of essential features, innovation should be considered as a result, process, system, activity, or technology (Fig. 1). As a process, innovation involves a change in the state of the system and a certain activity of a person, and innovation as a result is the reproduction (creation) of new concepts, which has a specific name "novation". Innovation as a system is the relationship between the components of the innovation process and the institutions that ensure it. Innovation as an activity is directly aimed at applying the results of scientific research. Innovation as a technology involves a significant improvement in the structure and quality of production. Therefore, innovation as a result is broader in content, as it includes a system, activity, process, technology and a specific product.

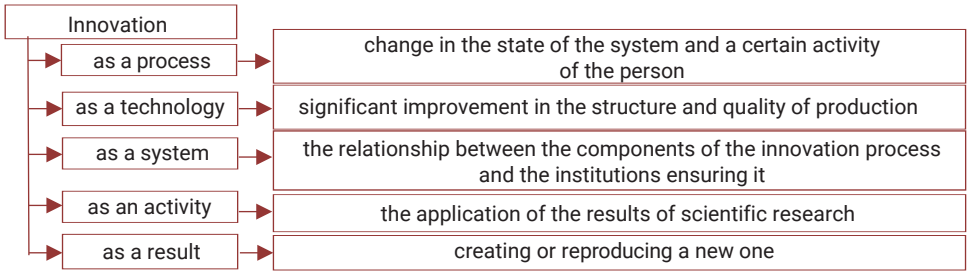

Figure 1. *Approaches to interpreting the essence of innovations*

Source: *developed by the authors based on D. Verbivskyi (2024)*

The concept of "innovation" is not stable and depends on what the scientist invests in its essence in a particular case, but a common feature of all concepts will be the introduction of new ideas into practice in order to achieve qualitative changes. L. Rebukha *et al.* (2022) argue that in the conditions of modernisation of education aimed at improving its quality, innovative learning technologies deserve the greatest attention, such as: digital, personalised adaptive learning, partner technologies (collaboration technology), which include interactive technology, training, project,

problem-based learning, game technology, case technology. The importance of implementing such innovative technologies as gamification and project activities during the training of students is emphasised by S. Tolochko (2023). The author's research focused on the positive results of using the aforementioned innovative technologies, namely, increasing learning effectiveness, visibility of the results of the work of all team members in gamification, the ability to use simple examples to explain complex phenomena and present various ways of presenting situations in order to understand the research problem in project activities. The researcher named the forms: educational games (intragroup or intergroup, matches of two teams, competitions, global digital didactic games), methods (research, creative, practice-oriented) and tools (templates and designers, mobile services and applications, presentations and videos, flash videos (intellectual games), videos, expeditions, reports), which are effective in terms of forming the competencies of students in gamification and project technology. O. Bulgakova & V. Zosimov (2023) studied the impact of gamification on independent and active learning, in particular, scientists proved that gaming activities contribute to improving the academic performance of students, create an inclusive online community for reviewing basic concepts, help establish effective interaction between teachers and students, etc.

The didactic capabilities of project technology allow students to independently master the material of several educational components. I. Buzhyna *et al*. (2023) believe that while working on a project, students not only acquire the necessary skills and abilities, but also form personal qualities that are important for effective socialisation of the individual. In project activities, students constantly use presentations and search for information on the Internet. Pursuant to O. Voloshyna & V. Zelinsky (2023), work on research projects contributes to the formation of a high level of professionalism of future specialists. M. Kozyar *et al*. (2023) note that project-based learning technology stimulates the formation of communicative, managerial, motivational and cognitive components of professional competence of future specialists, in particular officers.

In educational practice, project technology and gamification are successfully combined and contribute to the development of creativity, initiative, and interaction skills during group activities. This combination provides greater dynamism of the educational process, affecting both the motivation of students and the course of the process of forming the integral competence of future specialists. According to O. Patlaichuk *et al*. (2025), the combination of these interactive technologies provides the opportunity to create a flexible learning system that takes into account the individual characteristics of students, which contributes to greater inclusion of students in the educational process, the activity, and also allows for feedback. As noted by R. Gurevych *et al*. (2021), the development of the information society of the transformation of higher education is closely related to the introduction of modern information and communication technologies in order to increase the quantitative and qualitative indicators of the education sector and the effectiveness of learning. The digital transformation of education involves equipping higher education institutions with modern digital technologies aimed at increasing the accessibility of education and educational resources for students and teachers. One of the most significant positive features of the digitalisation of education is the possibility of diversifying forms and methods of learning, aimed at the needs of higher education students and taking into account the requirements of the labour market.

E. Mukul & G. Büyüközkan (2023) conducted a systematic review of the digital transformation of education and emphasised the challenges and opportunities for higher education institutions. With the digitalisation of the educational system, there are a sufficient number of predictions regarding its results: high-quality and full-fledged personalisation of the educational process;

support for sustainable learning motivation of students at all stages of the educational process; ensuring operational feedback with students, rapid and objective assessment of the learning outcomes during the performance of a specific educational task; the deepest possible integration of theoretical and practical learning, ensuring the project aspect of educational activities; significant reduction of periods of deployment, development, mastering of educational programmes; increasing information openness and transparency of the education system (Kremen *et al.*, 2022); ensuring an individual educational trajectory through the widespread use of electronic resources and modern control and diagnostic tools (Rebukha *et al.*, 2022).

The use of information and communication technologies significantly increases the efficiency of the educational process. Information and communication technologies include the use of the Internet, telecommunication networks, computers, software, audiovisual systems, multimedia materials, electronic learning tools, video conferences, which provide access to information, allow creating, storing, changing and transferring it. The implementation: contributes to a more thorough assimilation of knowledge and skills by students; develops a creative approach to educational activities in higher education students; provides objective control and testing of students' knowledge; contributes to the formation of personal qualities and professional competencies of students; allows for a differentiated approach to education. With the help of multimedia tools, the teacher has the opportunity to present educational information in various formats, such as text, animation, graphics, sound and video. The teacher independently chooses the forms and sequence of teaching the material and, in order to provide additional explanations of complex issues, can use videos created by other teachers.

Modern approaches to the organisation of the educational process demonstrate the high effectiveness of video content as a tool for implementing the concept of lifelong learning. Video-oriented learning should be considered as a pedagogical technology aimed at broadcasting the content of education through the integration of visual, audio and text components, which provides a multisensory experience for students. This technology is characterised by flexibility and variability, which creates opportunities, in particular, for the implementation of the microlearning strategy. The typology of video resources is quite extensive and includes demonstration, explanatory, case video, interactive and personalised materials. The methodological basis for the implementation of video learning is the principles of self-management, collaboration, contextualisation, and individualisation of the educational trajectory. At the same time, the effectiveness of such an approach correlates with the level of formation of self-regulation skills, in particular goal-setting and psycho-emotional stability, among students.

As noted by V. Rebenok & O. Torubara (2023), when teaching professional disciplines, information and communication technologies allow creating models of various phenomena and processes, simulating the operation of laboratory units and stands, conducting measurements, processing experimental results, obtaining instrument indicators using specialised sensors, building tables, diagrams, and graphs. Modelling programmes greatly facilitate the solution of various tasks by higher education students, and working with digital technologies allows activating students' creative potential, forming research interest and increasing cognitive motivation.

According to I. Krasnoshchok *et al.* (2023), the use of simulations, virtual reality, web conferences and other digital tools contributes to the development of critical thinking, communication skills, creativity, and cooperation in higher education students. During such classes, situations are created where future specialists can interact, make decisions, solve problems. Yu. Danylevych *et al.* (2021) proved that Internet methods are effective in training future specialists in higher education institutions, which provide significant

advantages during the organisation of educational activities due to the ability to independently search for the necessary information. The use of cloud technologies allows storing a significant amount of educational information, video conferences provide effective communication between the teacher and higher education students, and online platforms allow using various forms of monitoring the educational achievements of students. V. Kremen *et al.* (2022) concluded that immersive learning technology using augmented and virtual reality, voice interfaces, machine analysis of user actions, automation of educational processes, testing and learning results (with artificial intelligence), certification using blockchain technologies, inclusive technologies affect the implementation of the principles of open education, ensuring access to quality education for each student, improving distance learning, and implementing the idea of the Internet of Things. The use of artificial intelligence has significant potential for ensuring high-quality training of specialists in higher education institutions due to its ability to automatically process and analyse a large amount of data. In addition, according to O. Nalyvaiko (2023), the capabilities of neural networks allow for an individual approach to each student, to predict the student's learning trajectory, guided by the student's achievements and preferences in the learning process, etc.

The integration of artificial intelligence technologies into higher education is both promising and controversial. There is a strong consensus in the scientific community about the potential of artificial intelligence in increasing personalisation, optimising educational practices and promoting the development of digital competencies. However, there are also deep disagreements, in particular in ethical governance, readiness for implementation and institutional coherence. As pointed out by M. de la Fuente & G. Farhadian (2025), higher education institutions cannot afford to treat artificial intelligence as a neutral tool: its integration should be actively shaped on the basis of ethical foresight, inclusive management and social context, thus going beyond the boundaries of implementation, assuming transformational leadership in improving the quality of specialist training using the capabilities of artificial intelligence, while ensuring consistency with core academic values.

The active use of innovative technologies in the educational process of higher education is one of the promising opportunities for improving the professional training of future specialists, since such technologies are focused on the formation of professional competencies, individual development of students. The innovative technologies contribute to the intensification of educational activity, increasing motivation, and help overcome stereotypes and monotony in learning. Due to these capabilities, innovative technologies are an important component of effective and high-quality education.

Conclusions

The analysis of scientific approaches to determining the essence of innovations in education made it possible to find out that innovations in education are changes based on novelties; but it is not about any introduction of newness that improves the education system. The innovations also comprise the introduction of new concepts into the content, goals, forms, methods, and organisation of subject-subject activity. The latter statement most accurately reflects the essence of innovative technologies in the educational process. In the scientific literature, there are a significant number of typologies of pedagogical innovations, compiled on the basis of various classification features, but most typologies are based on classification systems of innovations without taking into account the specifics of the educational system.

Theoretical understanding of innovative technologies allows concluding that these technologies are not only tools for modernising the learning process, but also act as fundamental factors in transforming the concept of professional training of specialists in higher education institutions. The implementation directly

depends on the organisational and managerial, socio-economic, pedagogical, psychological, digital, and other components of the educational environment. Therefore, the quality of professional training of future specialists in the aspect of the implementation of innovative technologies is a set that combines highly developed professional competencies, the ability of subjects of the educational process to engage in innovative activity, an interdisciplinary approach to organising the learning process, critical thinking of higher education students, the desire to learn throughout life, self-reflection, etc.

Innovative technologies (digital, project, gamification, training, problem-based learning, case technology, immersive (virtual, augmented and mixed reality), blockchain technology, inclusiveness) in the educational process of training specialists allow achieving better programme learning outcomes; intensify the process of developing abilities, creativity, and initiative; contribute to the formation and development of soft skills (communication, leadership, teamwork, empathy); provide personalisation of learning and increase learning motivation; activate creative potential and form research interest; promote information openness and transparency of the education system; provide objective control and verification of students' knowledge, etc. The key determinants in the implementation of innovative technologies in the professional training system are the digital educational environment of a higher education institution, partnership relations between subjects of education, shifting the emphasis from reproductive forms of learning to activity-competence forms, ensuring activation and personalisation of the learning process, and the formation of an innovative culture of teachers. Prospects for further research on the selected topic will focus on the targeted selection of innovative technologies according to the programme learning outcomes of specific specialists.

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Інноваційні технології як засіб якісної підготовки фахівців у закладах вищої освіти

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Анотація. На сучасному етапі розвитку системи національної вищої освіти інноваційні технології використовуються як засоби якісної підготовки конкурентоздатних фахівців, що підтримується нормативними документами. Метою наукової статті було розкрити сутність інновацій в освіті, показати роль інновацій у процесі якісної підготовки здобувачів вищої освіти, окреслити домінантні чинники впровадження інноваційних технологій в освітній процес. Для забезпечення достовірності результатів дослідження застосовано комплекс методів наукового пошуку: аналіз, синтез, порівняння та узагальнення, спостереження, табличний метод. Як методологічне підґрунтя дослідження використано компетентнісний підхід. Аналіз наукових джерел дозволив дійти висновку, що інноваційними технологіями стало введення нового у зміст, цілі, методи, форми, організацію освітньої діяльності. Різноманітність типологій педагогічних інновацій засвідчили, що вони були не лише інструментами модернізації процесу навчання, а виступали засадовими чинниками трансформації парадигми професійної підготовки фахівців. Упровадження інноваційних технологій в освітній процес залежить від організаційно-управлінських, соціально-економічних, педагогічних, психологічних, цифрових складників. Якість професійної підготовки майбутніх фахівців у контексті впровадження інноваційних технологій визначається сукупністю сформованих професійних компетентностей, здатністю студентів до інноваційної діяльності, навчання впродовж життя, критичного мислення та саморефлексії, а також реалізацією міждисциплінарного підходу в організації навчання. Інноваційні технології дозволяють досягти кращих програмних результатів навчання; інтенсифікують розвиток здібностей, креативності, ініціативності; сприяють формуванню

soft skills; забезпечують персоналізацію навчання та підвищують навчальну мотивацію; активізують творчий потенціал, формують дослідницький інтерес; сприяють відкритості й прозорості освітньої системи; забезпечують об'єктивний контроль знань студентів. Ефективність упровадження інноваційних технологій у систему професійної підготовки обумовлена цифровим освітнім середовищем, партнерськими стосунками суб'єктів навчання, діяльнісно-компетентнісними формами навчання, активізацією та персоналізацією процесу навчання, інноваційною культурою викладачів. Практична цінність роботи полягає в узагальненні значення інноваційних технологій у контексті підвищення якості освіти студентів

Ключові слова: компетентнісний підхід; професійні компетентності; інновації в освіті; персоналізація навчання; якість освіти

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Large language models in training of philologists and translators

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Abstract. Digitisation of the education sector has modernised the need to determine the impact of large language models based on artificial intelligence on the professional training of philologists and translators. Use of these technologies has significantly modified the content and structure of educational components, the methodology for developing translation competence, and the requirements for modern translators in line with market needs. The study aimed to analyse the role of the use of large language models based on artificial intelligence in the professional training of future philologists and translators. The methodological basis of the scientific research was the methods of critical analysis of scientific sources on the subject under study and comparison of educational practices. The results of the research showed that the use of large language models for teaching foreign languages and translation contributed to the personalisation of learning, improved the accuracy and quality of translation, self-education of students, the development of their critical thinking and the automation of the process of assessing their performance. At the same time, a range of challenges and risks were identified in the application of these technologies in the educational process: inaccurate translation, direct dependence on technical infrastructure, non-compliance with the principles of academic integrity, and insufficient effectiveness in the formation of translation competence, especially general educational background knowledge. The study also established that the effectiveness of using large language models largely depends on the level of digital literacy of students and pedagogical support for their application in the educational process. The need to develop skills for the responsible and ethical use of artificial intelligence tools as part of the professional training of future translators has been emphasised. The

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practical significance of the conclusions is determined by the identification of ways to integrate large language models into the professional training of future philologists and translators

Keywords: digital competence; information technology; neural machine translation; translation studies; critical thinking; educational process; artificial intelligence

Introduction

Rapid development of information technology changed the worldview and influenced various aspects of human existence, particularly in the fields of linguistics and translation studies, and sparked interest in finding tools for fast, high-quality and mobile translation, leading to the development of artificial intelligence (AI) systems, which are likely to surpass humans in a few decades. The active introduction of AI technologies into education requires a rethinking of the content and methods of professional training of specialists in higher education institutions. In a context where digital tools not only complement traditional teaching practices but also significantly influence the formation of the professional competencies of future specialists, the training of philologists and translators is undergoing a transformation. In this context, research into the advantages and threats of using AI in the professional training of philologists and translators is becoming particularly relevant. The timeliness of addressing this issue is due to changes in the professional activities of translators, which are characterised by the widespread use of machine translation systems and language programmes. The modern translation services market has updated the professional requirements for translators, which now include not only the ability to speak foreign languages at a high level, but also to interact effectively with AI programmes, to have the skills to post-edit automated translations, to critically evaluate the results of intelligent systems, and to ensure the adequacy of intercultural communication. Despite the rapid development of artificial intelligence technologies, there is insufficient integration of these technologies into the training of philologists and translators, and a lack of comprehensive research aimed at determining the didactic conditions, pedagogical models, and principles for the effective use of intelligent systems in the professional training of philologists and translators. In addition, research requires ethical, cognitive and professional risks associated with the use of AI, which highlights the need for a scientifically sound approach to the implementation of intelligent systems as a tool for development. Based on the above, the relevance of research on the use of large language models based on AI in the professional training of philologists-translators is determined by social, professional and pedagogical factors and the need for theoretical determination and practical justification of effective approaches to its integration into the educational process.

L. Hunaza (2023) addressed the role of artificial intelligence in the education system, in particular ways to optimise the management of the educational process, individualise learning for pupils and students, and support teachers and lecturers. The modern educational and professional translation space is rapidly changing under the influence of AI, large language models (LLMs), and automated machine translation systems. This requires a comprehensive redefinition of traditional methods and approaches to translation training to adapt the academic training of philologists and translators to the requirements of the translation services market. O. Rumiantseva *et al.* (2025) noted the lack of a comprehensive theoretical and methodological framework for defining the impact of AI on translation studies and translation training in higher education institutions.

T. Hryhorenko (2020) and N. Liutianska (2025) concluded that modern AI and LLM mechanisms can handle complex, specialised tasks: determining

and processing natural human language and providing highly accurate, high-quality translation, as confirmed by a range of studies based on a comparative analysis of AI-powered translation services and the identification of their advantages and disadvantages. Studies by M. Jiménez-Crespo (2024) and T. Lee (2024) addressed a so-called "technological shift" in translation studies thanks to AI, which has not only modified the translation process but also re-evaluated the role of the translator. According to V. Kirov & B. Malamin (2022), the above factors have created unprecedented challenges and opportunities for translation studies. O. Kulyk (2023), researching the relevance of intelligent systems in improving the professional training of future translators, determined that LLMs can rapidly process large volumes of text and demonstrate significant progress in reproducing information while maintaining sufficient accuracy and naturalness of the text. However, in terms of pragmatics, expressiveness and imagery, there are significant limitations and difficulties, such as: lack of coordination, repetition of the same word, misunderstanding of context, and, consequently, the use of words in an inappropriate contextual meaning, literal translation, incorrect reproduction, which causes the loss of relevant information and distortion of the content of the source text, violation of the adequacy of linguistic formulation, pragmatic adaptation of the text. Similar views were expressed by A. Krasulia & M. Turchyna (2020), arguing that due to scientific and technological progress, AI tools make it possible to optimise translation, but cannot replace the translator as a human being. Despite the benefits of using LLM, namely corpus technologies, for translation, such as saving time, improving the language quality of texts and simplifying access to scientific communication, they also raise a wide range of ethical, stylistic and linguistic challenges, confidentiality and translation quality issues, reviving the problem of academic integrity. Researchers of AI-based translation methods for the Ukrainian language, I. Stebaiev & O. Kuzomin (2023) believe that it is necessary to highlight these processes in the mirror of philology, which studies the nature of language and text, and translation studies.

The study aimed to investigate the advantages and disadvantages of using AI-based LLM to develop the professional competencies of future philologists and translators. The research objectives were to characterise LLM as an innovative tool for foreign language and translation training; to identify the advantages and disadvantages of using this technology in the educational process; to analyse the impact of LLM on the transformation of translation studies as a field, outlining the state of LLM integration into educational and professional training programmes for higher education students majoring in 035 "Philology". The scientific novelty of the results obtained lies in identifying current trends and outlining the advantages and disadvantages of using LLM in the professional training of philologists and translators.

Materials and Methods

The research methodology is based on a comprehensive, systematic approach that encompasses theoretical and empirical research methods for a comprehensive analysis of the place of LLM in the structure of professional training for philologists and translators. The research material consisted of leading AI-based LLM and modern neural machine translation systems, such as ChatGPT-3.5, ChatGPT-4, Gemini, Claude, as well as specialised intelligent programmes DeepL and Google Translate. These programmes were used solely to summarise the results of the implementation of AI tools in the process of developing translation competence. To ensure academic integrity, the authors declare that none of the aforementioned AI tools were employed in the drafting or composition of this research paper.

The subject of additional analysis was the regulatory and educational documentation governing the use of AI systems in the educational sphere in Ukraine. In particular, during 2024-2025, research was conducted and documents such as the "National Strategy for the Development

of Artificial Intelligence in Ukraine 2021-2030", Recommendations for the Responsible Implementation and Use of Artificial Intelligence Technologies in Higher Education Institutions, and Regulations on the Policy for the Use of Artificial Intelligence at the National University of Life and Environmental Sciences of Ukraine. To determine the state of practical integration of AI tools, a comparative analysis of educational and professional training programmes for higher education students majoring in 035 "Philology", the syllabus of the educational component "Information Technologies in Translation", which is part of the educational professional programmes "English and a Second Foreign Language" and "German and a Second Foreign Language" for higher education students of the first (bachelor's) level in the specialty "Philology" at the National University of Life and Environmental Sciences of Ukraine was conducted.

A critical analysis of scientific sources and a review of the literature made it possible to study international experience in global educational practices, the theoretical foundations of AI's impact on the fields of linguistics and translation studies, and to find relevant information on the application of LLM in the training of philologists and translators. Methods of synthesis and generalisation were used to systematise information from documentary sources, which made it possible to clarify the categorical apparatus, in particular the definition of the term "large language model", to classify the advantages and risks of introducing LLM into education, and to formulate professional requirements for a modern translator. Comparative analysis was used to compare the translation results produced by AI systems such as Google Translate, ChatGPT 3.5/4, and educational practices recorded in the analysed documentation, to determine the optimal ways of their implementation in the domestic educational space, as well as to identify the effectiveness of neural machine translation compared to statistical models and traditional teaching methods. Quantitative and qualitative analyses helped to verify the accuracy, stylistic adequacy, and quality of translations performed by LLM.

Analysis of documentation, in particular individual policies on the use of AI in educational, scientific and innovative activities, educational and professional programmes, educational components, and pedagogical experience, was used to assess the effectiveness of the modernisation of the learning environment, the state of integration of AI systems into educational activities, and to summarise the results of the implementation of AI tools in the process of developing translation competence. In addition, the study considered the results of a survey of philology students regarding their experience with LLM and the impact of AI tools on their academic performance. This multidirectional approach ensured the realism of the conclusions and outlined promising ways to transform the methods of teaching philological and translation disciplines. The methodology was based on the principles of scientific reliability and academic integrity, providing a solid foundation for confirming the results obtained in the context of modern requirements for the professional training of philologists and translators.

Results and Discussion

The use of AI in linguistics and translation studies opens new prospects for faster information processing, streamlining the translation process, and improving the accuracy and quality of reproduced texts, while at the same time causing a range of professional, ethical, and technological challenges. LLM research for translation addresses the task of ensuring its quality in line with the requirements of the modern translation services market and is driven by the following factors: the ever-growing demand for translations; the possibility of building highly efficient translation models through the cooperation of AI and machine learning; the need for further analysis of the grammar and vocabulary of languages due to their complex structure; international communication, which requires highly accurate translations; support for Internet content in different

languages; the availability of large-scale models to a wide range of users, which increases their relevance and realises their potential.

For a more in-depth coverage of the research topic, the concept of "large language models" has been specified. A large language model or large language model is defined as an algorithm that can determine "how likely a sequence of words is to be a valid sentence" (Tolochko *et al.*, 2023). Their development is associated with the use of an algorithm for determining the structure of input and output languages. LLMs can detect and systematise emotional states and feelings in a given text; they are trained to identify such text properties as positivity, negativity, and neutrality (Yurchak *et al.*, 2024). LLMs are closely intertwined with neural networks trained on large amounts of labelled text through self-supervised or semi-supervised learning. In contrast to AI in the broad sense, LLMs are a subsystem focused on working with language, in particular, natural language processing. Such algorithms are trained on large datasets to perform their main purpose: to determine human language contextually and grammatically correctly, respond to it, create texts, and interpret information correctly. LLMs are not without flaws, which prevent them from being considered general artificial intelligence. The risks of using large language models are outlined below. First, LLMs can make mistakes in data analysis, leading to incorrect conclusions and decisions, which points to the need for careful verification of the generated results. Second, the processing of large amounts of data by LLMs can lead to privacy violations. Information that should remain confidential may be publicly accessible during data analysis. To prevent this, a privacy policy must be established. Thirdly, LLMs are dependent on the model provider and their infrastructure, as a number of LLM providers offer their services in the cloud. This can be a problem for users if they lose access to services or if pricing policies change. Fourthly, ethical issues and responsibility regarding the use of LLMs should be considered. These models can be used to create false content or spread harmful content, so users must use them carefully and responsibly.

After training, the systems are suitable for performing a range of neurolinguistic programming tasks: developing chatbots for maintaining conversations, including ChatGPT; generating texts describing products, blog posts and articles; providing answers to frequently asked questions and directing customer enquiries to the appropriate specialist; analysing user feedback via email, social media posts, and product reviews; translating texts into different languages; classifying and categorising large amounts of text data for more efficient processing and analysis (Tolochko *et al.*, 2019). LLMs such as ChatGPT, GPT-4, Claude, and Gemini have become available to a wide range of users and have begun to be actively used in education and translation. In the era of digitalisation and information and communication technologies, a substantial area of educational activity is the introduction of large language models into the training of philologists and translators.

As I. Zmiiova & I. Panenko (2025) noted, the translation competence of a modern translator must encompass traditional linguistic skills and digital literacy. The emergence of neural machine translation systems and other AI applications requires specialists to be familiar with their operation and to be aware of their limitations. Translation competence models include technological (instrumental) sub-competence, which focuses on "procedural knowledge of the use of documentary resources and information technologies applied to translation" (Ramírez-Polo & Vargas-Sierra, 2023). According to the European Commission (n.d.), modern specialists must be familiar with "basic knowledge of machine translation technologies and be able to use them according to their needs". The diversity of approaches in different countries to the training of higher education students in the context of interaction with LLM necessitates research into ways of integrating them into the educational space.

Scientists identified the following areas for implementing LLM in the educational process:

management of the educational environment, including personalisation of learning, analysis of educational institutions, monitoring of the quality of educational services, and creation of training courses; pedagogical design (development of work programmes, lesson plans, educational component modules); composition of educational content (generation of lecture texts, their visualisation, creation of multimedia materials, exercises and tasks for ongoing and final assessment of students' knowledge); proctoring, which provides control and monitoring during remote exams and tests, and also serves as a tool for organising group work among students (Khairulina, 2024). An analysis of current publications shows an emphasis on adaptive learning systems that can analyse students' learning progress in real time, identify their strengths and weaknesses, and adjust the content of the learning process. In situations where a student does not determine certain topics or terms, the system can explain them, provide examples and additional tasks; prompt feedback helps to eliminate errors, increasing the level of knowledge and skills.

A survey of future philologists conducted by M. Imran *et al.* (2024) shows significant progress in their academic performance thanks to the ability to receive individual assignments and comments on mistakes. The students also emphasise the advantages of round-the-clock access to LLM and the intuitiveness of their interfaces, which can be used for learning at a desired pace. The researchers emphasise that AI demonstrates greater flexibility and effectiveness compared to traditional methods, which are based on a uniform approach to all students. Pedagogical experiments confirm the effectiveness of using LLM in foreign language teaching. O. Ostapovych *et al.* (2023), analysing challenges and opportunities of using LLM-based AI systems in the training of language and translation specialists in higher education institutions based on pedagogical experience in teaching information technology and philological disciplines using ChatGTP, highlighted weaknesses of LLM in the training of philologists-translators, the risks of their use, and their insufficient effectiveness in the formation of translation competence, in particular general educational background knowledge. The analysis of scientific publications contributed to the development of methodological guidelines for the correct and ethical use of AI systems in educational and translation practice; justified the concept of the fundamental compatibility of their use, using ChatGTP as an example, within the norms of academic integrity, both to improve students' academic performance and to develop their critical thinking and optimise the use of time and resources. The conclusions emphasise the need to combine the use of LLM in real time with the design of methods for complex creative tasks to prevent plagiarism and increase the proportion of live foreign language communication in the teaching of language and translation components. At the same time, the ability of AI to generate textual information in the context of the practice of written translation of highly specialised, terminologically rich texts, provided that careful post-editing and correct, academically sound references to source material are used, is highly appreciated.

LLMs can generate exercises and test tasks for translating industry-specific texts of the appropriate level of complexity, analyse translations in various dimensions, highlight key terminology and create glossaries, which contribute to determination of specialised concepts. In addition, students can receive draft translations for further self-editing, analyse mistakes and use automatic recommendations for their correction. The use of machine translation promotes the development of critical thinking and builds the ability to work with texts of varying complexity, paying attention to context and style. At the same time, students express concern about the risk of dependence on digital technologies and a decline in the creative component of translation.

The introduction of generative models (GPT, ChatGPT) and professional platforms increases motivation to learn, promotes reflective activity among students, and has a positive impact on

their academic performance. LLM technologies provide access to large arrays of professional texts, ensuring the relevance of translations; students can work with large volumes of materials on various topics and in various styles that correspond to current trends in terminology development. Text analysis using AI can be used to select most appropriate lexical and stylistic solutions to improve the quality of the translated text. AI-based LLMs have transformed the way natural language is processed, providing machines with the ability to interpret and generate human language with unprecedented accuracy, which has led to the emergence of many applications in various fields. One of the most popular and useful applications of LLM is machine translation, which aims to automatically translate text or speech from one language to another. LLMs, particularly Google's T5 and OpenAI's GPT series, have delivered impressive results in the field of machine translation, helping to remove language barriers and enhance cross-cultural communication (Google Cloud, n.d.).

The above prompted researchers to carefully evaluate the effectiveness and accuracy of translations using LLM. Scientists compared two-way translations of academic abstracts from English into Arabic and vice versa, performed by machine translation (Google Translate) and LLM, in particular ChatGPT 3.5 and 4. The results of quantitative and qualitative analysis showed higher translation quality of LLM tools in both directions. In addition, ChatGPT 4 outperformed ChatGPT 3.5 in Arabic-English translation, while no statistically significant difference was found in translation from English to Arabic. Qualitative analysis demonstrated that LLM tools can interpret contextual nuances, recognising proper nouns, and adapting to the style of the target language, while demonstrating limitations in reproducing certain contextual aspects and often translating specific terms literally (Mohsen, 2024).

Most statistical machine translation models have traditionally used the idea of training on parallel translation examples, but research into self-supervised and multi-task learning methods has expanded the range of possibilities for machine translation models, leading to the emergence of LLMs. In addition to performing universal translation functions, LLMs can, in principle, handle any natural language processing task, provided they have a sufficient number of examples for a particular task. Although LLMs can now either completely replace or partially supplement traditional machine translation models, the limits of their capabilities and the methods used for translation in multilingual tasks leave much room for research (Ataman *et al.*, 2025; Elhamayed & Nour, 2025).

Discussions are ongoing regarding the strategic integration of machine translation with LLM to develop more reliable and contextual solutions for natural language processing. LLM demonstrates significant achievements in performing complex tasks thanks to improved text generation and close human-machine interaction, which significantly increases the accuracy and efficiency of translation. Further scientific research should focus on improving the adaptability of LLM to various linguistic environments and improving the ways in which humans and machines interact to meet practical translation needs (Wang *et al.*, 2024). Neural network translation models serve as the basis for today's most popular machine translation systems, replacing outdated statistical and rule-based approaches. In particular, the Transformer architecture can accurately reproduce complex syntactic structures while accounting for context. The Transformer architecture laid the foundation for LLM by introducing self-control mechanisms that improved interpretation and presentation of complex language patterns. This technological advance prompted the development of more technologically advanced models, most notably OpenAI's well-known GPT (Generative Pre-trained Transformer) series, Google's BERT (Bidirectional Encoder Representations from Transformers) and Google Brain's T5 (Text-to-Text Transfer Transformer). Each subsequent generation of these

models has been characterised by improved performance and capabilities, mainly due to the continuous growth in the amount of training data, computing resources, and improvements in model architecture. LLMs such as GPT-4 are a notable example of AI excellence in human language interpretation and generation.

Notably, neural machine translation systems have sparked heated debate in the media, with some media outlets reporting that certain professions, including translation, are at risk of disappearing. However, a comparative study by J. Moorkens (2018) on the effectiveness of neural and statistical machine translation in several language pairs, the results of which were compared based on adequacy and productivity of post-editing, as well as the nature of errors, proved such statements to be unfounded. Although there has been an improvement in the stylistic features and word order in texts reproduced using neural machine translation, users of these services encounter certain unpredictable problems, sometimes related to omissions and inaccurate translation of individual elements of the original text (Chernovatyi, 2022).

Y. Chang *et al*. (2024) analysed the performance of three programmes – DeepL, Google Translate and GPT – in the context of translating texts of various genres (scientific, journalistic and literary), showing in which areas automatic translators work most effectively and where human intervention is indispensable. The most accurate translation results were documented in technical and journalistic texts, where it is necessary to preserve the accuracy of the content. At the same time, the programmes encountered significant difficulties in translating literary texts: they were unable to reproduce irony, stylistic colouring and wordplay. The researcher emphasises that the quality of translation correlates with the training corpus and the subject matter of the text: the programme performs much better in familiar domains than in specialised or unfamiliar areas, which leads to the conclusion that neural network translation models are relevant tools in modern translation practice. The most promising implementation of a neural network was ChatGPT (Generative Pre-trained Transformer), created by the OpenAI laboratory on 30 November 2022. The Ukrainian community gained access to the model the following year. This LLM functions in a dialogue format and supports queries based on natural language and chatbots. This neural network differs from other chatbots in that it "remembers" the answers and questions of the interlocutor in a given conversation and can maintain a consistent and coherent dialogue.

N. Akop'iantz (2023), based on the results of experiment at the Educational and Methodological Laboratory of the Department of Business Foreign Languages and Translation at NTU "KhPI", asserts a significant increase in the productivity of higher education students using ChatGPT as a supplementary tool, implemented in the educational process within a focus group of students majoring in 035 "Philology" (educational programme – "Philology. Germanic Languages and Literatures (including translation), first – English"). The thesis on the possibility of using the specified LLM for teaching English and translation is shared by other researchers, such as L. Dovhan (2023), L. Bohuslavska *et al.* (2024), and O. Boiko *et al.* (2024), analysing how this technology can optimise the educational process and improve students' speech activity results. The ChatGPT model helps students improve their oral and written communication skills, listening comprehension, interpretation of foreign-language texts, expansion and activation of their vocabulary, and accuracy in the use of grammatical structures. The above emphasises the importance of innovative technology in the context of philological and translation studies.

Below are some aspects of LLM use in the context of research. The combination of large databases and AI technologies can create interactive learning platforms for working with texts in real time, the ability to compare different translation options, and receive guidance on selecting the most appropriate equivalent, which will

ultimately contribute to the identification of various approaches to text translation and the selection of the most successful solutions. As mentioned above, neural machine translation is widely implemented in the training of translators, thanks to the system's ability to quickly and accurately reproduce large volumes of text. Google Translate, DeepL, Microsoft Translator, and Systran are the most common tools for processing texts. For example, Google Translate supports over 100 languages and can be used to quickly compare the automatic translation with the original. Despite convenience and high speed, the system may not be able to reproduce complex industry texts correctly, while DeepL is distinguished by high-quality text translation thanks to neural networks, but it supports a limited number of languages. At the same time, Amazon Translate can be used for large amounts of text in combination with other AWS tools, while Systran ensures accurate translation of technical and business texts, although it is expensive and less accessible to students.

It is worth highlighting the significant advantages of an AI-based intelligent learning system such as ChatGPT in translation training. This technology interprets grammatical rules, explains complex aspects of syntax, morphology, and the peculiarities of article usage and verb tenses, which improves mastery of grammatical structures and their appropriate selection in translation practice, while commenting on lexical, grammatical, and stylistic errors and the correct use of terms; generates exercises and test materials incorporating the characteristics of industry-specific texts; offers machine translation resources, terminology databases and electronic dictionaries; facilitates discussions and debates on the stylistics and genre features of texts; analyses individual translations and provides personal recommendations (Lee, 2024; Kutsak, 2025; Protsyshyn, 2025).

Despite significant benefits, ChatGPT has limitations: misinterpretation of context, dependence on the quality of input data, inability to incorporate individual experience of the student, probability of errors in the translation of highly specialised terms, and risks regarding the ethical compliance of information. These shortcomings should be incorporated when using ChatGPT for educational purposes to ensure a sustainable balance between its capabilities and limitations. A useful and productive AI-based online resource for translation training is Grammarly, which can be used to edit foreign-language texts, identifying and correcting numerous language errors and developing critical analysis skills for personal texts. Automated translation assessment systems provide speed and objectivity in analysis, but do not always incorporate contextual nuances, the translator's style, and cultural subtleties in texts. Therefore, it is advisable to combine them with traditional methods of expert analysis.

The results of an empirical study on the effectiveness of using AI in teaching professional text translation show that higher education students who used AI achieved better results than those who relied on traditional methods. In particular, 85% of respondents noted the positive impact of AI on the speed and accuracy of translation, and experimental data recorded 20-30% better results compared to traditional approaches. Other benefits of using AI in the context of professional education for translators include the individualisation of the educational process, access to large databases of texts and interactive tasks, and the development of translation skills and abilities. At the same time, the use of AI-based tools is not without significant challenges, such as technological dependence, difficulties in adapting students to a new type of learning, imperfections in automatic assessment systems, and insufficient social interaction. Additional difficulties in implementing LLM in the educational process include the low level of technical support in educational institutions, insufficient digital literacy among teachers and students, and the need to adapt educational and professional programmes to the conditions of digital transformation. Therefore, the use of LLM in the professional training of philologists and translators has significant advantages over traditional approaches, but

requires comprehensive, balanced and methodologically sound implementation. AI technologies save time and help overcome language barriers, but they are still unable to serve as a benchmark equivalent to a human translator. The most promising area of their use in translation is the combination of automatic translation with subsequent editing and control by a human.

The development of AI technologies, coupled with the low level of technical support in higher education institutions and the lack of digital literacy among academic staff and students, has led to other challenges and threats in the education sector: disregard for academic integrity standards; the lack of clear guidelines regulating the use of AI in terms of references to texts created with the help of LLM; the complete or partial threat of information falsification. In view of the above, each country is developing individual policies for the use of AI technologies to prevent the above-mentioned risks and threats. The Institute of Artificial Intelligence Problems of the National Academy of Sciences of Ukraine has developed the "National Strategy for the Development of Artificial Intelligence in Ukraine for 2021-2030", the only national regulatory document that addresses the issue of AI use in science and education (OECD, 2021).

Analysis of research on the identification of shortcomings in the education system at the global and national levels justifies the urgent need to define clear guidelines for the implementation of AI-based LLM in the educational process. Responding to this challenge, the Ministry of Education and Science of Ukraine (2025) has developed "Recommendations for the responsible implementation and use of artificial intelligence technologies in higher education institutions", which methodically accompany the proper use of AI tools in higher education institutions, primarily in educational, scientific, and innovative activities. The document will be useful for heads of higher education institutions, structural units, teachers, and students and is helpful in the following areas: creating high-quality prompts, listing the necessary AI tools for generating and checking tests, developing presentations, analysing students' academic achievements; searching for information, preparing for exams, generating ideas for presentations and creative works, receiving feedback on completed tasks, and studying languages.

The development of these guidelines was also driven by the public need to reform educational institutions and increase their competitiveness, as the introduction of AI technologies is updating approaches to learning that meet needs and demands of the labour market. In turn, higher education institutions are drafting unique regulatory documents on the principles of using AI technologies based on the published recommendations. For example, Regulations on the Policy of Using Artificial Intelligence at the National University of Life and Environmental Sciences of Ukraine (2024) regulates the use of artificial intelligence in educational and scientific activities, without neglecting ethical aspects. The authors of the document outline the following prospects for the use of AI in the university's educational activities (Table 1).

Table 1. *Prospects for the use of AI in education*

Prospects for the use of AI	Content and educational opportunities
Individualisation of the student's educational trajectory	Ensuring a personalised approach to the education of each higher education applicant
Automated assessment system	Optimisation of the process of assessing the academic achievements of higher education students using AI, reducing the workload of academic staff, and ensuring the objectivity and accuracy of assessment
Production of innovative teaching materials	Creating educational integrated learning materials for more engaging and effective learning and self-education
Development of virtual assistants for learning	Support and assistance in solving problems

Source: *compiled based on Regulations on the Policy of Using Artificial Intelligence at the National University of Life and Environmental Sciences of Ukraine (2024)*

A review of scientific literature confirms the active integration of LLM into the system of translator training, however, researchers emphasise the significance of mandatory pedagogical support for this process, the creation of methods for developing the digital competence of future translators, and the development of knowledge, skills, abilities and qualities relevant to contemporary translation activities, which will contribute to their readiness to work in a digital professional environment (Pylypiuk, 2024). S. Poltavskyi (2025), analysing the problem of developing the information and communication competence of future translators based on the development of digital technologies and the emergence of LLM, demonstrated the relevance of the consistent integration of AI tools into the content of professional training for translators and points to the need to review the content of educational programmes. The researcher identified three primary pedagogical conditions for the effective formation of digital competence in future philologists and translators: 1) the introduction of LLM technologies into the content of training; 2) the formation of critical thinking in working with AI tools; 3) the design of an active practice-oriented educational environment.

An analysis of educational programmes offered by educational institutions has shown that linguistic and translation studies programmes include modules aimed at teaching future translators how to use LLM and automated translation systems. These modules cover topics such as the history of LLM and automated translation, various translation systems and tools, parameters for evaluating the quality of translated materials, and include practical exercises using large language model systems and automated translation. Ukrainian translation scholars V. Karaban & A. Karaban (2025) emphasise the need to review the paradigm of translator training in Ukraine, due to two factors: the spread of LLM in the activities of global language services and the need to harmonise the Ukrainian system of translator training with European Union standards. Commenting on this issue, the study addressed opportunities for higher education institutions to modernise their curricula to meet technological requirements.

Using quantitative and qualitative indicators to assess the effectiveness of modernising translator training, researchers analysed the master's degree programmes in translator training at Taras Shevchenko National University of Kyiv, Ivan Franko National University of Lviv, and V.N. Karazin Kharkiv National University to determine whether they focus on theoretical research or give preference to the development of practical translation skills. The degree of integration of AI technologies into the educational process (e.g., machine translation, post-editing) and project management components following industry needs was emphasised. The results indicate the limited availability of modules on machine translation and post-editing (Karaban & Karaban, 2025).

The educational and professional programmes "English and a Second Foreign Language" and "German and a Second Foreign Language" for second-level (master's) higher education students majoring in 035 "Philology" at the National University of Life and Environmental Sciences of Ukraine (NULES, 2024a) differ from the above-mentioned documents. Their uniqueness is explained by thorough theoretical and practical training in philological disciplines, which is organically combined with the mastery of modern information technologies in the translation industry for their use in practical activities with a focus on the agro-industrial sector. One of the mandatory educational components of educational and professional programmes of the special (professional training) cycle is "Information Technologies in Translation". The aim of studying this discipline is to develop comprehensive skills and abilities in higher education students regarding the systematic and complex use of translation automation tools to produce high-quality translations in a short time, as well as the design and use of electronic information resources for the

development of structured teaching materials (NULES, 2024b). A review of the educational documentation indicates the integration of limited modules or individual courses on machine and automated translation into educational professional training programmes for translators and the absence of training disciplines in post-editing of translations, which does not meet the needs of expanded integration of AI into the educational process and the training of future philologists and translators in the era of automation.

Conclusions

The results of the study show that AI-based LLM, despite its rapid development and accessibility to a wide range of users, is not capable of completely replacing a professional translator, but serves as an auxiliary tool that facilitates and speeds up the translation process. It has been proven that modern artificial intelligence language models have significant potential in the professional training of future philologists and translators, provided they are used in a targeted and methodically sound manner, as they contribute to improving the quality of education and developing translation skills. The integration of such technologies ensures the personalisation of the learning process, the optimisation of translation activities, expands access to interactive learning resources and develops critical analysis skills for reproduced texts.

Analysis of empirical studies has revealed higher efficiency in learning material when an AI-based LLM is used correctly. In addition, such tools are in demand for developing learning tasks, analysing errors, and creating glossaries. At the same time, the use of AI systems does not devalue the role of the teacher but rather emphasises their role as a mentor and organiser of the learning environment. At the same time, several problems have been identified in the use of LLM in the context of professional training of future philologists and translators: the risks of uncritical use of automated results, inaccuracies in translation, the dependence of higher education students on digital technologies and a reduction in the creative component of translation activity, and students' disregard for the principles of academic integrity. These risks can be overcome through well-thought-out methodological support and training students in the responsible use of LLM. An assessment of the effectiveness of modernising the learning environment based on an analysis of educational and professional training programmes for higher education students majoring in philology indicates the need to introduce modules or individual educational components aimed at teaching future translators approaches to neural machine translation and the basics of post-editing translations. Further prospects for scientific research involve the expansion of the use of LLMs in training philologists and translators, improving translation technologies, and increasing their capabilities while preserving the role of humans in the translation process.

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Великі мовні моделі в підготовці філологів-перекладачів

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Анотація. Невпинна цифровізація освітньої галузі осучаснила потребу в осмисленні впливу великих мовних моделей на базі штучного інтелекту на професійну підготовку філологів-перекладачів. Використання означених технологій істотно модифікувало зміст і структуру освітніх компонентів, методику формування перекладацької компетентності і вимоги до сучасного перекладача відповідно до потреб ринку. Мета наукового дослідження – вивчення ролі використання великих мовних моделей на основі штучного інтелекту у процесі професійної підготовки майбутніх-філологів перекладачів. Методологічним підґрунтям наукової розвідки слугували методи критичного аналізу наукових джерел з досліджуваної проблематики, порівняння освітніх практик. Результати дослідження засвідчили, що використання великих мовних моделей для навчання іноземних мов і перекладу сприяло персоналізації навчання, покращенню точності і якості перекладу, самоосвіті студентів, розвитку у них критичного мислення та автоматизації процесу оцінювання результатів їхньої успішності. Водночас виявлено низку викликів і ризиків у застосуванні означених технологій в освітньому процесі: неточний переклад, безпосередня залежність від технічної інфраструктури, недотримання принципів академічної доброчесності, недостатня ефективність у формуванні перекладацької компетентності, особливо загальноосвітніх фонових знань. Також встановлено, що ефективність використання великих мовних моделей значною мірою залежить від рівня цифрової грамотності студентів і педагогічного супроводу їх застосування в освітньому процесі. Наголошено на необхідності формування навичок відповідального й етичного використання інструментів штучного інтелекту як складника професійної підготовки майбутніх перекладачів. Практичне значення отриманих висновків полягає у визначенні шляхів інтеграції великих мовних моделей у професійну підготовку майбутніх філологів-перекладачів

Ключові слова: цифрова компетентність; інформаційні технології; нейронний машинний переклад; перекладознавство; критичне мислення; освітній процес; штучний інтелект

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Environmental education as an innovative pedagogical strategy for sustainable development: A case study of teacher training

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Abstract. The article presented the results of an empirical study examining the potential of environmental education as an innovative pedagogical strategy for sustainable development within the system of training future teachers. The aim of the study was to analyse the effectiveness of a series of guest lectures involving international (European Union countries and the United Kingdom) and Ukrainian practitioners and researchers as a tool for implementing the principles of education for sustainable development, lifelong learning, and universal design for learning. The research was grounded in a mixed qualitative-quantitative approach, employing a case study as the primary methodological design. The empirical basis was an educational case study conducted by the Department of Botany, Ecology and Horticulture at Bohdan Khmelnytsky Melitopol State Pedagogical University (Ukraine), within a series of ten hybrid-format guest lectures was implemented during 2025. The study involved 350 participants, including students of pedagogical specialities, academic staff, and representatives of other educational institutions. To assess the impact of the educational intervention, a pre-test/post-test questionnaire design based on a five-point Likert scale was applied. The results were analysed using descriptive statistics and Wilcoxon's non-parametric signed-rank test for dependent samples. The findings demonstrated statistically significant positive dynamics in participants' awareness of environmental education and sustainable development, their attitudes towards lifelong learning, and their readiness to implement inclusive and innovative pedagogical practices. Comparative analysis revealed that students showed greater increases in motivation and knowledge, whereas teachers demonstrated a higher level of readiness to integrate the acquired experience into their professional practice. The practical value of the study lies in the possibility of applying its results by higher education institutions and teacher training centres for designing and implementing sustainable, inclusive, and innovation-oriented professional development programmes

Keywords: education for sustainable development; universal design for learning (UDL); lifelong learning; guest lectures; training of future teachers; pedagogical innovations

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Introduction

Global environmental changes, climate instability and growing social risks are transforming the role of education in modern society. Educational systems can no longer be limited to the transfer of knowledge – they must develop sustainable development competencies, critical thinking skills, adaptability, and readiness to act in conditions of uncertainty. This issue is particularly relevant in the training of future teachers, as they are the conduits of environmental and social values in the school environment. In the context of crisis transformations and the digitalisation of the educational space, environmental education is emerging not only as a substantive component of teacher training, but also as an innovative pedagogical strategy capable of ensuring the integration of the principles of sustainable development, inclusiveness and flexibility in learning.

Contemporary international research confirms the need for the systematic integration of education for sustainable development (ESD) into higher education. J. Holst *et al.* (2024), analysing the implementation of SDG 4.7, found that teacher training is a critical factor for the successful implementation of sustainable development, but in most countries the integration of ESD remains fragmented. The authors emphasise the need to move from declarative programmes to practice-oriented learning models. H. Bui *et al.* (2024), researching the capacity of universities to implement the Sustainable Development Goals, concluded that the effectiveness of ESD depends on institutional support, interdisciplinarity and the use of innovative educational formats. The researchers emphasise the importance of active learning methods for the formation of long-term competencies.

The issue of forming sustainable development competencies in higher education was also considered by A. Annelin & G.-O. Boström (2024). In their proposed model for supporting sustainability competence, they demonstrated that inter-institutional interaction and reflective educational practices contribute to the transformation of the professional attitudes of future specialists. Similar results were presented by X. Qu & B. Cross (2024), who showed that inclusive learning design increases student engagement and promotes deeper learning. Contemporary research pays particular attention to universal design for learning (UDL) as a tool for ensuring inclusiveness. J. Griful-Freixenet *et al.* (2020) empirically proved that the implementation of UDL principles in teacher training programmes has a positive effect on teachers' readiness to work with diverse groups of learners. The research confirms that the integration of UDL promotes the development of pedagogical flexibility and professional reflection.

Research by N. Ullah *et al.* (2021) shows that digital learning environments increase student engagement when integrated into a sustainable development strategy. Empirical studies of interactive learning formats also confirm their effectiveness. A. Alshahrani (2024) proved that involving guest experts in the learning process increases motivation and promotes the connection between theory and professional practice. M. Ma (2025), analysing the strategic use of guest lectures, found an increase in students' academic activity and communication skills. The pedagogical value of guest lectures in strengthening professional readiness has also been confirmed by D. Pepple *et al.* (2025), who, drawing on Self-Determination Theory, demonstrate that structured interaction with external professionals enhances students' intrinsic motivation, employability skills, and professional self-efficacy. Their empirical findings indicate that exposure to real-world expertise contributes to the development of communication competencies and applied knowledge, which directly correlates with the increased readiness for professional practice observed in the present study.

In the Ukrainian scientific community, the issues of sustainable development and digital transformation of education are also being actively researched. O. Kovalenko & I. Kutelmah (2025) justified the need to update the system of professional development of teachers in accordance

with UNESCO's international recommendations and emphasises the importance of continuing education. T. Odintsova (2024) argues that the formation of ESG competencies is a key condition for the professional sustainability of educators in the context of global challenges. An analysis of educational practices in crisis conditions, presented by L. Gutierrez-Bucheli *et al.* (2022), confirms that the integration of environmental issues with inclusive approaches increases the adaptability of educational systems.

Despite the significant number of contemporary studies, most of them are conceptual or review in nature. There are still only a limited number of empirical studies that combine environmental education, universal design for learning principles, and interactive educational formats in the training of future teachers. In particular, there is a lack of research that records quantifiable changes in the knowledge, motivation, and professional readiness of different groups of participants in the educational process. Therefore, there is a need for a comprehensive empirical analysis of the integration of environmental education as an innovative pedagogical strategy into the system of training future teachers.

The aim of the study was to empirically determine the impact of integrating environmental education, universal design principles, and interactive educational formats on the formation of sustainable development competencies in future teachers in the context of contemporary socio-educational transformations. The objectives of the study were: to analyse the educational potential of guest lectures in the system of training future teachers; assess changes in the perceptions of students and teachers regarding environmental education and sustainable development; identify opportunities for integrating universal design principles into informal and innovative educational practices.

Literature Review

ESD is seen as a key tool for shaping the values, competencies and behaviours needed to address global social, economic and environmental challenges. In contemporary scientific discourse, environmental education is seen not only as a component of education for sustainable development, but also as an independent pedagogical strategy aimed at shaping environmental awareness and responsible behaviour. Its key objective is to develop environmental literacy, the ability to analyse environmental problems and make informed decisions in the context of complex socio-environmental interactions (UNESCO, 2020). It is precisely this pedagogical strategy that is now seen as a factor in educational innovation, as it combines content, methods and values for the training of future teachers.

At the international level, education for sustainable development is increasingly linked to the idea of transformative learning, which involves changing the ways of thinking of learners, rather than just transferring knowledge. In this context, emphasis is placed on the need to develop critical thinking, the ability to analyse systems and make decisions in conditions of uncertainty (Lotz-Sisitka *et al.*, 2015). This approach differs from traditional learning in that it focuses on reflection, social impact and active participation in projects, which is an essential element of 21st century teaching practice. For example, ESD programmes in the European Union integrate transformative components into teacher training programmes through project-based tasks and collaboration with local communities, which promotes the practical application of knowledge (Hadjiachilleos & Zachariou, 2022). In this context, environmental education is increasingly interpreted as an innovative pedagogical response to the challenges of climate change and environmental instability. Innovative approaches allow for the integration of environmental knowledge, values, and practical actions into the learning process, which is especially important for training future teachers who are able to work in conditions of uncertainty and social transformation (Barth *et al.*, 2007). Thus, innovative environmental education is becoming not only a substantive component of teacher training, but also a

strategic educational practice that shapes readiness for action in the modern world.

Researchers pay particular attention to the link between ESD and Sustainable Development Goal 4.7, which emphasises the need to integrate sustainable development, human rights and global citizenship into educational policies and practices. Monitoring the implementation of this goal shows significant variation in approaches across countries and the need for unified indicators for assessing educational outcomes (Wiek *et al.*, 2011; Linnerud *et al.*, 2021). Comparative studies show that some countries (e.g. the Netherlands, Finland, Sweden) have more systematic approaches to integrating ESD into teacher training, while other countries are only just beginning their reforms. In teacher education, environmental training for future teachers should be considered an integrated component of professional competence, rather than an additional or optional element. Researchers emphasise that it is the systematic inclusion of environmental issues in teacher training programmes that creates the conditions for the formation of innovative pedagogical practices focused on sustainable development (Leicht *et al.*, 2018). These practices not only expand the professional arsenal of future educators, but also shape their ability to be agents of change in their own communities.

The development of digital technologies is significantly transforming education systems, creating new opportunities for implementing the principles of sustainable development. O. Zawacki-Richter *et al.* (2019) and F. Ferri *et al.* (2020) proved that in scientific literature, the digitalisation of education is seen as a factor in increasing the accessibility, inclusiveness and effectiveness of learning, especially in crisis and post-conflict situations. Smart learning environments based on the use of big data, artificial intelligence and blockchain technologies are increasingly being positioned as tools for ensuring transparency, security and personalisation of the educational process. Research N. Ullah *et al.* (2021) shows that the implementation of blockchain solutions in education contributes to increasing trust in educational outcomes and optimising management processes, which is consistent with sustainable development goals. At the same time, researchers emphasise that technological innovation is not an end in itself. Their effectiveness directly depends on pedagogical design and the ability of educational institutions to integrate digital solutions into the broader context of social responsibility and ethical standards (Punie, 2017). Thus, digital technologies should be seen as a means of supporting sustainable educational practices, rather than as an autonomous factor of change.

Inclusive education is an integral part of sustainable development, as it ensures equal access to quality education for all categories of learners. In contemporary research, inclusiveness is interpreted not only as the adaptation of the educational environment to the needs of persons with disabilities, but as a broader approach aimed at taking into account the diversity of educational needs and learning styles (Florian, 2015). The concept of universal design for learning is central to the development of inclusive educational practices. It involves designing the learning process in such a way as to minimise barriers and ensure flexibility in the ways in which material is presented, learners are engaged and learning outcomes are assessed (Rose, 2000). Research shows that the implementation of UDL principles has a positive impact on academic achievement and student motivation in various educational contexts. The application of the principles of inclusive pedagogy and universal design for learning in environmental education expands the opportunities for engaging different groups of learners in understanding sustainable development issues. For teacher training, this means developing the ability to adapt environmental content and teaching methods to different educational contexts, which enhances the innovative potential of environmental education was also considered by M. Priestley *et al.* (2015) and J. Griful-Freixenet *et al.* (2020). In addition, the use of digital technologies significantly expands the

possibilities for implementing inclusive education. The use of adaptive platforms, assistive technologies and multimodal resources allows the creation of educational environments that comply with the principles of equity and social sustainability (Punie, 2017; Ullah *et al.*, 2021).

The concept of lifelong learning is an important element of the theoretical basis for sustainable development in education. It involves the continuous updating of knowledge and skills throughout life in order to adapt to changes in society and the labour market. At the same time, the development of sustainable learning competencies includes self-regulation of learning activities and the ability to work effectively in different professional contexts, as confirmed by research on self-regulated sustainable learning (Taranto & Buchanan, 2020). In addition, conceptual approaches to adult education emphasise the importance of ESG competencies (environmental, social and governance), which are part of sustainable professional development considered by T. Odintsova (2024). Scientific publications emphasise that lifelong learning is closely linked to the development of key competences, in particular digital literacy, social responsibility and environmental awareness. Such competencies are necessary for the formation of the innovative potential of future educators and the effective integration of environmental education into the educational process (Barth *et al.*, 2007).

In the context of higher education, lifelong learning is seen as a strategic direction for the development of universities, which should act as centres of knowledge open to different age and social groups. V. Yahupov *et al.* (2023) argue that this strengthens the role of universities in achieving sustainable development goals and promotes social cohesion. An analysis of international research shows a growing scientific interest in environmental education as a factor in sustainable development and educational innovation. At the same time, most publications focus on conceptual models, policy documents or general recommendations. Empirical studies analysing specific cases of teacher training remain limited (Bui *et al.*, 2024). This necessitates further development of empirical research in the field of teacher training for sustainable development. The combination of environmental education with inclusive and innovative approaches in the context of social and educational crises is particularly under-researched. Contemporary challenges related to wars, migration and the transformation of education systems require an analysis of real educational practices capable of ensuring the sustainability and flexibility of teacher education (Lambrechts *et al.*, 2018; Gutierrez-Bucheli *et al.*, 2022).

The combination of environmental education, inclusiveness and technological innovation provides a comprehensive approach to developing sustainable thinking and behaviour in students, shaping future educators as agents of change. Thus, innovative environmental education acts not only as a substantive component, but also as a strategic pedagogical concept that integrates knowledge, values and practical actions to ensure sustainable development. The application of the principles of innovative environmental education in teacher training creates the potential for the transformation of education systems and the formation of a generation of educators capable of effectively implementing sustainable development concepts in the educational process.

Materials and Methods

The study was conducted using a mixed-methods research design combining qualitative and quantitative approaches. A case study methodology was selected as the main research strategy, as it enables a comprehensive analysis of educational practices within their real institutional and social context. This methodological approach allowed for an in-depth examination of the pedagogical potential of guest lectures as an innovative educational format for integrating the principles of ESD, lifelong learning, and UDL into the system of teacher training.

The empirical basis of the research was an institutional educational case implemented by

the Department of Botany, Ecology and Horticulture at Melitopol State Pedagogical University named after Bohdan Khmelnytsky (Ukraine). Between September and December 2025, a series of ten guest lectures was organised in a hybrid format, combining face-to-face and online participation. The lectures involved international practitioners and researchers from European Union countries and the United Kingdom, as well as domestic experts from Ukraine, specialising in environmental education, sustainable development, inclusive pedagogy, and innovative teaching methodologies. All lectures were officially announced through the university's website and digital communication channels, ensuring openness, transparency, and equal access to participation. The hybrid format made it possible to engage participants regardless of geographical location, which corresponds to the principles of inclusiveness and lifelong learning.

A total of 350 individuals participated in the study. The sample consisted of 220 bachelor's degree students enrolled in pedagogical specialities and 130 educators, including university academic staff, college instructors, and secondary school teachers. The age of student participants ranged from 18 to 23 years (mean age 20.4 years), while the age of educators ranged from 27 to 59 years (mean age 41.7 years). In terms of gender distribution, 68% of respondents were female and 32% male, reflecting the typical demographic structure of pedagogical education programmes in Ukraine. Participants represented several higher and secondary education institutions, which ensured inter-institutional diversity and strengthened the interdisciplinary and intergenerational character of the case study.

Data collection was carried out using a pre-test/post-test survey design. The questionnaire included ten items grouped into four thematic blocks addressing participants' knowledge of environmental education and sustainable development, their attitudes towards lifelong learning, their readiness to implement inclusive and innovative pedagogical practices, and their evaluation of the educational value of the guest lecture series. Responses were measured using a five-point Likert scale. Quantitative data were processed using descriptive statistics and the Wilcoxon signed-rank test for dependent samples to determine the statistical significance of changes between the pre-test and post-test results. In addition, elements of qualitative observation were used to analyse the organisation of educational interaction and participants' reflective engagement during the lectures.

The study was conducted in accordance with fundamental ethical principles of educational research. Participation was voluntary and based on informed consent obtained prior to data collection. Respondents were informed about the purpose of the study, the anonymity and confidentiality of their responses, and their right to withdraw from participation at any stage without any negative consequences. No personal identifying information was collected, and all data were analysed in aggregated form exclusively for research purposes. The research design complied with institutional academic integrity standards and data protection requirements. The study was conducted in accordance with ethical standards American Sociological Association's Code of Ethics (2018).

Guest lectures were held in a hybrid format and combined presentation materials, examples of practical experience from experts, interactive elements such as Mentimeter and Kahoot, and question and answer sessions, which contributed to the active involvement of participants and the development of reflective thinking. The format and content of the lectures were in line with the key principles of universal design for learning, in particular through the use of different ways of presenting information, varying forms of interaction, and creating conditions for reflection and discussion of the knowledge gained.

Lecture topics included environmental education and sustainable development with a focus on contemporary concepts and practical implementation; pedagogical innovations in teaching

natural sciences; the development of sustainable learning competencies among students of pedagogical specialities; inclusive practices in education for sustainable development; the application of digital technologies and smart learning environments in environmental education; the formation of critical thinking and systematic analytical skills in students; education for global citizenship and international approaches to its implementation; the role of universities in responding to social and educational crises while fostering sustainability; practical cases and international experience in implementing ESD programmes; and the integration of environmental and inclusive content into the professional training of future teachers.

The research methodology included the analysis of the educational content of the guest lectures with regard to their thematic structure and alignment with ESD and UDL principles; systematic observation of the organisation, format, and interactive components of educational interaction during the lecture cycle; and the administration of questionnaire surveys to participants before and after the completion of the lecture series in order to identify changes in knowledge, attitudes, and readiness to implement innovative and inclusive pedagogical practices. To assess the impact of the educational case study, a pre-test/post-test questionnaire design was used. The pre-test was conducted immediately before the first lecture in September 2025. The post-test was conducted after the completion of the lecture cycle in December 2025. This made it possible to record the dynamics of changes in the attitudes, level of awareness and self-assessment of participants regarding environmental education, sustainable development and lifelong learning.

Empirical data was collected using an anonymous questionnaire. The questionnaire was structured into four thematic blocks. The first block focused on the level of knowledge about environmental education and sustainable development and included statements assessing respondents' self-evaluation of their knowledge of sustainable development concepts on a five-point scale; their understanding of the principles of ESD on a five-point scale; and their awareness of current international practices in environmental education on a five-point scale. The second block addressed attitudes towards lifelong learning and included statements evaluating whether respondents considered lifelong learning important for their professional development on a five-point scale; and their readiness to independently seek new knowledge and professional experience beyond the formal curriculum on a five-point scale.

The third block examined readiness to integrate innovative and inclusive methods into professional practice and included statements assessing respondents' readiness to apply inclusive teaching methods on a five-point scale; their willingness to use digital technologies in teaching on a five-point scale; and their intention to participate in inter-institutional and international educational events on a five-point scale. The fourth block was aimed at evaluating the perceived value of the guest lectures and case studies and included statements measuring whether respondents considered guest lectures useful for broadening their professional horizons on a five-point scale; and whether the lectures contributed to a deeper understanding of the importance of environmental education and sustainable development on a five-point scale.

The questionnaire's scale questions were based on participants' self-assessment and used a five-point Likert scale, which allowed for a comparative analysis of the results before and after the lecture series. The data obtained was processed using descriptive statistics and comparative analysis to identify significant changes in participants' attitudes and self-assessment. A comparison of the results before and after the lecture cycle made it possible to record the dynamics of increasing the level of knowledge, readiness to apply innovative and inclusive methods, and the value of participating in international educational events. The approach used is research-descriptive in nature and aims to identify

the potential of educational innovations in the training of future teachers, rather than to statistically generalise the results to a wider population.

To assess the statistical significance of changes in participants' perceptions, knowledge and self-assessment before and after the series of guest lectures, the Wilcoxon signed-rank test for paired samples was used. This non-parametric test allows for the comparison of pre-test and post-test survey results, even if the data does not follow a normal distribution. The use of the Wilcoxon test made it possible to identify statistically significant changes in participants' assessments of their level of knowledge about environmental education and sustainable development, their willingness to apply inclusive methods, and their motivation to participate in international educational initiatives. This approach strengthens the analytical component of the study, allowing not only to describe the dynamics of changes, but also to confirm their statistical validity. The uniqueness and innovation of the case study lay in the combination of different educational approaches and tasks: the involvement of international and inter-institutional experts, the use of UDL principles, and the active implementation of the concept of lifelong learning through a series of guest lectures.

The limitations of the study are the local nature of the case and the limited sample of participants, which is compensated by the depth of analysis, practical orientation and relevance of the educational practice under study in the context of the transformation of teacher education. Thus, the case study allows for assessing the effectiveness of guest lectures as a tool for implementing ESD, integrating universal design principles and developing lifelong learning competencies in future teachers. For a more detailed assessment of the effect of the educational case study, the sample was divided into two main groups: students of pedagogical specialities (n = 220) – higher education seekers; teachers and other educators (n = 130) – scientific and pedagogical staff of the university, teachers and representatives of colleges and other educational institutions. The analysis was conducted in three key areas: knowledge of sustainable development and environmental education; attitudes towards lifelong learning; willingness to apply inclusive and innovative practices (UDL, digital tools, interactive methods).

Results and Discussion

Empirical research has shown that a series of guest lectures had a significant impact on the knowledge, attitudes and readiness of participants to apply the principles of sustainable development, innovative pedagogical practices and the principles of universal design for learning.

Changes in participants' knowledge. The average pre-test score for students in the knowledge block was 3.1 out of 5, while the post-test showed 4.0, indicating a significant increase in knowledge of sustainable development concepts, ESD principles and international practices. For teachers, the average pre-test score was 3.4, while the post-test score was 4.2, demonstrating a significant increase in competence, especially in understanding methodological approaches and practical cases. A detailed presentation of the pre-test and post-test results for both groups, including the values of the Wilcoxon signed-rank test for dependent samples, is provided in Table 1.

Table 1. *Pre-test/post-test results for the knowledge block (Wilcoxon signed-rank test)*

No.	Question	Students pre	Students post	Δ	W (students)	Teachers pre	Teachers post	Δ	W (teachers)
1	Knowledge of sustainable development concepts	3.0	3.9	+0.9	180	3.3	4.2	+0.9	75
2	Understanding of ESD principles	3.1	4	+0.9	185	3.4	4.3	+0.9	80

Table 1. *Continued*

No.	Question	Students pre	Students post	Δ	W (students)	Teachers pre	Teachers post	Δ	W (teachers)
3	International practices in environmental education	3.2	4	+0.8	170	3.5	4.2	+0.7	78

Source: *author's development*

Changes in attitudes towards lifelong learning. The results showed that guest lectures encouraged participants to make more active use of opportunities for continuing professional development. The average pre-test score for students was 3.2, post-test – 4.1, while for teachers – 3.5 and 4.2, respectively. Both groups showed positive dynamics in motivation to participate in international educational programmes and open online events. A detailed comparison of pre-test and post-test indicators for this block, including the results of the Wilcoxon signed-rank test for dependent samples, is presented in Table 2.

Table 2. *Pre-test/post-test results for the attitude block (Wilcoxon signed-rank test)*

No.	Question	Students pre	Students post	Δ	W (students)	Teachers pre	Teachers post	Δ	W (teachers)
4	Attitude towards lifelong learning	3.2	4	+0.9	190	3.5	4.2	+0.7	77
5	Motivation to participate in international programmes	3	3.9	+0.9	180	3	4.1	+0.8	75

Source: *author's development*

Readiness to apply inclusive and innovative practices. The block assessing readiness to integrate UDL, digital technologies and innovative methodologies showed significant improvements. Students increased their average score from 3.1 to 4.0, while teachers increased theirs from 3.4 to 4.2. The most significant changes were recorded in questions regarding the use of multimodal materials and interactive platforms (Mentimeter, Kahoot) in the learning process. A detailed presentation of the comparative pre-test and post-test results for this block, including the Wilcoxon signed-rank test statistics for dependent samples, is provided in Table 3.

Table 3. *Pre-test/post-test results for the innovation readiness block (Wilcoxon signed-rank test)*

No.	Question	Students pre	Students post	Δ	W (students)	Teachers pre	Teachers post	Δ	W (teachers)
6	Willingness to apply inclusive methods	3	3	+0.9	185	3	4.2	+0.9	78
7	Integration of environmental and inclusive content	3.1	4	+0.9	180	3.4	4.1	+0.7	75
8	Use of digital technologies	3.2	4	+0.8	175	3.5	4.2	+0.7	77

Source: *author's development*

Assessment of the value of lectures and case studies. The results of the analysis of block 4 showed that guest lectures significantly contributed to increasing participants' awareness of the value of the educational case study and broadening their professional horizons. The average pre-test score for students on the question "Lectures are useful for professional horizons" was 3.0, while the post-test showed 4.3, indicating a noticeable positive trend (+1.3). For teachers, the corresponding figures were 3.2 and 4.4 (+1.2), demonstrating a significant increase in the assessment of the value of lectures for their own professional activities.

Regarding the question "The lectures helped to realise the importance of environmental education", the average score for students increased from 3.1 to 4.4 (+1.3), while for teachers it increased from 3.3 to 4.5 (+1.2). The data obtained confirm that the series of guest lectures not only increases knowledge and motivation to apply innovative methods, but also contributes to a deeper understanding of the importance of environmental education and sustainable development. A detailed comparison of the pre-test and post-test results for this evaluation block, including the Wilcoxon signed-rank test statistics for dependent samples, is presented in Table 4.

Table 4. *Pre-test/post-test results for the lecture and case study evaluation block (Wilcoxon signed-rank test)*

No.	Question	Students pre	Post students	Δ	W (students)	Teachers pre	Teachers post	Δ	W (teachers)
9	Lectures useful for professional horizons	3	4	+1.3	190	3.2	4.4	+1.2	80
10	The lectures helped me realise the importance of environmental education	3.1	4	+1.3	192	3.3	4.5	+1.2	82

Source: *author's development*

The data obtained demonstrate statistically significant positive dynamics in all four blocks for both groups of participants ($p < 0.01$, Wilcoxon signed-rank test), which indicates the effectiveness of guest lectures as a tool for developing competencies in the field of sustainable development, integrating the principles of UDL and stimulating lifelong learning. For a comprehensive visual representation of the comparative pre-test and post-test mean values, together with the corresponding Wilcoxon test results (Fig. 1).

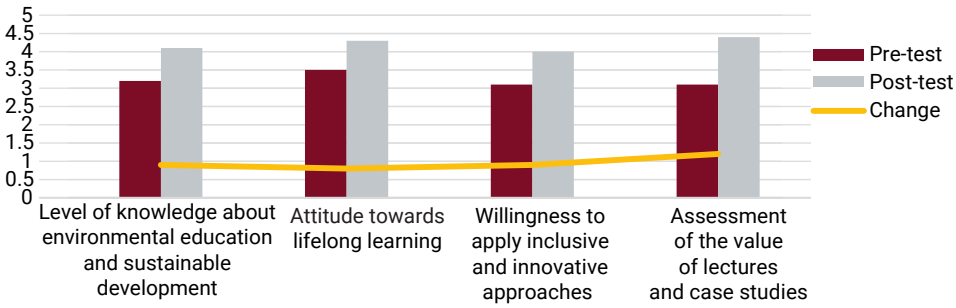

Figure 1. *Mean values for pre-test, post-test, and Wilcoxon test*

Source: *author's development*

A more detailed examination reveals specific characteristics of the responses of different groups: students demonstrated more pronounced dynamics in the blocks of knowledge and motivation for lifelong learning, which can be explained by their openness to new digital platforms and interactive methods (Mentimeter, Kahoot). They actively absorbed examples of international cases and digital resources, which was reflected in an increase in average scores of +0.9 in the knowledge block and +0.9 in the motivation block; teachers showed more noticeable changes in the blocks of readiness to apply innovative practices and UDL integration. This confirms the value of inter-institutional exchange of experience and practical training: teachers had the opportunity to try out tools for activating learning, adapt examples to their own courses, and improve their pedagogical competence in the field of sustainable development. The average increase in the block of readiness to apply innovations was +0.8-0.9 points, which is a high indicator for a group with teaching experience.

Guest lectures were held in a hybrid format, which ensured the active participation of participants from various educational institutions. The use of the interactive platforms Mentimeter and Kahoot contributed to increased engagement and reflective thinking. During the lectures, participants had the opportunity to evaluate practical case studies, discuss their own ideas and ask questions to experts. A survey showed that 82% of students acknowledged that interactive elements significantly increased their motivation and activity, and 78% of teachers noted that the lecture format provided valuable experience for integrating innovative methods into their own teaching.

The results of the present study are consistent with contemporary international research examining the pedagogical impact of guest lectures and inter-institutional collaboration in higher education. In particular, A. Alshahrani (2024), in a systematic review devoted to the use of guest speakers in university teaching, demonstrates that structured interaction with external experts significantly enhances student engagement, strengthens the connection between theoretical knowledge and professional practice, and improves learning outcomes. The author emphasises that exposure to authentic professional contexts contributes to the development of applied competencies and professional readiness. A similar position is articulated by M. Ma (2025), who analyses the strategic integration of guest speakers into academic programmes. M. Ma concludes that guest lectures function as a mechanism of practice-oriented learning, facilitating deeper comprehension of disciplinary content and increasing student motivation. The positive dynamics recorded in the study – particularly the statistically significant growth in knowledge and motivation for lifelong learning – correspond to these findings. The broader institutional dimension of sustainability education has been substantiated by A. Annelin & G.-O. Boström (2024). In their model of sustainability competence support, the authors demonstrate that inter-institutional collaboration and interdisciplinary exchange contribute to transformative learning and foster the development of sustainable thinking patterns. Likewise, X. Qu & B. Cross (2024), investigating inclusive higher education practices, show that collaborative and inclusive learning environments increase student participation and academic engagement. The inter-institutional composition of participants in the present case study aligns with these conclusions, as professional exchange between universities and colleges strengthened reflective dialogue and competence development.

The role of universal design for learning in teacher education has been empirically validated by J. Griful-Freixenet *et al.* (2020), who demonstrate that the systematic implementation of UDL principles enhances preservice teachers' readiness to apply inclusive methodologies. Their findings confirm that UDL not only ensures accessibility but also supports pedagogical flexibility and professional confidence. The observed increase in participants' readiness to apply inclusive and multimodal approaches in the present study corresponds

with these empirical results. The integration of digital technologies within sustainability-oriented education has also been explored in recent research. O. Zawacki-Richter *et al.* (2019) highlight that digital transformation in higher education strengthens personalisation and accessibility when grounded in sound pedagogical design. Complementary evidence provided by N. Ullah *et al.* (2021) indicates that technology-enhanced learning environments contribute to engagement and institutional transparency when aligned with strategic sustainability goals. The hybrid format and use of interactive platforms in the present study reflect these evidence-based approaches.

Inclusive and innovative strategies in contemporary education have additionally been examined by W.-K. Giera (2025), who demonstrates that inclusive learning communities foster communication skills and collaborative competencies. In the Ukrainian context, O. Kovalenko & I. Kutelmah (2025) argue that digital transformation and internationalisation of teacher professional development enhance institutional adaptability and lifelong learning orientation. Furthermore, M. Stevkovska *et al.* (2025) emphasise that active learning formats support critical thinking and long-term competence formation, reinforcing the importance of structured interactive engagement in higher education. Earlier analytical work by S. Gallagher & P. Murphy (2024), devoted to inter-institutional lifelong sustainability education initiatives, underscores that collaborative e-learning models strengthen knowledge exchange and support sustained professional growth. The outcomes of the present case study – particularly the statistically significant improvements across all analytical blocks – confirm these broader theoretical and empirical trends.

Taken together, the international and national evidence demonstrates that the strategic combination of guest lectures, universal design for learning principles, digital technologies, and inter-institutional cooperation creates a multidimensional pedagogical environment conducive to competence-based teacher education. The findings of this study not only correspond with existing research but also extend it by providing quantitative confirmation of measurable changes in knowledge, motivation, and professional readiness within a structured case study framework. Despite the local scope of the research, the results indicate the scalability of similar initiatives in other higher education institutions and confirm that hybrid and inclusive educational formats can significantly enhance accessibility, sustainability, and innovation in teacher training systems.

Conclusions

The aim of this study was to analyse environmental education as an innovative pedagogical strategy for sustainable development based on the case study of training future teachers at a higher education institution using guest lectures, universal design for learning principles and the concept of lifelong learning. The results obtained give grounds to assert that the set goal was fully achieved. Empirical data obtained from preliminary and final questionnaires showed statistically significant positive dynamics in all areas studied: level of knowledge of environmental education and sustainable development, attitude to lifelong learning, readiness to apply inclusive and innovative pedagogical practices, as well as assessment of the value of guest lectures as an educational format. The application of the Wilcoxon test for dependent samples confirmed the significance of the changes identified among both students and teachers, which indicates the effectiveness of the chosen educational approach regardless of the level of professional experience of the participants.

A comparative analysis of the results of the two groups of participants revealed differences in the nature of educational dynamics. Students demonstrated more pronounced growth in knowledge and motivation, which may be due to their openness to digital technologies, interactive formats, and international educational experience. At the same time, teachers showed significant positive changes in their readiness to integrate environmental, inclusive and innovative

content into their own teaching practice, which emphasises the importance of inter-institutional and inter-professional exchange of experience. An important result of the study is the confirmation that a series of guest lectures, implemented in a hybrid format and using the principles of universal design for learning, contributes to broadening the professional horizons of participants, raising awareness of the role of environmental education and forming a sustainable motivation for lifelong learning. The combination of international experience, practical cases and interactive methods has created an inclusive educational environment capable of responding to the current challenges of teacher education.

Thus, the results of the study confirm the feasibility of integrating environmental education, universal design principles, and innovative forms of informal education into the training of future teachers. Despite the local nature of the case study, the conclusions are of practical value and can be used to develop and scale similar educational initiatives in higher pedagogical education institutions. Prospects for further research are related to expanding the sample of participants, applying long-term (longitudinal) research designs, and studying the impact of digital and international educational environments on the formation of sustainable development competencies in the context of the transformation of teacher education.

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Conflict of Interest

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Екологічна освіта як інноваційна педагогічна стратегія сталого розвитку: кейс-дослідження підготовки вчителів

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Анотація. У статті представлено результати емпіричного дослідження потенціалу екологічної освіти як інноваційної педагогічної стратегії сталого розвитку в системі підготовки майбутніх учителів. Метою дослідження був аналіз ефективності серії гостьових лекцій за участю міжнародних країн (Європейського Союзу та Великої Британії) і українських практиків та дослідників як інструменту впровадження принципів освіти для сталого розвитку, навчання впродовж життя та універсального дизайну навчання. Дослідження ґрунтувалося на змішаному якісно-кількісному підході із застосуванням кейс-стаді як основного методологічного дизайну. Емпіричною базою стало освітнє кейс-дослідження, проведене кафедрою ботаніки, екології та садівництва Мелітопольського державного педагогічного університету імені Богдана Хмельницького, у межах якого протягом 2025 року було реалізовано серію з десяти гостьових лекцій у гібридному форматі. У дослідженні взяли участь 350 учасників, зокрема студенти педагогічних спеціальностей, науково-педагогічні працівники та представники інших закладів освіти. Для оцінювання впливу освітнього втручання застосовано дизайн анкетування до і після (pre-test/post-test) на основі п'ятибальної шкали Лайкерта. Результати проаналізовано за допомогою описової статистики та непараметричного критерію знакових рангів Вілкоксона для залежних вибірок. Отримані результати продемонстрували статистично значущу позитивну динаміку обізнаності учасників щодо екологічної освіти та сталого розвитку, їх ставлення до навчання впродовж життя, а також готовності впроваджувати інклюзивні та інноваційні педагогічні практики. Порівняльний аналіз засвідчив, що студенти продемонстрували більш відчутне зростання мотивації та рівня знань, тоді як викладачі показали вищий рівень готовності інтегрувати набутий досвід у професійну діяльність. Практична цінність дослідження полягає у можливості використання його результатів закладами вищої освіти та центрами підготовки вчителів для розроблення й упровадження сталих, інклюзивних та інноваційно орієнтованих програм професійного розвитку

Ключові слова: освіта для сталого розвитку; універсальний дизайн для навчання (UDL); навчання впродовж життя; гостьові лекції; підготовка майбутніх вчителів; педагогічні інновації

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The role of field practicum in the development of professional skills of future social workers

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Abstract. Against a backdrop of growing social challenges, work placements are becoming increasingly important in the training of social work professionals; however, their impact on the development of students' professional skills remains under-researched. The purpose of this article was to investigate the influence of work-based practice on the dynamics of professional skill development among future social workers and to evaluate the role of the type of practice base, students' educational

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level, and prior volunteer or employment experience in this process. The study adopted a quantitative descriptive-comparative design. The sample comprised 187 students from the National University of Life and Environmental Sciences of Ukraine enrolled in the specialty 231 "Social Work" (taking into account the higher education standard for the field of "Social Work and Counselling"). Data were collected via questionnaires administered before the start and after the completion of work-based practice. The study systematised theoretical approaches to understanding work-based practice as a pedagogical phenomenon and reveals a statistically significant increase in students' self-assessed competence across all five clusters of professional skills: communication skills, assessment of client needs and resources, planning and implementation of interventions, reflective practice, and ethical decision-making. The largest effects were recorded for communication skills and reflective practice. Students who undertook practice in rehabilitation centres and centres for persons with disabilities demonstrated higher gains in communication skills, needs assessment, and intervention planning. Practice in organisations supporting internally displaced persons most strongly enhanced the ethical dimension of professional training. Although prior experience was associated with a higher initial level of competence, the gap between students with and without such experience significantly narrowed after the completion of practice. The practical significance of this study lies in the use of its findings to update work placement programmes, select placement settings, develop methodological guidelines, and strengthen the supervisory support provided to future social work professionals

Keywords: practical training; social work; professional competence; supervision; reflective learning; practice bases; professional identity

Introduction

The training of future social work professionals in the context of contemporary global challenges – armed conflicts, mass displacement of populations, growing social vulnerability, and the transformation of the welfare state – is acquiring a new dimension. University education can no longer be confined to the transmission of theoretical knowledge: society expects professionals capable of acting in complex, unpredictable, and frequently crisis-laden situations. It is for this reason that field practicum, as a form of professional learning, is occupying an increasingly prominent place in the system of training future social workers, becoming the educational and professional space in which theory acquires applied meaning and the student gradually transitions from the role of learner to that of future practitioner.

Contemporary approaches to the preparation of social workers demonstrate that practicum is one of the key forms of professional development, as it directly ensures the integration of academic learning, real professional experience, ethical responsibility, and engagement with service users. In the standards of the Council on Social Work Education, field education is defined as an essential component of professional formation that enables students to apply the knowledge, values, and skills of social work in a real or simulated professional environment (Council on Social Work Education, 2022). At the same time, research in the field of field education indicates that a gap may arise between university preparation and the demands of practice, particularly when the educational process is insufficiently oriented towards the formation of the specific professional skills required for client work, case documentation, inter-professional collaboration, and decision-making in complex situations. This raises a fundamental question for higher education institutions: under what conditions does field practicum genuinely ensure the acquisition of competencies needed by the future

social worker. This question is being actively investigated by scholars across different countries. J. Caspersen & J.C. Smeby (2021) demonstrated that the quality of learning during practicum depends significantly on the nature of the specific tasks the student performs, rather than merely on the duration of their placement. These findings are consistent with those of a Scandinavian study in which it was shown that different types of learning activity during practicum directly influence the development of professional competence and professional identity among social work students (Kuusisto *et al*., 2024).

The issue of professional identity formation through practical training warrants separate consideration. Reflective writing, when integrated into the practicum process, has been shown by J. Christensen & A. Wärnsby (2023) to facilitate a deeper awareness among students of their own professional role, values, and the meaning of social work. C. Hitchcock *et al*. (2025) extend this perspective by emphasising that social work education should foster professional resilience – that is, the capacity to withstand demanding practical situations, to maintain ethical orientation, professional motivation, and readiness for responsible intervention. Alongside the discussion of the content of practicum, a parallel debate has emerged concerning its forms. The COVID-19 pandemic exposed the limitations of the traditional face-to-face model of field education and prompted the search for alternative models of practical training. B. Mitchell *et al*. (2021) established the viability of remote and virtual field placement in social work, regarding it not merely as a temporary crisis response but as a potentially flexible learning format. S. Harris & M. Newcomb (2024) demonstrated the possibilities of simulated placement in a blended real and digital environment, which allows professional situations to be modelled, practical skills to be developed, and the learning process to be sustained under conditions of limited access to traditional practice settings. Accordingly, contemporary field practicum increasingly transcends the classical model of the student's physical presence within an institution and encompasses a combination of in-person, remote, simulation-based, and digital formats.

The Ukrainian scholarly community is likewise actively engaged with these issues. Z.M. Komarynska & O.V. Kozak (2025) emphasise practical training as a key factor in the professional development of future specialists in the field of social security. Under conditions of martial law, this issue acquires particular significance, as societal demands on the social support system are growing whilst the personnel, organisational, and resource capacities of social services remain constrained. N. Tverezovska *et al*. (2026) highlight the importance of integrating learning, the research dimension, and practice in the preparation of future social workers, which is essential for the development of evidence-informed social work.

An analysis of the scholarly literature makes it possible to identify several problem areas that remain insufficiently researched. First, the question of how specific types of tasks undertaken during field practicum affect the development of particular groups of professional skills among future social workers requires more differentiated investigation. Second, the role of the supervisor as a pedagogical actor in the process of practical training is explored predominantly in international contexts, whereas Ukrainian conditions demand separate analysis that accounts for martial law, the staffing pressures on social services, and the uneven access of students to high-quality practice settings. Third, the criteria for assessing the outcomes of field practicum remain a matter of debate – in particular, the relationship between formal indicators, such as the number of hours completed and tasks performed, and qualitative indicators related to reflection, professional identity, ethical sensitivity, communicative readiness, and the capacity to act in complex cases. It is precisely these gaps that define the relevance of the present article.

The aim of the study was to determine the influence of field practicum on the dynamics of professional skill development among future

social workers and to evaluate the role of the type of practice setting, educational level, and prior experience in this process. Achieving this aim involved addressing the following objectives: 1) to systematise approaches to understanding field practicum as a pedagogical phenomenon in the training of future social workers; 2) to identify the key factors that determine the effectiveness of field practicum in the context of professional skill development; 3) to outline the current challenges and prospects for the modernisation of field practicum within the Ukrainian educational context. The scholarly novelty of the work lies in the comprehensive comparison of international and domestic approaches to the organisation of field practicum in the training of future social workers, as well as in the identification of the specific character of this process under conditions of martial law and the transformational changes taking place in the social services system of Ukraine.

Literature Review

The question of organising field practicum in the training of future social workers has a long research tradition; however, it is precisely recent years that have been marked by a substantial rethinking of its content, functions, and effectiveness. This shift in scholarly perspective is associated with the increasing complexity of social demands, the growing need for evidence-informed social work, the digitalisation of social services, the spread of remote and blended formats of professional interaction, and the crisis conditions brought about by the COVID-19 pandemic, armed conflicts, and the mass displacement of populations. Under such circumstances, field practicum is increasingly regarded not as a concluding stage for consolidating theoretical knowledge but as the central mechanism of professional development for the future social worker.

In international scholarly discourse, the practical training of social workers is understood as a distinctive form of professional learning that ensures the integration of academic preparation, real-world experience of engagement with clients, supervisory support, ethical reflection on professional actions, and the formation of professional identity. In the standards of the Council on Social Work Education (2022), field education is identified as an essential component of training that enables students to apply the knowledge, values, ethical principles, and skills of social work in a real or simulated professional environment. This approach fundamentally transforms the understanding of field practicum: it emerges not as an appendage to the curriculum but as a space in which the student transitions from the acquisition of knowledge to the performance of professional action. In the work of M. Bogo (2015), field education is conceptualised as one of the foundational components of clinical and professional training for social workers. The researcher emphasised that it is precisely practicum that enables the student to learn how to integrate theoretical knowledge, professional values, ethical principles, supervisory feedback, and concrete action in situations of helping. Accordingly, the effectiveness of practicum cannot be assessed solely on the basis of its completion or the number of hours undertaken. Far more important are the content of the tasks, the degree of the student's integration into the professional environment, the quality of supervisory support, the opportunity to reflect on one's own actions, and the gradual assumption of professional responsibility.

Particular significance for understanding field practicum as a pedagogical phenomenon attaches to studies concerned with the relationship between practical training and learning outcomes. J. Caspersen & J.C. Smeby (2021) argued that the effectiveness of practicum depends not merely on the duration of the student's placement at the practice setting but, above all, on the nature of the learning tasks, the level of professional engagement, and the quality of the educational experience the student gains during placement training. This position is of special importance in the context of the problem under investigation, since the aim of the work is not a general description of practicum but rather the

determination of its influence on the dynamics of professional skill development among future social workers. The research focus therefore lies not only on the fact of completing a placement but, above all, on which professional situations, actions, tasks, and forms of interaction bring about the development of competencies. A closely related position is that of K. Kuusisto *et al*. (2024), who linked learning activities during practicum with the development of professional competence and professional identity among social work students. The authors emphasised that professional development occurs when the student does not merely observe the work of practitioners but participates in real or simulated professional actions, receives feedback, analyses their own experience, and relates it to the values of social work. It is for this reason that the type of practice setting, the nature of the tasks, and the quality of supervision may affect the development of particular groups of skills – including communicative, analytical, organisational, reflective, and ethical – in different ways.

Field practicum may also be understood within the broader context of work-integrated learning. D. Chilvers *et al*. (2021) considered field education in social work as one form of work-integrated learning, within which academic content acquires a practical dimension through the student's involvement in a professional environment. This approach is productive for the analysis of field practicum, as it enables the latter to be regarded not merely as a component of the educational programme but as a mechanism of transition from university study to professional activity. In the same direction, A. Curto-Reverte (2025) underlines the role of work-integrated learning in the European Higher Education Area as a model that ensures the link between learning, professional activity, and the formation of competencies relevant to the contemporary labour market. Thus, the first objective of the article – the systematisation of approaches to understanding field practicum as a pedagogical phenomenon – draws logically on the conception of practicum as an integrative educational and professional environment.

An important factor in the effectiveness of field practicum is the student's own active engagement in the process of professional learning. P. Beesley (2024) argues for the significance of collaborative experiential learning in the practical training of social workers, emphasising that the development of professional skills occurs through joint case analysis, teamwork, discussion of complex situations, and the collective elaboration of solutions. This approach is important for social work, since professional activity in this field almost invariably involves interpersonal communication, team coordination, inter-agency collaboration, and attention to the client's perspective. Accordingly, practicum must create conditions not only for the individual performance of tasks but also for the student's participation in real processes of professional collaboration. Reflection is one of the key conditions for the effectiveness of field practicum, as it ensures the transition from the immediate performance of professional actions to their deliberate analysis. J. Christensen & A. Wärnsby (2023) demonstrated that reflective writing helps students to achieve a deeper understanding of their professional role, value dilemmas, and their own ways of acting in practical situations. Practical experience acquires educational significance when the student does not merely record completed tasks but analyses them in relation to theoretical knowledge, supervisory feedback, and their own professional development. It is for this reason that reflective practice functions not as an optional element but as a necessary component of effective field practicum.

A distinct place in the scholarly literature is occupied by supervision as a mechanism for ensuring the quality of practical training. Significant for the understanding of supervision is the study by K. Duncanson *et al*. (2024), which emphasises the importance of integrating service user perspectives into the supervision of students. This approach helps future social workers to develop a deeper understanding of the

client-centred nature of the profession, to become aware of the consequences of their own actions, and to learn to make decisions that account for the needs, resources, and rights of service users. Within this context, supervision is not reduced to monitoring the student's completion of tasks but emerges as a pedagogical space for the formation of the capacity for ethical reasoning, professional judgement, responsible intervention, and critical analysis of practical situations. The significance of interaction between the university, students, and practice settings is highlighted by M. Liu *et al.* (2021) in their analysis of the development of field education in social work in China. The authors showed that the effectiveness of practicum depends on the coordinated action of all participants in the educational process: students, lecturers, supervisors, and representatives of the organisations in which the placement takes place. This point is directly relevant to the second objective of the article, as it allows the identification among the key factors of practicum effectiveness not only of the content of individual tasks but also of the organisational readiness of the practice setting, the quality of partnership between the university and the institution, the availability of supervisory support, and a professionally rich environment.

At the same time, contemporary research demonstrates that practical training requires a renewal of its formats in response to new technological and social conditions. The COVID-19 pandemic exposed the limitations of the traditional understanding of practicum as the student's exclusively physical presence within an institution. B. Mitchell *et al.* (2021) establish the viability of remote and virtual field placement in social work, considering it not merely as a temporary crisis response but as a potentially flexible learning model. In the same context, S. Harris & M. Newcomb (2024) analyse simulated placement in a blended real and digital environment, which allows professional situations to be modelled, communicative readiness to be developed, and case analysis skills and student confidence to be fostered prior to entry into real-world practice. Accordingly, the modernisation of field practicum involves the expansion of its forms, including through simulation-based, remote, and blended models. The digitalisation of social work brings into focus yet another dimension of professional skills. H. Zhu & S.T. Andersen (2022) emphasise that digital competence is becoming an increasingly integral part of the professional activity of a social worker, as contemporary practice involves the use of electronic documentation, online communication, digital services, remote client support, and inter-agency collaboration. In the analysis of field practicum, it is pertinent to note that the type of host institution influences not only the content of the student's professional tasks but also the level of their engagement with digital tools in social work. For example, placement in community organisations, centres supporting internally displaced persons, or institutions that work with digital databases and online referrals may create different opportunities for the development of digital readiness compared with placement in traditional social services.

Structural contradictions of field practicum are also widely represented in contemporary literature. C. Morley *et al.* (2024), analysing the experiences of students, educators, and practitioners in relation to modified field education standards during the COVID-19 pandemic, show that the system of practical training has considerable adaptive potential whilst simultaneously revealing problems of quality, equitable access, supervisory continuity, and student support. In a closely related problem area, D. Jackson *et al.* (2023) examined work-integrated learning through the lens of equity and inclusion, emphasising that different groups of students may have unequal access to quality practical experience. This is of particular importance for the Ukrainian educational context under martial law, when access to practice settings, safe environments, supervisory support, and resource provision may be uneven. The problem of accessibility and flexibility in practical training is also illuminated through the model of employment-based placements.

M. Lynch *et al*. (2023) argued for such placements as a more flexible and socially equitable model of practicum organisation, capable of broadening students' access to quality professional experience. For the present article, this source is significant in light of the investigation of the role of prior volunteer or employment experience among students. If a student already has some experience in the social field, field practicum may serve not only an introductory but also a deepening function, facilitating the deliberate development of professional skills, professional identity, and readiness for more complex tasks.

Interdisciplinary research confirms that field practicum is a universal pedagogical mechanism for the development of professional skills across different fields of training. W.A. Alkhelaiwi *et al*. (2024), analysing the competence of nursing students during clinical practicum, show that it is precisely the practical environment that makes it possible to assess the future professional's capacity to act in real professional situations. R. Carranza Guevara *et al*. (2025), drawing on the training of accounting students, demonstrated the link between pre-professional internships and the development of skills and perceptions of employability. H. Gutiérrez-Pulido & C. Orozco-Rodríguez (2025), analysing the professional internships of engineering and science students, showed their influence not only on applied skills but also on academic development. Thus, practicum is not merely a specific requirement of social work but a broader educational mechanism that enables the transition from knowledge to competent action.

Additional understanding of the role of practicum in professional development is provided by studies conducted in the field of engineering education. L.Y.Y. Luk & C.K.Y. Chan (2022) propose examining the outcomes of engineering internships through a system of learning outcomes formed as a result of the student's engagement with a real professional environment. The question of professional resilience and identity constitutes another important dimension of the analysis of field practicum. C. Hitchcock *et al*. (2025) showed that social work education should promote the development of professional resilience among students and newly qualified practitioners, since it is precisely this quality that helps to sustain motivation, ethical orientation, and the capacity to act in emotionally demanding professional situations. B. Moorhead *et al*. (2026) extend this perspective by analysing the mechanisms that sustain the professional identity of social workers. In the context of the present article, this provides grounds for regarding field practicum not merely as a means of forming individual applied skills but as an environment of professional self-determination in which the student relates their own expectations, values, personal resources, and readiness to work in the field of social assistance.

The Ukrainian context of practical training has its own specific characteristics, linked to the transformation of the social services system, the consequences of the war, the growing number of vulnerable population groups, and the need to prepare specialists capable of working under conditions of resource scarcity and high emotional burden. Z.M. Komarynska & O.V. Kozak (2025) emphasised that practical training is the leading factor in the professional development of future specialists in the field of social security, as it ensures the connection between theoretical knowledge and real professional situations. A. Solnyshkina (2023), analysing the methods and directions of practical training of social workers using a Ukrainian university as a case study, emphasised the significance of practicum for the formation of applied skills, professional adaptation, and readiness to work in social institutions. S. Tkachuk (2024), investigating the field practicum of future vocational education specialists, likewise regards it as a component of professional training that ensures the link between the educational process and future professional activity.

Of particular significance for the issues raised in this article is the work of N. Tverezovska *et al*. (2026), in which field practicum is examined in connection with the research dimension of preparing future social workers for practice

with older adults. The approach proposed by the authors broadens the understanding of practicum's functions, as it enables the latter to be interpreted not only as a space for the acquisition of applied skills but also as an environment for the development of analytical thinking, a research culture, and the capacity to combine practical activity with professional analysis of social problems. This approach is significant for the problem under investigation, since the professional skills of a future social worker are not limited to communication with clients or the performance of individual procedures but encompass the capacity to assess needs, analyse resources, plan interventions, document outcomes, and critically reflect on the effectiveness of one's own actions.

Thus, the analysis of the scholarly literature provides grounds for regarding field practicum as a complex pedagogical phenomenon that combines the student's professional immersion in a real social work environment, the performance of professionally significant tasks, supervisory support, reflective engagement with experience, the development of professional identity, and the formation of readiness for responsible intervention. At the same time, the existing research demonstrates that the effectiveness of practicum depends not merely on the fact of its completion but also on the type of practice setting, the nature of the tasks, the quality of supervision, the student's educational level, their degree of prior preparation, and any volunteer or professional experience they may have. It is precisely for this reason that the subsequent empirical analysis in this article is directed towards identifying the dynamics of professional skill development among future social workers before and after completing their field practicum, as well as towards evaluating how the type of practice setting, educational level, and prior experience influence this dynamic.

Materials and Methods

The study was carried out within a quantitative descriptive-comparative design using questionnaire-based surveying as the primary method of empirical data collection. The choice of this approach is justified for the study of the dynamics of professional skill self-assessment in a large sample, as it provides standardised measurement before and after field practicum and enables comparison of results across students depending on their type of practice setting, educational level, and the presence or absence of prior volunteer or employment experience. This logic of empirical measurement is employed in studies of the practical training of students across various specialties, where attention is focused on the assessment of competence, learning experience, and the outcomes of professional development in a real or simulated professional environment (Alkhelaiwi *et al.*, 2024).

The study was conducted at the National University of Life and Environmental Sciences of Ukraine amongst students in the specialty 231 "Social Work" who undertook field practicum during the 2023-2025 academic years. Data collection was carried out in two stages: at the start of the field practicum (pre-measurement) and immediately upon its completion (post-measurement). This design made it possible to track the dynamics of students' self-assessed professional skill development and to compare changes across individual competency clusters. A total of 187 students enrolled in the specialty 231 "Social Work" at the National University of Life and Environmental Sciences of Ukraine who undertook field practicum within the timeframe stipulated by the curriculum were included in the study. Among the participants, 124 were undergraduate students in Years 3-4 and 63 were postgraduate students in Year 2. The gender distribution of the sample was 78% female and 22% male. The mean age of participants was 21.8 years, with an age range of 19 to 32 years.

Sample formation was carried out by means of total sampling: all students enrolled in the specialty 231 "Social Work" who were undertaking field practicum during the designated period and who met the inclusion criteria were invited to participate. The inclusion criteria were: status

as a full-time or part-time student enrolled in the specialty 231 "Social Work" at the National University of Life and Environmental Sciences of Ukraine; active completion of field practicum of no less than 90 hours in duration; and voluntary informed consent to participate in the study. The exclusion criteria were the absence of confirmed informed consent and failure to return a completed questionnaire at both measurement stages. Following the application of the exclusion criteria, 16 students were excluded from the initial sample of 203 individuals. The final sample comprised 187 participants, with a retention rate of 92.1%. Students completed their field practicum at institutions and organisations of four types, located primarily in Kyiv and the Kyiv region. The first group comprised social service centres, territorial centres for social welfare provision, and social service delivery centres. At these institutions, students were involved in work with older adults, families in difficult life circumstances, and persons with functional limitations. This group included 68 students, representing 36.4% of the sample.

The second group comprised rehabilitation centres and centres for persons with disabilities, including day centres for social and psychological rehabilitation, early intervention centres, and institutions providing services to persons with intellectual disabilities and autism spectrum conditions. Field practicum was undertaken at such institutions by 42 students, representing 22.5% of the sample. The third group comprised organisations supporting internally displaced persons (IDPs), including civil society organisations and local government structures involved in providing humanitarian, psychosocial, and legal assistance to IDPs under martial law conditions. This group included 51 students, representing 27.3% of the sample. The fourth group comprised general educational and special educational institutions, including comprehensive secondary schools and educational rehabilitation centres, where students worked alongside social educators, educational psychologists, and specialists in inclusive education. This group included 26 students, representing 13.9% of the sample. The allocation of students to practice settings was carried out in accordance with the contracts in force between the National University of Life and Environmental Sciences of Ukraine and the host institutions, as well as in consideration of student preferences and available placements.

The primary data collection instrument was an original self-assessment questionnaire for professional skill development, designed in accordance with the competency-based model of social work specialist training set out in the Higher Education Standard of Ukraine for the specialty 231 "Social Work" and updated in line with the current List of Fields of Study and Specialisms, under which training is provided in the specialty I10 "Social Work and Counselling" (Ministry of Education and Science of Ukraine, 2019; Resolution of the Cabinet of Ministers of Ukraine No. 1021, 2024). The international logic of professional competency formation and assessment in social work was incorporated with reference to the educational policies and accreditation standards of the Council on Social Work Education (2022). The questionnaire consisted of two parts. The first, biographical, part contained questions regarding the mode of study, year of enrolment, type of practice setting, and prior experience of volunteer or paid employment activity in the social field. The second, diagnostic, part comprised 32 statements grouped into five competency clusters.

The first cluster addressed communication skills and contained 7 statements concerning the establishment of contact with clients, active listening, and the maintenance of documentation. The second cluster encompassed the assessment of client needs and resources and contained 7 statements concerning the collection and analysis of information and the prioritisation of interventions. The third cluster was focused on the planning and implementation of social interventions and contained 7 statements concerning the development of an individual plan, coordination

with other specialists, and the application of social work methods. The fourth cluster encompassed reflective practice and contained 6 statements concerning the analysis of one's own actions, awareness of professional boundaries, and the capacity to engage with feedback. The fifth cluster addressed ethical decision-making and contained 5 statements concerning adherence to principles of confidentiality, responses to value dilemmas, and the safeguarding of client rights. Each statement was assessed on a five-point Likert scale, where 1 denoted "not developed at all" and 5 denoted "fully developed". The questionnaire was completed twice: at the start of the practicum and upon its completion.

Preliminary piloting of the instrument was conducted with a pilot sample of 18 students who were not included in the main study. As a result of the piloting, the wording of four statements was refined. Internal consistency of the scale was verified by Cronbach's alpha coefficient, which was 0.83 for the overall scale and ranged from 0.71 to 0.86 for individual clusters, indicating a sufficient level of instrument reliability. The interpretation of internal consistency indicators was carried out in accordance with the methodological recommendations of M. Tavakol & R. Dennick (2011). The survey was administered in an online format via the Google Forms platform, with a secure link accessible only to registered participants. Students received the link to the questionnaire through the official academic communication channels of the Department of Social Work at the National University of Life and Environmental Sciences of Ukraine. The average time to complete the questionnaire was 12-15 minutes.

Statistical data analysis was performed in SPSS Statistics, Version 27.0. Descriptive statistics – including means, standard deviations, and frequency analysis – were used to characterise the sample. A paired samples t-test was used to compare pre- and post-test results. One-way analysis of variance (ANOVA) with Tukey's post-hoc test was used to analyse differences between student subgroups depending on the type of practice setting and educational level. The level of statistical significance was set at $p < 0.05$. Cohen's d coefficient was calculated to assess the practical significance of the identified differences.

The study was conducted in accordance with the ethical principles enshrined in the Declaration of Helsinki of the World Medical Association (World Medical Association, 2013) and the Global Social Work Statement of Ethical Principles of the International Federation of Social Workers (International Federation of Social Workers, 2018). The study protocol was approved by the leadership of the Department of Social Work and Rehabilitation and endorsed in accordance with the internal academic integrity procedures of the National University of Life and Environmental Sciences of Ukraine. Participation in the study was entirely voluntary. Prior to commencing the survey, each student received a written explanation of the aims of the study, the procedures for data collection and storage, and information about the right to decline participation or to withdraw consent at any time without any consequences for their academic performance or practicum grade. Informed consent was confirmed by an active tick in the relevant field of the electronic questionnaire.

No personal identifying data – including name or surname – were collected. Students were assigned conditional numerical codes at the stage of primary data processing. The correspondence between codes from the first and second measurement waves was ensured through a unique identifier independently selected by the participant. This approach precluded de-anonymisation of data by the researchers. The collected data are stored in a secure, access-restricted environment and will be destroyed upon completion of the research project. Members of the research team were not members of the committees responsible for the assessment of the practicum of study participants. Students were separately informed that the results of the survey do not constitute a component of their assessment and are not communicated to practicum supervisors. None of the

questionnaire items concerned personal experiences, client situations, or confidential information about host institutions. Risks to participants were assessed as minimal.

Results and Discussion

The empirical analysis was directed towards determining how field practicum influences the dynamics of professional skill development among future social workers, as well as how this process varies depending on the type of practice setting, the educational level of the students, and the presence of prior volunteer or employment experience in the social field. In accordance with the research objectives, a systematisation of approaches to understanding field practicum as a pedagogical phenomenon is presented first, followed by an analysis of the pre- and post-measurement results across the five competency clusters, and then an identification of the current challenges and prospects for the modernisation of field practicum within the Ukrainian educational context. This logic enables the combination of theoretical synthesis with empirical findings, and demonstrates that field practicum is not merely a formal component of the educational programme but a complex mechanism of professional development for the future social worker.

Systematisation of approaches to understanding field practicum

The first result of the study was a systematisation of approaches to understanding field practicum in the training of future social workers. The analysis of scholarly sources made it possible to identify several interrelated approaches, each of which foregrounds a distinct dimension of practical training: the competency-based, experiential-activity, reflective, supervisory-partnership, digital-innovative, socially just, and interdisciplinary approaches.

Table 1. *Systematisation of approaches to understanding field practicum in the training of future social workers*

Approach	Content of the approach	Educational emphasis
Competency-based	Field practicum is regarded as a space for applying knowledge, values, and professional skills in a real or simulated environment	Formation of professional competencies and learning outcomes
Experiential-activity	Practicum is understood as learning through the student's involvement in real professional actions, task performance, and interaction with clients and specialists	Transition from theoretical knowledge to professional action
Reflective	Practicum acquires educational significance through the processing of experience, the keeping of reflective journals, reflective reports, and supervisory discussion	Development of professional identity, self-reflection, and the capacity to analyse one's own actions
Supervisory-partnership	The quality of practicum depends on the interaction between the student, the university, the practice setting, the supervisor, and service users	Professional support, feedback, client-centredness
Digital-innovative	Practical training can be delivered through remote, simulation-based, blended, and digital formats	Readiness for new formats of social work, digital communication, and online documentation
Socially just	Practicum is analysed from the perspectives of accessibility, equal opportunity, and financial and resource barriers	Overcoming inequalities in access to quality practical experience

Table 1. *Continued*

Approach	Content of the approach	Educational emphasis
Interdisciplinary	Practical training is regarded as a universal mechanism for the development of professional skills across different fields	Comparison of social work experience with medical, engineering, economic, and other specialties

Source: *developed by the authors on the basis of M. Bogo (2015), Ministry of Education and Science of Ukraine (2019), B. Mitchell et al. (2021), Council on Social Work Education (2022), R. Lateef et al. (2023), W.A. Alkhelaiwi et al. (2024), C. Morley et al. (2024), B. Moorhead et al. (2026)*

The systematisation presented demonstrates that field practicum cannot be reduced merely to the student's completion of a prescribed number of hours at a host institution. It emerges as a complex pedagogical phenomenon that integrates the competency-based, experiential, reflective, supervisory, digital, socially just, and interdisciplinary logic of professional training. It is precisely this multidimensionality that explains the necessity of analysing the effectiveness of practicum not only in terms of the overall indicator of skill gains but also according to individual competency clusters, types of practice setting, educational levels, and students' prior experience.

Dynamics of students' professional skill self-assessment

Analysis of the paired measurements revealed a statistically significant increase in students' professional skill self-assessment following field practicum across all five competency clusters. The recorded dynamic confirms the pronounced developmental effect of field practicum and its significance for the formation not only of individual applied skills but also of the broader complex of professional characteristics of the future social worker (Table 2). The largest gain was recorded in the cluster "Communication Skills" ($\Delta = 1.06$; $d = 1.82$), indicating that direct interaction with clients during practicum is the most influential factor in the development of this group of competencies. In the post-test, students rated their capacity to establish professional contact significantly higher, as well as their ability to sustain dialogue in consideration of the cultural and age-related characteristics of the client, and to document the outcomes of communication. This dynamic is consistent with the conclusions of P. Beesley (2024), who argues for the significance of collaborative experiential learning as a means of forming professional interaction through the involvement of students in joint case analysis, collegial discussion, and practical communication. Field practicum thus proves to be not merely an environment for testing knowledge already acquired but a space of primary professional socialisation in which communicative competence develops as an integrative capacity to combine empathy, professional distance, active listening, explanation, and documentation.

Table 2. *Dynamics of students' professional skill self-assessment before and after field practicum (n = 187)*

Competency cluster	Pre-test M (SD)	Post-test M (SD)	t	p	Cohen's d
Communication skills	3.12 (0.64)	4.18 (0.51)	18.42	<0.001	1.82
Assessment of client needs and resources	2.87 (0.71)	3.91 (0.58)	16.33	<0.001	1.60
Planning and implementation of interventions	2.64 (0.78)	3.67 (0.63)	14.89	<0.001	1.45

Table 2. *Continued*

Competency cluster	Pre-test M (SD)	Post-test M (SD)	t	p	Cohen's d
Reflective practice	3.38 (0.62)	4.31 (0.48)	17.21	<0.001	1.69
Ethical decision-making	3.56 (0.59)	4.27 (0.52)	13.94	<0.001	1.28

Note: *M – mean value; SD – standard deviation; t – paired samples t-test value; p – level of statistical significance; Cohen's d – effect size*

Source: *developed by the authors on the basis of field practicum data*

A high gain was also observed in the cluster "Reflective Practice" (Δ = 0.93; d = 1.69). This result may be explained by the fact that field practicum was accompanied by the keeping of practicum journals, interim discussion of difficulties, and the writing of final reflective reports. The use of such instruments facilitated the transition from a simple description of completed tasks to an analysis of one's own actions, difficulties, professional boundaries, and value orientations. The results obtained are consistent with the conclusions of J. Christensen & A. Wärnsby (2023), who demonstrated that reflective writing enhances students' capacity to reflect on their own professional role and professional values. A similar logic is confirmed by K. Kuusisto *et al.* (2024), who link learning activities during practicum with the development of professional competence and professional identity among social work students. Accordingly, field practicum is most effective when it is not reduced to the performance of individual assignments but is combined with purposeful reflection, supervisory feedback, and the gradual formation of a professional sense of self within the helping system.

Significant gains were also observed in the clusters "Assessment of Client Needs and Resources" (Δ = 1.04; d = 1.60) and "Planning and Implementation of Interventions" (Δ = 1.03; d = 1.45). These competencies have a complex structure, combining interpersonal interaction with analytical reasoning, contextual assessment, prioritisation of assistance, the use of theoretical models, inter-professional coordination, and the selection of appropriate intervention strategies. This finding is consistent with J. Caspersen & J.C. Smeby (2021), who emphasise that the effectiveness of practicum depends significantly on the content of the tasks the student performs during placement training. In the same context, M. Bogo (2015) highlights the importance of combining professional action, supervision, ethical analysis, and real experience of working with clients. The results obtained provide grounds for concluding that field practicum is most effective at developing complex competencies when the student does not merely perform individual actions but is progressively drawn into the logic of professional case analysis, needs identification, planning of assistance, and evaluation of its outcomes.

The smallest – though nonetheless statistically significant – gain was recorded in the cluster "Ethical Decision-Making" (Δ = 0.71; d = 1.28). This may in part be explained by the relatively high baseline score for this parameter (M = 3.56), given that the ethics of social work formed part of the prior theoretical curriculum. At the same time, even a gain of this magnitude is of considerable significance, since ethical dilemmas in social work acquire real substance precisely in a practical context, where the need arises to reconcile the client's interests, resource constraints, institutional requirements, and professional standards. In this connection, the results may be interpreted through the lens of the Global Social Work Statement of Ethical Principles, which emphasises the primacy of human dignity, social justice, professional responsibility, and respect for human rights as the key orientations of professional activity (International Federation of Social Workers, 2018). Accordingly, field practicum functions as a space

for the contextualisation of ethical principles, in which the student transitions from abstract knowledge of norms to their application under conditions of real moral complexity.

Influence of the type of practice setting on the development of professional skills

One-way analysis of variance revealed statistically significant differences between types of practice setting in the development of individual competency clusters. The identified differences demonstrate that the educational effect of field practicum depends not merely on the fact of its completion but on the character of the professional environment into which the student is immersed (Table 3). Students who undertook practicum at rehabilitation centres and centres for persons with disabilities demonstrated the highest scores on the clusters "Communication Skills", "Assessment of Needs", and "Planning of Interventions". This tendency may be explained by the high level of complexity of the professional environment: work with persons with intellectual disabilities, autism spectrum conditions, and other functional limitations requires adaptive communication, attentiveness to non-verbal cues, the individualisation of support plans, and the coordination of actions with specialists from diverse professional backgrounds. In this context, the results are consistent with the conclusions of K. Duncanson *et al.* (2024), who emphasise the significance of incorporating service user perspectives into the supervision of students, and with the study of M. Liu *et al.* (2021), which highlights the role of coordinated interaction between students, lecturers, and practice settings in enhancing the quality of field education. It may therefore be concluded that it is precisely the level of structural and substantive complexity of the practical environment that largely determines the intensity of students' professional development.

Table 3. *Development of professional skills by type of practice setting (post-test, M ± SD)*

Competency cluster	Social service centres (n = 68)	Rehabilitation centres (n = 42)	IDP support organisations (n = 51)	Educational institutions (n = 26)	F	p	η^2
Communication skills	4.11 ± 0.52^{a}	4.34 ± 0.48^{b}	4.23 ± 0.49^{ab}	4.01 ± 0.54^{a}	3.12	0.027	0.05
Assessment of needs	3.87 ± 0.61^{a}	4.12 ± 0.51^{b}	3.94 ± 0.57^{ab}	3.72 ± 0.62^{a}	3.47	0.017	0.05
Planning of interventions	3.59 ± 0.67^{a}	3.91 ± 0.58^{b}	3.72 ± 0.61^{ab}	3.42 ± 0.66^{a}	4.21	0.006	0.06
Reflective practice	4.28 ± 0.51	4.39 ± 0.42	4.35 ± 0.48	4.19 ± 0.52	1.23	0.299	0.02
Ethical decision-making	4.21 ± 0.54^{a}	4.37 ± 0.48^{a}	4.41 ± 0.49^{a}	4.08 ± 0.58^{a}	2.91	0.036	0.05

Note: *M – mean value; SD – standard deviation; F – F-test value; p – level of statistical significance; η^2 – effect size; different letter superscripts within a row indicate statistically significant differences between groups according to Tukey's test ($p < 0.05$)*

Source: *developed by the authors on the basis of empirical data*

Organisations supporting internally displaced persons produced the highest scores for ethical decision-making (M = 4.41), although the differences between individual groups according to Tukey's test were not statistically significant. This result is logical given the specific character of this environment, in which students encounter resource deficits, high-intensity needs, the traumatic experiences of clients, and the necessity of responding rapidly to situations of moral tension. Z.M. Komarynska & O.V. Kozak (2025) emphasise that the practical training of future social security specialists acquires special weight when it is linked to real social problems, the needs of vulnerable groups, and the necessity of acting under conditions of limited resources. The results of this sub-cluster therefore provide grounds for suggesting that a crisis social environment

intensifies the moral-practical dimension of the training of the future social worker.

Students who undertook practicum at educational institutions demonstrated somewhat lower scores on the majority of clusters, although these differences proved statistically significant only with respect to communication skills and the planning of interventions. This is likely connected to the fact that, in an educational environment, the role of the social worker frequently overlaps with the functions of the social educator, psychologist, and administrative staff, with the consequence that the student does not always gain access to the full range of specifically social-work tasks. This interpretation corresponds with the conclusions of R. Lateef *et al.* (2023), who emphasise that the effectiveness of a placement depends directly on the extent to which the institution is able to provide the student with a clearly structured professional role and to involve them in a genuine field of practice. In this sense, lower scores may be attributable not to the weaker educational potential of the setting itself but to the lesser degree of clarity of the functional space within which the student constructs professional action.

Educational level, dynamics of professional skill development, and the influence of students' prior experience

Comparison of results between undergraduate and postgraduate students revealed expected differences in baseline skill levels and less pronounced differences in the dynamics of their development. This analysis made it possible to evaluate the developmental potential of field practicum for students with differing levels of prior preparation (Table 4).

Table 4. *Development of professional skills among undergraduate and postgraduate students (M ± SD)*

Competency cluster	Undergraduate (n = 124)		Postgraduate (n = 63)		t	p
	Pre-test	Post-test	Pre-test	Post-test		
Communication skills	2.98 ± 0.67	4.09 ± 0.53	3.39 ± 0.51	4.36 ± 0.44	3.42	0.001
Assessment of needs	2.74 ± 0.73	3.84 ± 0.61	3.12 ± 0.63	4.07 ± 0.51	2.57	0.011
Planning of interventions	2.51 ± 0.81	3.58 ± 0.66	2.89 ± 0.69	3.84 ± 0.56	2.73	0.007
Reflective practice	3.29 ± 0.65	4.24 ± 0.51	3.57 ± 0.54	4.45 ± 0.41	2.91	0.004
Ethical decision-making	3.48 ± 0.62	4.19 ± 0.54	3.73 ± 0.51	4.44 ± 0.46	3.18	0.002

Note: *M – mean value; SD – standard deviation; t – independent samples t-test value for the post-test; p – level of statistical significance*

Source: *developed by the authors on the basis of empirical data*

Postgraduate students had statistically significantly higher scores both at the beginning and upon completion of practicum, which is expected given their prior educational preparation, greater academic experience, and more developed professional motivation. More revealing, however, is the finding that the gain in both groups was almost equal: the mean gain for undergraduates was Δ = 1.09, and for postgraduates Δ = 1.01. These results provide grounds for concluding that field practicum retains its developmental potential regardless of the student's initial level of preparation. In the broader professional-educational context, this result corresponds to the logic of competency-based training, according to which practicum should ensure the attainment of professional learning outcomes through the involvement of students in a real or simulated professional environment (Council on Social Work Education, 2022).

The data obtained also indicate that postgraduate field practicum may serve a more complex educational function than practicum at the undergraduate level. Whereas for undergraduates

it more frequently performs the function of initial professional immersion, for postgraduate students it becomes a space for in-depth case analysis, engagement with complex social problems, and the integration of research and practical reasoning. In this context, the work of N. Tverezovska *et al.* (2026) acquires particular significance, in which it is argued that the integration of learning and practice promotes not only the formation of applied skills but also the development of a research culture, analytical reasoning, and readiness to work with complex social problems. Accordingly, field practicum at different educational levels fulfils a common developmental function, yet its substantive content and professional depth may differ substantially.

Additional analysis was conducted with the aim of clarifying the influence of students' prior volunteer or employment experience in the social field on the dynamics of skill development during field practicum. Among the study participants, 41 students (21.9%) reported having such experience of at least six months' duration. Students with prior experience had statistically significantly higher pre-test scores across all clusters; however, after completing practicum, the difference between the groups notably decreased. The results point to the equalising potential of field practicum, since after its completion the differences between students with and without prior experience were considerably reduced. This finding is consistent with the conclusions of M. Lynch *et al.* (2023), who argue for employment-based placements as a flexible model of practical training capable of combining the student's prior experience with formalised educational outcomes. At the same time, the results of this study demonstrate that volunteer or employment experience alone does not substitute for pedagogically organised practicum, since it is precisely structured field practicum that converts individual fragments of prior activity into an ordered system of professional learning.

The significance of prior experience may also be interpreted through the category of professional identity. B. Moorhead *et al.* (2026) emphasise that the sustainability of the professional identity of social workers is formed through the combination of experience, reflection, the support of a professional environment, and an awareness of the significance of one's own role. In this sense, field practicum may fulfil a dual function: for students without prior experience it becomes the initial mechanism of entry into the profession, whilst for students with experience it becomes a means of reflecting upon, structuring, and professionally deepening the practical knowledge already acquired.

Current challenges in the organisation of field practicum

The results of the study and their comparison with scholarly sources make it possible to identify a number of current challenges in the organisation of field practicum for future social workers. Their specification is important, since it is precisely these challenges that account for the uneven development of particular groups of professional skills and the differences between students who undertook practicum at different types of practice setting. One of the most prominent challenges is the uneven educational potential of practice settings. The results demonstrated that rehabilitation centres, IDP support organisations, social service centres, and educational institutions create different opportunities for the development of communicative, analytical, organisational, and ethical competencies. This means that an equal duration of practicum does not guarantee an equal educational effect. The content of tasks, the student's integration into professional processes, access to client work, and the clarity of the professional role are of crucial importance. No less significant a challenge is the quality of supervisory support. The highest gains were recorded where students had the opportunity not merely to perform tasks but also to discuss them, receive feedback, reflect on errors, and analyse professional situations. This position is evident in the works of M. Liu *et al.* (2021) and K. Duncanson *et al.* (2024), which highlight the significance of

supervision, partnership between the university and the practice setting, and the integration of service user perspectives.

Particular attention is required by the insufficient structuring of complex professional tasks. Communication skills grew most intensively, whilst the assessment of needs, planning of interventions, and ethical decision-making required more complex pedagogical guidance. This indicates the need to design practicum tasks more deliberately according to levels of complexity: from observation and communication through to independent case analysis, participation in the planning of assistance, and the evaluation of intervention outcomes. In this context it is important to consider the conclusions of S.J. Ferns *et al*. (2025), who emphasise that work-integrated learning must be a specifically designed component of the educational programme rather than merely an organisational episode of the student's placement at an institution.

The digitalisation of social work constitutes a significant challenge. Contemporary practice increasingly involves the use of electronic documentation, online communication, remote counselling, digital databases, and inter-agency collaboration. H. Zhu & S.T. Andersen (2022) show that digital competence is becoming an important component of the professional activity of a social worker. A similar tendency concerning the significance of digital readiness and soft skills in the professional development of graduates is observed by S. Musa *et al*. (2025) in their analysis of the impact of internships on employability, soft skills, and digital competence. Accordingly, field practicum must ensure not only traditional immersion in an institution but also the acquisition of digital instruments of professional activity.

An important problem area remains the social inequality of access to quality practical experience. Different students have unequal starting resources, prior experience, opportunities to combine study, work, and practicum, as well as differing access to high-quality practice settings. D. Jackson (2015) emphasises that work-integrated learning promotes the development of employability skills, but its effectiveness depends on overcoming organisational barriers, the quality of tasks, and students' readiness to engage reflectively with professional experience. D. Jackson *et al*. (2023) emphasise that practical training can not only broaden professional opportunities but also reproduce social barriers, if the conditions of accessibility, support, and resource provision for students are not taken into account. In the same context, C. Morley *et al*. (2024) regard placement poverty as a significant problem in field education, since unpaid or resource-intensive practicum may exacerbate the financial vulnerability of students and limit their capacity to participate fully in the professional environment.

It should additionally be noted that field practicum is not an equally accessible or equivalent experience for all groups of students. D. Jackson *et al*. (2023) show that participation in work-integrated learning may produce different outcomes for students depending on their starting resources, social circumstances, access to support, and opportunities to engage fully with the practical environment. In the broader international perspective, G. Di Pietro (2022) also emphasises that internships contribute to the development of not only professional but also communicative, adaptive, and intercultural skills, though the effectiveness of such experience depends on the conditions of its organisation. For the Ukrainian context, this means that students may differ in terms of prior experience, place of residence, resource capacity, level of professional confidence, and access to high-quality practice settings. A further challenge is the emotional burden of practicum. Working with individuals in difficult life circumstances, with traumatic experience, disability, loss, or in need of crisis support may be not only professionally developmental for students but also psychologically demanding. Data from P.-L. Wu (2024) concerning the influence of clinical practicum stress on the professional competence of nursing students provide grounds for a broader interpretation of the results of the present study,

since a practical environment may simultaneously be both a resource for skill development and a source of emotional stress, requiring supervisory support, preparation for crisis interaction, and reflective guidance.

Prospects for the modernisation of field practicum

In light of the results obtained, the modernisation of field practicum should be linked above all to the transition from the formal allocation of students to practice settings towards the substantive design of practical experience in accordance with the expected professional competencies. Practice settings should be evaluated not merely on the basis of the availability of contracts or the capacity to receive students but also in terms of which specific groups of skills they are most effectively able to develop: communicative, analytical, reflective, ethical, organisational, or digital. The results of the study demonstrated that different types of institution create unequal opportunities for students' professional development; therefore, practicum programmes must incorporate more clearly defined tasks related to the assessment of client needs, the planning of interventions, inter-professional collaboration, the maintenance of documentation, and the evaluation of helping outcomes. This logic is consistent with the conclusions of S.J. Ferns *et al.* (2025), who emphasise the need for the specific design of a work-integrated learning curriculum, as well as with the findings of G. Di Meglio *et al.* (2022), in which internships are regarded as a factor in graduates' entry into the professional environment and subsequent employment.

An important direction for modernisation is the individualisation of practical training, taking account of the student's educational level, prior volunteer or employment experience, professional motivation, and readiness for the independent performance of complex tasks. For undergraduate students, field practicum should ensure a gradual entry into the profession, the development of basic communicative skills, familiarisation with the logic of a social institution's operation, and the formation of an initial professional identity. For postgraduate students, it is appropriate to strengthen the analytical, research, and coordinative components of practicum – in particular, case work, the evaluation of intervention effectiveness, inter-agency collaboration, and participation in the development of individual support plans. The systematic review by G. Di Pietro (2022), dedicated to international internships and skill development, additionally confirms that practical training can form not only professional but also intercultural, communicative, and adaptive qualities, provided it is organised as a coherent educational trajectory rather than an isolated episode of institutional placement.

The supervisory component of field practicum requires particular strengthening. Supervision should fulfil not only a monitoring function but, above all, an educational, reflective, and supportive one. It is advisable to introduce regular supervisory meetings involving the university-based practicum supervisor, a representative of the practice setting, and students, at which complex cases, ethical dilemmas, difficulties in communicating with clients, the boundaries of professional responsibility, and methods of documenting work outcomes could be analysed. Such a model would transform practicum from a collection of completed assignments into a sequential process of professional learning in which the student gains not only the experience of action but also the opportunity for its reflection. Ukrainian research also confirms the importance of this approach: L. Honchar & S. Holovko (2024) regard work-based practical training as a factor in the formation of the professional competence of future economists, whilst S. Tkachuk (2024) emphasises the role of field practicum as a component of the professional training of future vocational education specialists, demonstrating its universality as a mechanism of professional development regardless of the field of study.

The results obtained indicate the need for broader use of simulation-based, blended, and

digital formats as a preparatory or supplementary component of field practicum. This does not imply a substitution of real interaction with clients but rather the creation of a safe learning space in which students can practise communicative situations, crisis responses, ethical choices, the maintenance of professional documentation, and case analysis in advance. In view of the digitalisation of social work, it is appropriate to supplement the content of practicum with tasks involving electronic documentation, remote communication, work with digital databases, online client referrals, digital maps of social services, and inter-agency collaboration in a digital environment. Such an approach brings practical training closer to the real changes taking place in the field of social work and enhances students' readiness for professional activity within a hybrid, crisis-ridden, or geographically dispersed social support system.

The modernisation of field practicum must also address questions of accessibility and social justice. For students who combine study with paid employment, have family responsibilities, live at a distance from high-quality practice settings, or have limited resources, it is appropriate to provide flexible organisational arrangements: partially remote supervision, individualised timetabling, the possibility of practicum at one's place of employment provided its content meets educational outcomes, and additional supervisory support. In this way, field practicum may become not only a means of professional learning but also a more equitable educational model – one that does not exacerbate inequality between students but instead creates conditions for quality professional experience irrespective of the learner's starting resources.

The results of the study thus confirm that field practicum is an important mechanism for the development of professional skills among future social workers, as all five competency clusters increased statistically significantly following its completion. The most pronounced gains were recorded in communication skills and reflective practice, whilst the development of needs assessment, intervention planning, and ethical decision-making depended significantly on the type of practice setting, the complexity of the professional environment, and the quality of supervisory support. Synthesis of the data obtained demonstrates that the modernisation of field practicum must involve the substantive design of tasks, the differentiation of practice settings according to their educational potential, the strengthening of supervision, the digitalisation of practicum content, and the provision of socially equitable access for students to quality professional experience.

Conclusions

The study conducted confirms the central role of field practicum in the process of forming the professional skills of future social workers. In accordance with the aim of the study, it was established that field practicum ensures a statistically significant and practically substantial development of all key clusters of professional competencies among students of the specialty "Social Work". The greatest effect was identified for communication skills (Cohen's $d = 1.82$) and reflective practice ($d = 1.69$), confirming the significance of direct interaction with clients, with the specialists of the practice setting, and with instruments of reflective analysis in the process of transforming theoretical knowledge into practical skills. A somewhat smaller, though nonetheless significant, gain was observed in the skills of assessing client needs and resources, planning and implementing interventions, and ethical decision-making. This dynamic indicates the more complex structure of these competencies and the need for more sustained pedagogical and supervisory support for their full development.

It was established that field practicum should be regarded not merely as a stage of consolidating theoretical knowledge but as a multidimensional educational-professional space in which competency-based, experiential-activity, reflective, supervisory-partnership,

digital-innovative, socially just, and interdisciplinary approaches are integrated. This systematisation demonstrates that the effectiveness of practicum depends not on the fact of the student's presence at the host institution alone, but on the content of professional tasks, the quality of integration into the practical environment, the level of supervision, the opportunities for reflection, digital readiness, and the accessibility of quality practical experience. The empirical results demonstrated that the effectiveness of field practicum is determined by a number of interrelated factors. These include the type of practice setting, the content and complexity of tasks, the quality of supervisory support, the student's educational level, the presence of prior volunteer or employment experience, and the opportunity for systematic reflective engagement with practical experience. The type of host institution proved to be a significant factor in the differentiation of learning outcomes. Students who undertook practicum at rehabilitation centres and centres for persons with disabilities demonstrated higher indicators of development in communication skills, needs assessment, and intervention planning. This is explained by the specific character of the professional environment, in which work with persons with intellectual disabilities and complex functional limitations requires adaptive communication, the individualisation of approaches, and inter-disciplinary coordination. Conversely, organisations supporting internally displaced persons produced the highest indicators of development in ethical decision-making, reflecting the specific character of work under conditions of martial law, resource deficits, crisis demands, and the constant emergence of ethical dilemmas.

Prior volunteer or employment experience in the social field was associated with a higher baseline level of competencies at the start of practicum; however, following its completion, the difference between students with and without such experience notably decreased. This provides grounds for concluding that pedagogically organised field practicum with clearly defined learning objectives, supervisory support, and reflective instruments is a more powerful factor in competency development than unstructured practical experience. No substantial differences were identified in the intensity of competency gains between undergraduate and postgraduate students. Despite the fact that postgraduate students had higher baseline scores and concluded practicum with higher indicators, the dynamics of their development were comparable with those of undergraduates. This indicates that field practicum is an effective learning instrument for students at different educational levels, and that its developmental potential is not exhausted at the stage of initial training.

Analysis of the data obtained made it possible to outline the current challenges and directions for the modernisation of field practicum within the Ukrainian educational context. The main challenges include the uneven educational potential of practice settings, the insufficient structuring of complex professional tasks, the need for high-quality supervisory support, the digitalisation of social work, the social inequality of access to quality practical experience, and the emotional burden placed on students during work with vulnerable population groups. The prospects for the modernisation of field practicum are linked to a transition from the formal allocation of students to practice settings towards the substantive design of practical experience in accordance with the expected professional competencies. A differentiated approach to the selection of practice settings, taking account of which specific groups of skills each is most effectively able to develop, is advisable. At the same time, it is necessary to maintain the diversity of practice settings, since each professional environment forms a unique set of competencies important for the future activity of the social worker. Prospects for further research lie in the broadening of the study's focus through an assessment of the quality of supervisory support as an important determinant of field

practicum effectiveness, as well as in the conduct of longitudinal studies concerning the application of acquired skills during the first years of graduates' professional activity. The study of experience at other Ukrainian universities with a view to determining the universality of the identified patterns within the system of social work training also holds promise. Separate attention is warranted by an analysis of the influence of martial law on the content and forms of field practicum and on the adaptation of host institutions to conditions of limited resources and increased workload.

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Роль виробничої практики у розвитку професійних навичок майбутніх соціальних працівників

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Анотація. В умовах зростання соціальних викликів виробнича практика набуває ключового значення у підготовці фахівців соціальної роботи, однак її вплив на розвиток професійних умінь студентів залишається недостатньо дослідженим. Метою статті було визначення впливу виробничої практики на динаміку розвитку професійних навичок майбутніх соціальних працівників та оцінювання ролі типу бази практики, освітнього рівня і попереднього волонтерського або трудового досвіду у цьому процесі. Дослідження здійснено в межах кількісного описово-порівняльного дизайну. Вибірку становили 187 студентів Національного університету біоресурсів і природокористування України, які здобувають освіту у сфері соціальної роботи за спеціальністю І10 «Соціальна робота та консультування» з урахуванням стандарту вищої освіти за спеціальністю 231 «Соціальна робота». Анкетування проводилося до початку та після завершення виробничої практики. У дослідженні систематизовано підходи до розуміння виробничої практики як педагогічного феномену та виявлено статистично значущий приріст самооцінки всіх п'яти кластерів професійних навичок: комунікативних навичок, оцінювання потреб і ресурсів клієнта, планування та реалізації втручань, рефлексивної практики й етичного прийняття рішень. Найбільший ефект зафіксовано для комунікативних навичок і рефлексивної практики. Студенти, які проходили практику у реабілітаційних центрах та центрах для осіб з інвалідністю, продемонстрували вищі показники розвитку комунікативних навичок, оцінювання потреб і планування втручань. Практика

в організаціях підтримки внутрішньо переміщених осіб найбільше актуалізувала етичний компонент професійної підготовки. Попередній досвід забезпечував вищий стартовий рівень компетентностей, однак після завершення практики різниця між студентами з досвідом і без нього зменшувалася. Практичне значення дослідження полягає у використанні його результатів для оновлення програм виробничої практики, добору баз практики, розроблення методичних рекомендацій і посилення супервізійного супроводу майбутніх фахівців соціальної роботи

Ключові слова: практична підготовка; соціальна робота; професійна компетентність; супервізія; рефлексивне навчання; бази практики; професійна ідентичність

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Educational risks of AI integration into the training system for military specialists: Didactic and methodological aspects

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Abstract. The study was intended to carry out a comprehensive theoretical analysis of the pedagogical and methodological problems which are associated with the introduction of systems of artificial intelligence into training programmes in the defence sector. The research was based on a systematic comparison of strategic plans and regulatory acts in Ukraine, the USA and the Federal Republic of Germany, which was used for a comparison of approaches to the development of new professional competencies for the officer corps. The study found that the Ukrainian educational sector is developing according to a model of accelerated adaptation, where the implementation of a multi-level officer education system in line with North Atlantic Treaty Organization standards and the incorporation of extended distance learning courses have ensured the viability of institutions in combat conditions. The study determined that the USA prioritises the concept of rapid victory through flexible development cycles, whilst in Germany, the emphasis is on value-oriented engineering and independent programme validation. Statistical data confirmed the rapid growth of the AI-based military training market, which is set to reach USD 2.17 billion by 2030, in the context of a 24% increase in venture capital investment in specialist defence start-ups. The significance of the "human-in-the-loop" management principle has been identified, ensuring that responsibility for decision-making in complex tactical scenarios is maintained. The data revealed that the primary methodological issue remains the black-box effect, which, in the absence of algorithmic transparency, reduces staff confidence in technical tools. The practical significance of this is determined by its

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potential use by educational institutions to develop compulsory modules on query engineering, data verification and the ethical auditing of simulators

Keywords: digital literacy; educational environment; critical thinking; framework; gamification

Introduction

The rapid development of artificial intelligence technologies changed the structure of national security and defence and forced a radical rethink of teaching methods in the military training system. The integration of intelligent systems into the decision-making processes, strategic planning and the direct management of combat assets opens new opportunities, but also pedagogical risks. In the context of military conflicts, where the processing speed of large data sets is a decisive factor for survival, military education should not only guarantee the technical literacy but also foster the cognitive resilience of personnel in front of algorithmic errors and manipulation. The challenge of balancing technocratic progress with the preservation of human agency and the ethical responsibility of the officer corps is becoming a key challenge for military pedagogy, requiring an analysis of the methodological aspects of the introduction of artificial intelligence to the educational landscape of the world's leading nations.

O. Markiv *et al.* (2024) investigated the research and educational priorities for the use of artificial intelligence in building Ukraine's military capabilities in the context of a full-scale war. The researchers found that the effective development of the sector requires the creation of an open register of applied tasks, the prioritised introduction of dual master's programmes, and close cooperation between innovative institutions to achieve a technological advantage. The potential for using intelligent tools in secondary schools as a basis for training future personnel for wartime conditions was studied by O. Topuzov & S. Alekseeva (2024). The authors noted that the main tasks are the development of digital literacy through gamification and virtual assistants, which can be used for the maintenance of immersive learning even in the event of damage to the physical infrastructure of schools. Innovative approaches and the transformation of the educational process during hostilities were analysed by V. Gurkovsky *et al.* (2024), focusing on the integration of NATO planning standards. The researchers found that the use of virtual reality and simulators not only enhances the technical skills of multi-domain operations specialists but also influences the development of their psychological resilience to psychological stress. J. Spirnak & S. Antani (2024) explored the need to develop artificial intelligence training programmes for military medicine, considering learning algorithms as a means of improving treatment outcomes. The researchers concluded that the success of the reforms depends on the ability of new generations of military medical personnel to see machine systems not as a threat but as supportive colleagues in clinical workflows. M. Gaikwad & A. Choudhary (2025) studied the role of intelligent systems in the restructuring of military education through adaptive learning environments. The results showed that automating routine jobs allows more resources for mentoring but military professionals need to keep critical leadership skills in addition to technological skills. W. Combes (2025) explored effective human-machine interaction patterns in professional military education, separating command-and-control functions. The author identified three key conceptual vectors – strategic thinking, ethical responsibility and adaptive command – which should form the basis of the cognitive infrastructure of security sector institutions.

H. Putra & B. Mulyono (2024) investigated the paradoxical consequences of integrating

artificial intelligence into military education. The researchers found that the use of intelligent systems can enhance the effectiveness of training, personalise the learning experience and optimise data management processes. At the same time, the authors identified a range of critical threats, including risks of privacy breaches, the development of excessive dependence on technology among personnel, and the gradual decline of fundamental military skills. The findings of their work highlighted the need to develop a balanced educational policy that would take advantage of automation without compromising the basic combat readiness of future officers. N. Agarwala (2023) examined robotics and artificial intelligence as tools for reducing risks to personnel. The findings of the research demonstrated that, despite the economic benefits of reduced personnel costs, the implementation of such technologies requires the development of a comprehensive "roadmap" to maintain control over autonomous systems.

M. Mammadzada (2025) analysed the state of higher military education in Azerbaijan and its alignment with NATO and Turkish models. The author found that a shortage of personnel and logistical support is hindering the implementation of the interdisciplinary approaches required to train specialists in cybersecurity and leadership under new conditions. The revolutionary impact of large language models, in particular ChatGPT, on the military sphere and cyber defence was analysed by M. Hadi *et al.* (2023). The researchers found that the ability of algorithms to identify patterns in text radically changes human-computer interaction but requires constant updating of language mastery due to the vast volume of interactions. The impact of techno-nationalism on international cooperation in the field of defence artificial intelligence was investigated by D. Araya & M. King (2022). The findings confirmed that managing next-generation operations requires multilateral dialogue and expert discussion of states' intentions regarding the use of machine learning. A systematic review of the use of intelligent technologies in education in the Arab world was conducted by A. Alzahrani (2022), who studied strategies for responding to emergencies. The researcher found that the usefulness of a system is the dominant factor in its adoption, whilst the user-friendliness of interfaces in developing countries still requires improvement by developers.

Despite the wealth of academic literature, some gaps require further investigation. In particular, the specific pedagogical determinants of introducing artificial intelligence into the Ukrainian military education sector – covering the experience of intensive use of decision-support systems on the battlefield – remain understudied. There is also a lack of comparative analysis of the methodological risks of technocratic determinism in the training of specialists within different strategic cultures. The issue of didactic fragmentation within the Alliance requires further elaboration, as does the functional validation of ethical frameworks in the training of personnel in security and computer sciences. The study aimed to conduct a theoretical analysis of the pedagogical risks associated with the integration of artificial intelligence into the training system for military specialists, focusing on didactic and methodological aspects. To achieve this aim, the following tasks have been identified: to analyse the didactic transformation and pedagogical determinants of the introduction of artificial intelligence into Ukraine's military educational sphere; to investigate the evolution of military-technological didactics in the USA and Germany; to identify specific methodological tools and didactic frameworks for ensuring the reliability of intelligent systems in the training process.

Materials and Methods

The methodological framework of this theoretical study is based on a combination of general scientific and specialised research methods, which was used for a systematic analysis of the pedagogical risks associated with integrating artificial intelligence into the training system for

military specialists. Three representative jurisdictions were selected as the subject of the research, each demonstrating different strategies for introducing innovations into the military education sector: Ukraine (as a model of extreme digital transformation and the testing of technologies in conditions of full-scale war), the USA (as a representative of a model of forced technological adaptation and pragmatic dominance) and Germany (as a representative of an ethics-centred approach and value-oriented engineering). The choice of these countries was dictated by the need to compare didactic frameworks under conditions of varying degrees of security threats and levels of technological development. The first fundamental research tool was the formal-legal (dogmatic) method. It was applied to the analysis of the regulatory framework and strategic documents governing the principles of the use of intelligent systems in the defence and education sectors: Resolution of the Cabinet of Ministers of Ukraine No. 1556-r … (2021), materials of the U.S. Department of War (2020), U.S. Department of Defense (2022). In addition, the provisions of the EU Artificial Intelligence Act (n.d.) were analysed to identify current approaches to the regulation and implementation of artificial intelligence systems. The method was used to establish the structure of legislation on artificial intelligence, to define the limits of the procedural legitimacy of using automated systems in training, and to identify the regulatory factors that shape the qualification requirements for future officers. The key research methods employed were the comparative legal and comparative methods. These were used to compare institutional models, didactic strategies and methodological approaches to the training of military specialists in the countries under study: European Parliament (2025), NATO (2021; 2024b). In addition, information published by ArmyInform (2026) was used to supplement the analysis of current practices and developments in military education. The application of this method aimed to identify points of convergence in the architecture of educational platforms, establish specific national characteristics in approaches to "Mission Command", and assess the degree to which national programmes comply with NATO interoperability standards.

The systemic-structural method was applied to the analysis of organisational mechanisms for integrating artificial intelligence into military training. The study examined the structures and initiatives of the U.S. Department of Defense (2023) and NATO (2023; 2025). The aim of applying the method was to study the architecture of advanced distributed learning (ADL) systems, analyse the functioning of immersive AR/VR simulators, and establish the role of specialised innovation centres in ensuring the continuity of personnel professional development. A hermeneutic approach and content analysis were used to interpret the content of pedagogical concepts and ethical principles in UNESCO's international recommendations (2021; 2023), the European Defence Agency (2025). In addition, the provisions of ISO/IEC/IEEE 24748-7000:2022 (2022) were analysed to identify methodological and ethical requirements for the implementation of intelligent systems. The method was used to reveal the essence of concepts such as "automation bias", "cognitive atrophy" and "algorithm explainability", which were used for an assessment of the ideological underpinnings of ethical standards and their impact on the methodology for developing critical thinking in cadets.

A statistical method was employed to verify operational efficiency and market trends. The analysis covered quantitative data and industry forecasts (Stockholm International Peace Research Institute, 2025; Research and Markets, 2026). The method was used to measure the dynamics of the military AI training market, assess the volume of investment in defence start-ups, and determine the proportion of automated operations in training processes, which forms the basis for assessing the scale of potential teaching errors. The comprehensive combination of these methods ensured the reliability of the scientific conclusions.

Results

Didactic transformation and pedagogical determinants of the integration of artificial intelligence into Ukraine's military education sector. The integration of artificial intelligence (AI) technologies into the training system for military personnel in Ukraine is occurring amid a period of extreme digital transformation triggered by the Russian Federation's full-scale armed aggression. By 2026, Ukraine had become a military laboratory for the implementation of AI, where the latest developments are being tested directly on the battlefield (European Parliament, 2025). However, such rapid technological development creates specific pedagogical risks related to the didactic and methodological aspects of the professional training of future officers (Makarov, 2025). The didactic challenge includes the need to balance the rapid mastery of innovative tools with the preservation of a military leader's cognitive autonomy.

Educational science views AI as a system capable of mimicking human intellectual processes, such as the ability to reason, identify meanings and learn from experience (Clement, 2024). For military education, this means a shift towards training systems that can observe, evaluate and make decisions at a level that previously required exclusively human expertise. According to international approaches, AI is a machine-centred system that, based on the input data received, concludes how to generate outputs in the form of predictions or recommendations that affect the real world. As far as 2021, the regulatory framework for this process was developed by the Resolution of the Cabinet of Ministers of Ukraine No. 1556-r ... (2021), which defined defence and education as priority areas of state policy. The main problem in accordance with this document is low level of digital literacy and absence of special educational programmes meeting modern requirements. The concept revealed several problems in the national training system: low level of mathematical competence among school leavers, which hinders further research in the field of AI; absence of modern professional development programmes for teachers at military universities; and outdated data protection systems.

Another key factor is the lack of a unified ethical framework for the development of AI technologies across various areas of national security. In response, the state has set the task of promoting the competent use of AI across the entire population and bringing legislation into line with the standards of the OECD (2024). The concept envisages reforming the higher military education system by 2030, with the key objective being the creation of interdisciplinary master's programmes and the integration of leading online courses into the teaching process. The educational risks in this area are primarily cognitive in nature. The use of GenAI in the learning process may lead to the phenomenon of "writing without thinking". For a military specialist, whose work requires structured logical analysis under time pressure, delegating basic mental operations to algorithms poses a risk of "atrophy" in the ability to make independent decisions. UNESCO (2023) warns that over-reliance on AI tools could undermine the development of critical thinking skills and the ability to solve complex problems, which are essential for managing combat operations. The methodologists emphasised that GenAI can automate only lower levels of cognitive skills, providing "semi-finished" knowledge that creates an illusion of competence. In military education, this creates a risk of losing diversity of thought, as GenAI models inherently reproduce the dominant worldviews embedded in their training data and may ignore alternative or minority approaches to solving tactical problems. A methodological risk also includes the problem of AI-generated information – the ability of models to generate information that is factually incorrect but plausible (UNESCO, 2023). In the context of military tactics or strategic planning, acting on such advice from AI-based decision-support systems could have fatal consequences. Researchers emphasise that GenAI lacks awareness of the real world and social relations, and merely statistically predicts the next elements in a data chain. Consequently, the

approach to military training in Ukraine in 2025-2026 is shifting from the mere accumulation of knowledge to teaching methods for verifying and critically evaluating AI output data.

A key stage in the transformation of the training system in Ukraine was the institutional audit of higher military education conducted by a NATO expert group in 2025 (ArmyInform, 2026). The main objective of the audit was to confirm progress in bringing training into line with NATO (2022) standards, in particular, the introduction of a multi-level system of professional military education (L-1 to L-5) for officers and the reform of training for non-commissioned officers. The experts noted the successful integration of NATO planning and decision-making standards (TLP, MDMP, OPP) into the curricula of Ukrainian military universities. In particular, Ukraine has successfully implemented the principles of "Mission Command" into its combat training programme, which is essential for interoperability with Alliance forces. The audit also confirmed the recognition of military professions within the National Qualifications Framework and the raising of English language proficiency requirements in accordance with STANAG 6001. The training model is focused on developing an "AI-ready workforce" – personnel who not only possess technical skills but also comprehend the strategic implications of using AI in multi-domain operations. However, the transition to NATO (2021) standards requires not only organisational changes but also adherence to the Principles of Responsible Use. NATO's updated Strategy (2024b) on AI identifies six key principles: legality, accountability, explainability, reliability, controllability and mitigation of bias. For Ukrainian military educators, this means the need to develop teaching methods that explain to cadets (students) not only how AI works, but also the ethical standards by which it must operate. It highlights in particular the principle of the "human-in-the-loop", which ensures that responsibility for the use of force is never lost by the human (NATO, 2021). The principle of "Explainability and Traceability" requires transparency in the training processes: cadets should be aware of the sources upon which the decision of the AI is based and the ways by which it was verified. The "controllability" of the system means that it can be shut down in case of unintended behaviour. Future officers need to have the skills to stress-test algorithms.

Furthermore, NATO (2024b) highlights the risk of AI being misused by state and non-state actors for disinformation and the manipulation of public opinion, which adds a methodological dimension to the training of strategic communications specialists. The didactic aspect also covers the implementation of ADL (NATO, 2025). As of October 2025, the NATO DEEP eAcademy course catalogue contains specialised modules in Ukrainian, including training on cyber defence (ADL 076), resource management (ADL 116) and the fundamentals of integrity education (ADL 336). The ADL 076 course provides basic terminology and teaches how to recognise social engineering and phishing, which form the basis of a military professional's digital hygiene. The RMEP programme (ADL 116) explains the Alliance's complex financial systems, ensuring an awareness of the resource architecture. A new segment of courses, such as "Will It Work Online?", emphasises pedagogy, helping instructors to balance the relationship between teacher, student and content in a digital environment.

The use of such platforms implements the concept of "lifelong learning", but poses a challenge for teaching staff regarding the authenticity of knowledge assessment. The risk of academic misconduct using ChatGPT is forcing lecturers to rethink the design of assignments, shifting the focus towards practical exercises and simulation modelling of combat situations (UNESCO, 2023). Military training in Ukraine actively utilises simulation and cognitive modelling (Resolution of the…, 2021). AI in military games can be used to practise scenarios in an environment where mistakes are safe to make (NATO, 2025). However, this raises the risk of "algorithmic bias". If the data on which the model was trained contains

gender or ethnic stereotypes, AI may produce discriminatory recommendations. UNESCO (2021) emphasises that training in AI ethics must become a mandatory component of curricula at all levels to minimise these risks.

The educational landscape is also subject to economic and market forces (Research and Markets, 2026). The worldwide AI in military training market is projected to reach USD 2.17 billion by 2030. The key drivers are immersive AR and VR solutions and predictive mission planning systems. For Ukraine, this means the need to train not only users, but specialists who can manage the "collective intelligence" of humans and machines. European Defence Agency (2025) report on the dynamic field of operational design in the military sector is of great importance. Civilian training is usually done in stable conditions, but military AI tools have to constantly adjust to enemy manoeuvres. And so, there is a methodological problem, that training materials get outdated quickly. The European Parliament (2025) noted that the pace of innovation in the AI field is outstripping the development of legal and pedagogical doctrine. In Ukraine, this is being done by involving the IT industry in the development of qualification requirements and organising internships for lecturers at technology companies.

One particular risk is the psychological effect of AI on learners. Algorithms simulating human interaction may have unpredictable effects on cadets' emotional well-being and ability to social cohesion (UNESCO, 2023). In the course of teaching "human justice" and training in the Armed Forces of Ukraine, it is necessary to take into account that AI is an auxiliary tool, not a substitute for a mentor. The principle of "Responsibility and Accountability" requires instructors to clearly define the areas of responsibility. The developer is responsible for the technical soundness of the model, but the decisions that are made based on the data from the model are the sole responsibility of the person who has taken the advice. As part of the training of security and computer science specialists in Ukraine in 2026, the key focus is on "Bias Mitigation" – proactive steps to minimise unintentional bias in datasets. This requires cadets to master the nature of data and the methods used to process it. Teaching is evolving into a process of developing an "AI-ready workforce" – personnel who are aware of the limitations of the technology and are capable of operating in situations where AI becomes unavailable due to hostile interference or technical failures (NATO, 2024b). Table 1 summarises the pedagogical requirements and didactic tools for ensuring the reliability of AI in military education.

Table 1. *Functional matrix of pedagogical requirements and didactic tools for ensuring the reliability of AI systems in military education*

Area of integration	Key pedagogical principle (NATO/DoD/ UNESCO standards)	Educational risks and methodological limitations	Risk mitigation tools and certification (ADL/EDA/Concept)
Ethical and legal training	Legality and Liability: separation of actions of the algorithm and the commander's discretion	Dehumanisation of procedures; blurring of legal accountability for life-or-death decisions	ADL 336 courses (Integrity Education); implementation of the CEPEJ Code of Ethics in military games
Cognitive development	Explainability and Traceability: cadet's ability to explain the logic of AI	"Cognitive atrophy"; the phenomenon of "writing without thinking"; uncritical acceptance of GenAI "hallucinations"	The "Human-in-the-loop" methodology, using 67 intelligent templates from the eCase system to verify evidence
Technical assessment	Reliability and controllability: stable operation in areas without GPS coverage	"Digital rollback"; vulnerability to cyberattacks (phishing, social engineering); algorithmic data bias	ADL 076 training courses (Cyber Security); testing at AI Factories; the VAULTIS framework for data quality assessment

Table 1. *Continued*

Area of integration	Key pedagogical principle (NATO/DoD/ UNESCO standards)	Educational risks and methodological limitations	Risk mitigation tools and certification (ADL/EDA/Concept)
Operational management	Interoperability: compliance with STANAG 6001 and TLP/ MDMP standards	Technology gap; outdated curricula relative to the market (USD 2.17 billion)	NATO PME audit (L1-L5); immersive AR/VR simulators; predictive mission planning in accordance with the Tanzimat 2030 Strategy
The socio-psychological sphere	Reduction of bias: inclusivity and non-discrimination	Perpetuation of stereotypes (gender-based/ethnic); a decline in social cohesion within departments	Modules ADL 168/169 (Gender Issues); resocialisation based on AI analysis in accordance with the 2021 Concept

Note: *VAULTIS – Visible, Accessible, Understandable, Linked, Trustworthy, Interoperable, Secure*

Source: *compiled by the authors based on U.S. Department of War (2020), Resolution of the Cabinet of Ministers of Ukraine No. 1556-r … (2021), NATO (2021; 2023; 2024a; 2024b), UNESCO (2021; 2023), U.S. Department of Defense (2023), S. Clement (2024), European Parliament (2025), Stockholm International Peace Research Institute (2025), European Defence Agency (2025), European Commission (n.d.)*

An analysis of pedagogical requirements has revealed a systematic correlation between the technological complexity of AI and the need for cognitive autonomy among military professionals, with the central methodological challenge being to counter the risk of dehumanisation in decision-making through the implementation of the Alliance's ethical safeguards. The proposed toolkit for neutralising threats reshapes the very architecture of military training, shifting the focus from mechanical mastery of interfaces to the professional verification of algorithmic predictions using the eCase system's intelligent templates and specialised ADL modules. The implementation of the principles of explainability and traceability acts as a factor in preventing "cognitive atrophy", as cadets are compelled to construct independent logical arguments in parallel with those of the machine, ensuring the genuine realisation of the "human-in-the-loop" concept even in scenarios involving high-intensity combat operations. This approach transforms technical expertise from a narrow IT specialisation into a leadership competence, where system reliability is guaranteed not only by the software code but also by a culture of ethical auditing fostered within the officer corps and the ability to adaptively manage operations amid the dynamic shifts of a multi-domain conflict.

Thus, the basis of Ukraine's educational strategy for the introduction of AI into the military education and training system is the triad of digital literacy, ethical responsibility and cognitive resilience. The main educational goal remains the training of specialists who can critically evaluate the "stochastic patterns" of AI models and make autonomous decisions in critical situations, guided by the values of a democratic society and the norms of international humanitarian law. The application of AI in education is seen as a way to augment human capabilities, not to automate military intelligence.

The evolution of military-technological didactics in the US and Germany: Adaptation strategies, ethical validation and the risks of technocratic determinism. The reconfiguration of military training systems in the US and Germany by 2026 reflects the desire of leading Western nations to secure a technological advantage through the integration of AI into training and operational processes. However, the approaches of these countries differ: whilst the US focuses on a model of forced adaptation and "quick victory" through agile development cycles, Germany emphasises value-oriented design and the preservation of the "human element" in military management (European Parliament, 2025). Both jurisdictions view AI as a fundamental technology that will transform

the full spectrum of NATO's tasks (2021): from collective defence to crisis management. The US didactic strategy is based on documents from the U.S. Department of Defense (2022), which define AI as a means of maintaining military superiority. A key institutional step was the creation in 2021 of the Office of the Chief of Digital and Artificial Intelligence (CDAO), which consolidated previous initiatives, such as the JAIC, to scale solutions across the entire Pentagon. In November 2023, a document from the U.S. Department of Defense (2023) was published, which replaced previous plans and introduced a hierarchy of AI needs (from data quality (the foundation) to responsible AI (the pinnacle)).

For US military education, this means a shift towards a model of "upskilling and reskilling". Military universities and training centres are introducing targeted programmes to develop personnel capable of working with data as a product with clearly defined value and accountability (U.S. Department of Defense, 2023). However, the methodological risk in the US model is the conflict between the speed of implementation and the reliability of systems. The adoption of the "Agile" approach, where feedback between the developer and the user must take place within hours or days rather than years, presents a pedagogical challenge regarding the depth of cadets' mastery of the material. There is a risk that, in the context of training campaigns, military specialists will be focused on operating minimally viable products without a fundamental awareness of the internal logic of algorithms, which in real combat could cause "automation bias" – complete reliance on machine recommendations. The ethical component of specialist training in the US is governed by the AI Ethics Principles (U.S. Department of Defense, 2020), adopted in February 2020. These cover five areas: accountability, fairness, traceability, reliability and controllability. The pedagogical significance of these principles lies in fostering a culture of "sound judgement" among personnel. This requires US education not only to teach technical skills, but also to develop the cognitive ability to deactivate systems that exhibit unintended behaviour.

The German model of military training in the context of the "Zeitenwende" has demonstrated an approach in which AI is viewed primarily as a means of enhancing the Bundeswehr's survivability (European Parliament, 2025). Germany's National AI Strategy, updated in 2020, covers the defence sector; however, the 2023 Military Guidelines integrate AI into the context of digital transformation (Organisation for Economic Co-operation and Development, 2020). A key hub for innovation is the Bundeswehr's "Cyber Innovation Hub", which works with technology start-ups to solve tactical tasks in the form of an "artificial intelligence laboratory" (Clement, 2024). The didactic approach in Germany is based on the "Human-in-the-Loop" concept. In German military-pedagogical doctrine, this is viewed not merely as a technical safety protocol but as a fundamental ethical and didactic imperative that ensures the preservation of an officer's moral agency in the context of total digitalisation (Spriz, 2025). It involves the direct integration of human judgment into every decision-making cycle of an automated system, where the human acts not merely as the final verifier but as an active participant capable of interrupting or altering the algorithmic process at any point. From an educational perspective, this approach requires a shift from teaching cadets' basic skills in operating interfaces to developing a high level of "cognitive control capability", based on an awareness of the internal logic of AI and the ability to recognise when a machine is exceeding the limits of its competence.

In contrast to American pragmatism, German military pedagogy is based on "value-oriented engineering" and the ISO/IEC/IEEE 24748-7000:2022 (2022). This requires the introduction of a new professional role within military structures – the "Value Lead", whose task is to ensure that AI systems do not violate the ethical standards underpinning Germany's constitutional order during their development and operation. The methodological risk for the German training

system is related to the "black box" nature of AI models. The Bundeswehr is investigating the issue of "explainability" through the AI Observatory at Helmut Schmidt University (European Defence Agency, 2025). The pedagogical problem is that the level of trust in the tool drops if the operator does not know how the system arrived at a certain conclusion, thus negating the technological advantage. In response, German pedagogy is moving towards teaching the "verification of the validity" of input data, rather than merely following protocols. The European Union is a supranational regulatory body that impacts the German security sector through the EU Artificial Intelligence Act (n.d.). Although this act excludes military applications, it establishes a general framework for risk management (four levels) and transparency requirements, which the Bundeswehr is integrating into its training programmes to ensure "dual compliance" (civilian and military) (Clement, 2024). The 2025 "AI Continent Action Plan" (European Commission, n.d.), which provides for the establishment of an AI Skills Academy, the outcomes of which will form the basis for training technical personnel within the security forces, is also central.

A common challenge for the US and Germany is "didactic fragmentation" within the Alliance. Through the DIANA programme and the Innovation Fund, NATO (2024b) is seeking to standardise approaches to TEV&V (testing, evaluation, verification and validation). In 2024, it was emphasised that military test centres should determine the safety of applications in accordance with the Principles of Responsible Use, which requires instructors at military academies in both countries to use common assessment templates and simulation scenarios. The methodological aspect of training in the US and Germany also includes countering "digital poverty". As AI models are often trained on data from domestic countries, there is a risk that future officers will develop misconceptions about socio-cultural contexts in other regions. UNESCO (2023) warns that this could lead to the colonisation of standards and the marginalisation of alternative tactical solutions. For the US, which operates on a global scale, this creates a risk of strategic errors in the training of specialists for peacekeeping or coalition operations. Training methodology in the US actively utilises the "Maven" project and the "Replicator" initiative for training computer vision systems, which requires personnel to possess the skills to annotate large datasets (European Parliament, 2025). In Germany, however, the focus is shifting towards "resource-efficient learning" – the development of algor thms that require minimal amounts of data and energy, which is essential for the European context with its limited resources. A particular pedagogical risk is the "hallucinations" of large language models, which are becoming increasingly common tools in training environments. As OpenAI notes, even the most advanced models, such as GPT-4, are prone to inventing facts. In the training of staff officers in the US and Germany in 2025, compulsory "Prompt Engineering" modules were introduced, which teach not only how to formulate tasks but also how to verify references to non-existent regulations or combat orders generated by AI.

Systemic risk is also associated with the ability of adversaries, such as Russia, to use AI for disinformation and to undermine trust in military institutions within democratic societies (NATO, 2024b). This has led both countries to incorporate "cognitive security" training into their curricula. Military instructors teach cadets to recognise deepfakes and AI-driven information operations that could demoralise troops in times of conflict. The economic component of specialist training in the US and Germany is underpinned by the growth of the AI training market. In 2025, venture capital investment in European defence start-ups, such as Helsing (a partner of the Bundeswehr), rose by 24%, reaching USD 5.2 billion (European Parliament, 2025). In the US, similar processes are leading to the creation of the USD 500 billion "Stargate Project" ecosystem for the development of AI infrastructure, which includes training facilities. This poses a methodological challenge

of "technological debt" – outdated monolithic systems in military academies that cannot keep pace with updates to commercial AI solutions. To systematise the didactic requirements and operational standards that determine the direction of military training development in leading Western countries, a comparative analysis of AI reliability assurance tools has been developed (Table 2).

Table 2. *Methodological tools and didactic frameworks for the training of military specialists in the USA and Germany*

Comparison criteria	USA (CDAO model)	Federal Republic of Germany (the Bundeswehr model)	Educational significance for NATO
Basic data management standard	Implementation of the VAULTIS framework	Focus on "Data Sovereignty" and the protection of personal data following the General Data Protection Regulation (GDPR)	Development of skills in managing data as a strategic asset for the mission
Verification Methodology (TEV&V)	"Agile Feedback Loop": iterative testing between developers and end users	"Product-neutral evaluation": independent expert assessment of compliance with military safety standards	Standardisation of AI application certification procedures within the Alliance
Priority market segment	"Predictive Mission Planning": predictive planning and logistics systems	"Immersive AR/VR Training": immersive learning using virtual and augmented reality	Shift from static to dynamic training scenarios
Technical paradigm of learning	"MLOps": full model lifecycle automation	"Frugal AI": training on limited data sets to improve autonomy	Adaptation of specialists to conditions of limited resources and communication
Level of pedagogical autonomy	Transition to "Dynamic Delegation of Authority"	Retaining strict "Meaningful Human Control" at the points where life-or-death decisions are made	The division of responsibility between a person and an autonomous system

Source: *compiled by the authors based on analysis of U.S. Department of Defense (2023), NATO (2024b), European Defence Agency (2025), European Parliament (2025), Research and Markets (2026)*

An analysis of the data presented has shown that, as of 2026, training in the US is based on the implementation of the VAULTIS standard, which requires security and computer science professionals to master the information lifecycle (U.S. Department of Defense, 2023). This shifts the focus of training from the simple use of interfaces to the professional assessment of data quality at all stages – from collection to disposal. In contrast, the German training model emphasises independent validation, which is necessary to ensure military personnel's trust in systems operating in an electronic warfare environment (European Defence Agency, 2025).

The diversification of market-based solutions is of particular educational significance: whilst the US invests in predictive planning to accelerate the OODA loop, Germany focuses on immersive simulators to improve personnel survival rates (European Parliament, 2025). The comparison of the two approaches confirmed that modern military pedagogy is forced to solve the problem of "dynamic delegation of powers" when cadets are taught not only to operate machines, but also to determine the boundaries of AI autonomy depending on the degree of threat and the ethical complexity of the situation in the combat zone. Consequently, the integration of the technical MLOps paradigm with the concept of "lean AI" is becoming a key necessity for the creation of interoperable NATO forces able to operate effectively in multi-domain conflict environments. Overall, the comparison shows that the educational transformation in the US and Germany reflects the recognition of AI as a "force multiplier" that requires a new pedagogical paradigm. The US is building a flexible, iterative model for developing digital talent within the CDAO. Germany is

building a system of "trusted AI" through value-based engineering and ethical auditing. A key pedagogical risk for both countries remain the loss of "human agency" as a result of placing excessive trust in algorithms. The primary educational task is to train soldiers capable of acting autonomously in wartime conditions, exacerbated by AI-driven disinformation, and of maintaining control over technology at critical decision-making points that determine life and death.

Discussion

The findings of this study revealed that the integration of artificial intelligence into the training system for military specialists has evolved from a technical innovation into a pedagogical challenge, necessitating a fundamental review of the methodological foundations of teaching. The finding established during the study that institutional support was a decisive factor in successful digital transformation was corroborated in the study by A. Lakshmi *et al.* (2023). Based on the example of the United Arab Emirates, the authors demonstrated that digital technologies had a tangible impact on all aspects of higher education only when the organisation was active in the integration process, which was fully consistent with the findings of this study regarding the need for strategic management of AI implementation in military colleges. At the same time, the divergence identified in this study between the US, Germany and Ukraine regarding levels of technological maturity correlated with the conclusions of A. Bestyuk & S. Pokhnatiuk (2025). The researchers noted that although the integration of AI was strategically relevant for all the countries studied, its implementation was driven by different priorities: large-scale implementation in the US and the UK, as opposed to Germany's structured but measured approach. A separate aspect of the discussion was the issue of how AI technologies are perceived by military personnel. The functional matrix of pedagogical requirements developed in this study found its psychometric complement in the study by L. Hadlington *et al.* (2023). Researchers developed the "Attitudes toward AI in Defence" scale, which identified two key factors influencing attitudes towards the technology: "positive outcomes" and "negative consequences". The findings of this study regarding cognitive risks coincided with the public concerns identified by L. Hadlington *et al.*, highlighting the significance of the development of an "AI-ready workforce" not only through technical skills but also by addressing cadets' psychological attitudes. In the context of immersive learning, the findings of this study regarding the use of AR/VR simulators were compared with the position paper by G. Hwang & S. Chien (2022). The authors explored the potential of the metaverse in education, highlighting the role of AI as a facilitator of interaction, which aligns with the findings of this study regarding the need to use simulation modelling to reduce risks to personnel.

The methodological aspects of training specialists in security and computer science, analysed in this study, are theoretically underpinned by M. Khaleel *et al.* (2024). The researchers provided a comprehensive overview of AI techniques, from machine learning to computer vision, emphasising their role in enhancing decision-making performance. This study supplemented this analysis with the specifics of military didactics, where, according to J. Schraagen (2023), the responsible use of AI required consideration of the human factor and ergonomics. The author emphasised that the irony of automation continued to apply in the AI era, requiring increased moral situational awareness during system deployment. These arguments formed the basis for justifying the "Human-in-the-loop" principle, which in this study was identified as a key safeguard against didactic atrophy of thought. The issue of training military engineers, examined in this study through the lens of the 2021 concept, was discussed in comparison with the findings of V. Chmyr & N. Bhinder (2023). The researchers identified the main areas of AI application for developing the professional competencies of future engineering officers but noted a range of

challenges that hindered the transformation. This study confirmed the existence of these barriers, particularly regarding "technological debt" and the rapid obsolescence of training materials. Similarly, the successful experience of introducing game mechanics in Ukrainian higher education institutions, as described by I. Savina & N. Shostakivska (2025), demonstrated that gamification increased cadets' motivation and their ability to act in conditions of uncertainty. These findings were consistent with the results obtained in this study regarding the effectiveness of immersive simulators for practising tactical scenarios.

The issue of digital literacy among future teachers deserves attention in the discussion. N. Tytova & K. Mereniuk (2022) analysed the Ukrainian experience of teaching media literacy in the context of aggression, finding that state support and online platforms provided a sufficient level of preparation for students. This study extended this conclusion to the field of military education, where knowledge of methods to counter deepfakes and AI-generated disinformation has become part of "cognitive security". The importance of this approach was highlighted in a review by K. Enstad & A. Hagen (2026), who identified a lack of competencies of a junior officer across EU countries, making this study's contribution to the systematisation of NATO standards particularly relevant. The findings of this study on military training were compared with the study by J. Peacock *et al.* (2025). The authors demonstrated that preparation for future full-scale combat required medical personnel to be able to work under resource-constrained conditions using AI tools. Furthermore, F. Bahramnezhad *et al.* (2025) emphasised that the use of generative AI for scenario-based training can be used for the optimisation of resources but required oversight of data privacy. The impact of generative AI on academic integrity and cognitive skills was analysed in the context of studies by P. Kelly & H. Smith (2024). The researchers recommended avoiding extremes – ranging from a complete ban to uncritical acceptance – and incorporating "safeguards" into training programmes. This study put this pragmatic approach into practice by recommending a review of the design of tasks for cadets. Furthermore, A. Rashid *et al.* (2023) emphasised that AI enhanced the autonomy of combat systems, requiring officers to develop new skills in "strategic thinking". In the context of increased motivation, the findings of H. Putra *et al.* (2024) confirmed that the use of AI had a positive impact on learning effectiveness in a military environment, which was consistent with the effect of implementing ADL courses identified in this study.

Lastly, international experience of digitalisation, in particular the Latvian case described by M. Spridzans (2023), has shown that the pandemic served as a catalyst for preparing instructors for future trends. This correlated with the findings of this study regarding the adaptability of Ukrainian military higher education institutions during the war. An examination of the Chinese experience, as outlined by E. Kania (2022), revealed an alternative model of "intellectualised" warfare, which underscored the need for NATO to maintain pedagogical flexibility to counter adversaries employing different strategic logic. The role of AI as a strategic factor identified in this work is consistent with the research by G. Okropiridze & L. Zaalishvili (2025), who demonstrated that the integration of intelligent systems expands the cognitive, operational and logistical capabilities of the armed forces without a proportional increase in personnel numbers. The didactic transformation and transition to NATO standards described in this study are further explained in the comparative analysis by T. Libel & B. Ateş (2025). The researchers identified a consistent trend towards the convergence of professional military education with the academic standards of civilian universities, which has made it possible to dismantle the traditional military monopoly on the training of the officer corps. This confirmed the advisability of introducing a multi-tiered education system in Ukraine as a means of enhancing the professional legitimacy of the officer corps through the

diversification of training programmes and the involvement of external academic expertise under the auspices of the Joint Chiefs of Staff. Lastly, the methodological risks associated with the use of generative AI were detailed by A. Barros Junior *et al.* (2025). The researchers noted the irreversibility of AI use in military research but emphasised the need for "AI literacy" to neutralise algorithmic biases and content distortions. The results of their analysis confirmed the thesis of this study that the uncontrolled use of intelligent models without clear ethical boundaries poses direct threats to the cognitive development of future military leaders and may negatively impact the strategic stability of the state in the digital age. To summarise the above, the findings of this study demonstrated that global military pedagogy is at a point of bifurcation. A comparison of the results with the works of other authors confirmed the pattern of transition from the accumulation of knowledge to the development of the ability to verify algorithmic conclusions. The significance of the findings is determined by the identification of pedagogical safeguards that will ensure the preservation of human agency in the context of total digitalisation.

Conclusions

As a result of the theoretical research conducted, the set objective was achieved, and the research tasks concerning the analysis of pedagogical risks associated with the integration of artificial intelligence into the training system for military specialists were resolved. The study has established that global military didactics has shifted from a model of mere accumulation of knowledge to the development of the ability to verify algorithmic conclusions and preserve human agency in the context of the total digitalisation of the battlefield. The study established that the Ukrainian military education sector is undergoing a period of radical transformation, with artificial intelligence technologies being tested directly in combat conditions. The study established that the introduction of a multi-level system of professional military education for officers in accordance with NATO standards (levels L-1 to L-5) and the integration of Advanced Distributed Learning courses ensured adaptation of Ukrainian curricula to the requirements of multi-domain operations. Quantitative indicators highlight the importance of this process: the projected size of the global market for AI-based military training is set to reach USD 2.17 billion by 2030, whilst venture capital investment in relevant European start-ups has risen by 24% in the last year alone.

An important achievement of the transformation in Ukraine has been a change of the educational paradigm to the formation of cognitive resilience and ability to stress-test algorithms. The differences between the US and the German approach are analysed and it is concluded that inclusive training models are more effective. The study shows that the American model led by the Office of the Chief Digital Officer is based on the idea of a "quick win" and a flexible development cycle, while the German Bundeswehr is based on value-oriented engineering and independent system validation. The study confirmed that the introduction of the VAULTIS standard in the US and the establishment of the role of Chief Value Officer in Germany are important methodological safeguards against "automation bias". The results of the study show that without learning the ethical standards of interaction with machines, successful training of military personnel in 2026 will be impossible. The main pedagogical danger described in the research was the "black box" nature of algorithms that, in the absence of explainability, destroys the operator's confidence and causes errors in mission planning. The data confirmed the successful implementation of the "human-in-the-loop" principle as a fundamental requirement of the Alliance, that responsibility for the use of force had been retained. Areas for further research in this field could include the empirical verification of the effectiveness of specific didactic models for training military personnel to interact with autonomous systems under combat stress, the development of

national standards for assessing officers' cognitive readiness for the critical analysis of algorithmic recommendations, as well as research into the psychological and pedagogical mechanisms underlying the emergence of "automation bias" with a view to developing appropriate methodological tools for its prevention within Ukraine's military education system.

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Педагогічні ризики інтеграції ШІ у систему підготовки військових фахівців: дидактичні та методичні аспекти

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Анотація. Метою проведеного дослідження став комплексний теоретичний аналіз дидактичних і методичних загроз, що виникають під час впровадження систем штучного інтелекту у навчальні програми оборонного сектору. Наукове вивчення ґрунтувалося на системному порівнянні стратегічних планів і нормативних актів України, США та Федеративної Республіки Німеччина, що дозволило зіставити підходи до формування нових професійних компетенцій офіцерського корпусу. У ході роботи встановлено, що український освітній простір розвивається за моделлю прискореної адаптації, де впровадження багаторівневої системи офіцерської освіти згідно зі стандартами Організації Північноатлантичного договору та залучення курсів розширеного дистанційного навчання забезпечили життєздатність інституцій у бойових умовах. Виявлено, що у США пріоритет надається концепції швидкої перемоги через гнучкі цикли розробки, тоді як у Німеччині акцент зміщено на ціннісно-орієнтовану інженерію та незалежну валідацію програм. Статистичні дані підтвердили стрімке зростання ринку військового навчання на базі штучного інтелекту, який досягне 2,17 млрд доларів до 2030 року, на тлі збільшення венчурних інвестицій у профільні оборонні стартапи на 24 %. Визначено значення принципу «людини в контурі» управління, що гарантує збереження відповідальності за прийняття рішень у складних тактичних сценаріях. Дані засвідчили, що основною методичною проблемою залишається ефект чорної скриньки, який за умови відсутності пояснюваності алгоритмів знижує рівень довіри особового складу до технічних інструментів. Практичне значення результатів полягає у можливості їх використання навчальними закладами для розробки обов'язкових модулів з інженерії запитів, верифікації даних та етичного аудиту симуляторів

Ключові слова: цифрова грамотність; освітній простір; критичне мислення; фреймворк; гейміфікація

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Role balance of Ukrainian university students during wartime

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Abstract. Balancing work, study, and personal life was a major concern among university students. This study aimed to answer the research questions concerning challenges Ukrainian university students face while balancing roles within education, employment, and personal life during wartime and the strategies which can help Ukrainian university students to balance work, study, and life roles. Research indicated that conflicting roles and demands lead to emotional exhaustion, stress, and anxiety. Inter-role conflict theory served as the basis for this research, and the findings supported its main principles: the competing interests of different fields create role conflict, which affects the individual in all spheres. This study employed a mixed methods design. A survey was conducted among 80 Ukrainian university students. 62.5% of the surveyed prioritise academic work, 37.5% prioritise part-time job. 57.5% of Ukrainian respondents do not have enough time for hobbies and entertainment. A thematic analysis was performed with the help of MAXQDA 24 software. The results revealed the challenges Ukrainian students confront: environmental instability (war, power cuts), performance anxiety, emotional depletion. The role conflict within work-study-life led to high levels of stress. The participants struggled with managing time, felt exhausted and burnt out. Among the effective strategies that can help Ukrainian university students to balance work, study, and life roles, the following ideas were mentioned: setting clear boundaries between work, education, and free time, taking rest, avoiding multitasking. Ukrainian

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students expected changes at the system level, such as remote options for education and flexibility. The findings of the study can provide a framework for further empirical research and open interdisciplinary dialogue between psychological and pedagogical fields. Balanced roles of work, study, and life may improve students' academic performance and overall quality of life and well-being

Keywords: inter-role conflict; educational institutions; challenges; work-study-life harmony; strategies

Introduction

The topic of role balance among Ukrainian university students during the time of war is highly relevant as Ukrainian students are required to simultaneously navigate multiple demanding spheres, including academic engagement, employment, family responsibilities, displacement or migration, and, in some cases, civic or volunteer involvement. War-related stressors such as uncertainty, trauma exposure, financial instability, and interrupted learning environments significantly affect students' ability to maintain a balanced distribution of roles. Understanding role balance in this context is essential, as imbalances may lead to emotional exhaustion, decreased academic performance, and compromised mental well-being, while adaptive role integration can serve as a protective factor fostering resilience and continuity of identity.

According to the statistics provided by the Ministry of Education and Science of Ukraine (n.d.), 4,456 educational institutions have suffered bombing since February 2022; 408 have been destroyed. N. Malysh *et al.* (2025) point out that a lot of students have been forced to relocate abroad to survive. Another research findings by Y. Stadnyi (2025) introduce the latest available data of approximately 115,000 students who migrated abroad in the 2023-2024 academic year. Those people who stayed in Ukraine suffer from the bombing. In addition to everyday life threats, people must cope with the hardships of power cuts and blackouts. Pursuing education in such conditions is a huge challenge. In addition to macro adversities, students must confront diverse issues at meso- and micro- levels. Many Ukrainian students must manage the studies and employment. Some students have additional responsibilities of taking care of the parents or spouses and children. O. Boyko *et al.* (2024) and K. Pallay *et al.* (2024) reported that since the beginning of the Russian-Ukrainian war, a lot of people have started volunteering, which adds responsibility and strain. Balancing all these roles and duties presents an enormous problem for students, affecting mental health and well-being.

This research investigates various challenges faced by Ukrainian university students who are trying to meet the demands of education, work, and personal life. It also studies the effective ways used to cope and overcome obstacles. Working students often experience symptoms of emotional exhaustion and burnout. The clashing requirements from employment and education in wartime can cause excessive anxiety and distress, affecting students' academic performance and personal life. This study was framed by a foundational inter-role conflict theory, which focuses on the challenges that can often arise from competing interests of different fields. As explained by Z. Bello & G. Tanko (2020), the theory suggests that competing interests create role conflict, affecting the individual in both fields. Inter-role conflict is defined as follows: "the form of role conflict that occurs when individuals have multiple roles and the expectations and behaviours associated with one role are not consistent with the expectations and behaviours associated with another" (APA dictionary of psychology, n.d.). Despite the breadth of the described problem, research on inter-role conflict, work-study and personal life balance in wartime

is scarce. The latest studies done by M. Korda *et al*. (2025), M. Polyvianaia *et al*. (2025), and T. Yamchuk (2025) point out students' stress, anxiety, and resilience. The challenges that students in Ukraine in the time of war confront while balancing the work, education, and personal lives have been less explored.

Consequently, the objective of this study was to fill the existing research gap and delve into the experiences of Ukrainian university students. This study aimed to find out the challenges of balancing various roles within education, employment, and personal life in wartime among Ukrainian university students, to present the results of the survey, and to suggest strategies for improvements.

Literature Review

The literature review has been performed in two stages to ensure a theoretical support for this mixed methods research. First, the theoretical base for the notion of work-study-life balance (WSLB) is set by examining inter-role conflict theory. Second, the focus is narrowed to the challenges specific to the university student population who balance study, employment, and free time activities. Work-life balance is defined in the works of C. Kirchmeyer (2000) as the achievement of fulfilling experiences in the different aspects of life that require various resources, like energy, time, and commitment and these resources are spread across all the domains. Z. Bello & G. Tanko (2020) reviewed theories that exist to explain work-life balance. The authors include segmentation theory, spill-over theory, compensation theory, instrumental theory, and inter-role conflict theory. WSLB, according to authors M. O'Mahony & D. Jeske (2019) could be defined as a balance of conjoining three "categories of student commitment" – the work obligations, demands of the studies, and the private life.

Extensive research shows that balancing academic responsibilities with employment commitments impacts students' overall well-being, life quality, and satisfaction during the education. Most university students believe that work and academic overload can cause stress and burnout. The greater number of demands, as stated by the authors K. Szegedi *et al*. (2024), means that students do not have time for hobbies or pay less attention to the families. The authors J. Sprung & A. Rogers (2021) put an emphasis on work-life balance as a predictor of college student anxiety and even depression. The role conflict between education and employment can be a source of stress, absenteeism, and even turnover, which was mentioned by J. Lenaghan & K. Sengupta (2007). The study explores the psychological impact of balancing full-time education with employment. It is particularly relevant given the rising costs of tuition, which necessitate that many students work to continue education. The authors develop a model based on two competing theories of multiple-role engagement. The depletion argument posits that individuals have limited time and energy resources. Engaging in multiple roles (student and worker) creates "compounded adversity" where demands in one area deplete the energy needed for another, leading to strain and reduced well-being. The enrichment argument takes a positive view, suggesting that multiple roles can be gratifying and energy-expanding. It argues that benefits like increased status and self-esteem can improve students' overall mental health. The article concludes that while the "depletion" of time is a real concern for administrators, the quality of a student's emotional engagement is a better predictor of success. By fostering "role-ease" and positive reinforcement, universities can help working students thrive rather than just survive.

The Ukrainian researchers N. Tsybuliak *et al*. (2023) investigated challenges of functioning of the education system in Ukraine in conditions of the war. The researchers point out that forced migration caused a massive loss of students and faculty. The study also highlighted a hard reality of life under occupation, which impacted the ability of students to attend or engage in studies. The study by O. Polovko & S. Glotov (2023) explored the experiences of Ukrainian students

at the Taras Shevchenko National University of Kyiv to understand the impact on the educational process. The invasion shifted classes online, but attendance and learning were disturbed by frequent power cuts and air raids. T. Marchenko (2023), M. Błaszczyk *et al.* (2025), in the research, point out that blackouts disrupt teaching and learning processes; frequent air raid alerts interrupt classes and examinations. The authors introduce the concept of "compounded adversity," noting that war does not replace typical academic stressors, like performance anxiety and financial pressure, but intensifies these stressors. The findings reveal that students rely on everyday coping strategies, such as collaborative study chats and adaptive time management. A key contribution of this research is the concept of "shared resilience". The study demonstrates that while institutional adaptations like hybrid learning and flexible deadlines provide a necessary structure, the actual survival of the educational process depends on a dynamic interplay where students and faculty proactively fill implementation gaps.

Other studies examine the psychological well-being and academic performance of Ukrainian students in safer regions of the country during the Russian-Ukrainian war (Korda *et al.*, 2025; Polyvianaia *et al.*, 2025). The authors link high levels of Post-Traumatic Stress Disorder symptoms, depression, stress, and anxiety to academic performance. These mental health challenges and emotional burdens of war affect students' roles within work-study-life. The adversities that the educational system in Ukraine has been fighting against for almost four years of the full-scale war have been widely documented. The role conflicts of university students and the balance have been studied abroad, e.g., in the US by J. Lenaghan & K. Sengupta (2007). In the UK, S. Cronshaw *et al.* (2024) researched gendered roles of working student mothers. In Israel, L. Kulik (2025) studied role conflict, sense of balance, and well-being among working students who are parents. However, there is a scarcity in mixed methods research that identifies the role conflicts of Ukrainian university students. Therefore, the presented study aims to fill this gap.

Materials and Methods

Research design. This study employed a mixed methods design. Participants. N = 80 university students (convenience sampling) from National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Taras Shevchenko National University of Kyiv, and Kyiv National Economic University named after Vadym Hetman. The study was conducted from October to December 2025. The research involved a mixed-methods survey to explore the roles, challenges, and strategies of university students. 80 university students aged 17-41 (M = 20.49), 75 females and 5 males, completed a survey in Google Forms. 10 students were married, 8 of these students had children.

Instruments. A Google Form containing 15 questions was designed to collect both quantitative and qualitative data. Quantitative Data Questions provide numerical data: categorical/ordinal scales measure workload (study and work hours), such as how many hours respondents spend on academic work and part-time work per week. Attitudinal & evaluative scales: use rating (Likert-type) to measure satisfaction, balance, stress, for example, "Rate your current work-life balance on a scale from 1 – unbalanced to 5 well-balanced". "Rate your stress level related to balancing work and study on a scale of 1-5, where 1 means low and 5 means excessive". Such scales also include questions about prioritisation: "Which of the following do you prioritise: academic work, part-time job, social life, personal time?". Qualitative Data Questions provide textual data suitable for thematic analysis: open-ended, for example: "What challenges do you face in balancing personal life with study and work?", "What improvements could you suggest for better work-study-life balance?".

Survey data collected via Google Forms were automatically exported to Google Sheets, where quantitative analysis was conducted using built-in

spreadsheet functions. Descriptive statistics, including frequencies, percentages, and mean values, were calculated to summarise the survey results. Given the exploratory nature of the study and the focus on descriptive statistics, Google Sheets was considered sufficient for the purposes of quantitative analysis. Thematic analysis was applied to the open-ended responses. Thematic analysis of the students' responses was performed with the help of MAXQDA 24 software, following V. Braun & V. Clarke's (2006) six-step approach. Step 1: become familiar with the data. Step 2: generate initial codes. Step 3: search for themes. Step 4: review themes. Step 5: define themes. Step 6: write-up.

Ethical considerations. The study was conducted in conformity with ethical standards of the American Sociological Association's Code of Ethics (2018). Participation was voluntary, and no coercion or material incentives were used. Prior to participation, all respondents were informed about the purpose of the study, its procedures, potential risks and benefits, as well as the right to withdraw at any stage without any negative consequences. Anonymity and confidentiality of the collected data were ensured. No personally identifiable information was collected, and the results were used exclusively for scientific purposes. The data were stored in a secure format and were not shared with third parties. Given the potentially sensitive social context related to the combination of work, study, and stress-related factors, the wording of the survey questions was designed to minimise psychological discomfort and avoid re-traumatisation of participants. The study did not involve any interventions that could cause harm to the psychological or physical well-being of the respondents.

Results and Discussion

The results show that 43.8% of Ukrainian students spend 10-15 hours a week on academic work outside the class timings, and 26.2% spend even more than 15 hours, which means a high load (Fig. 1).

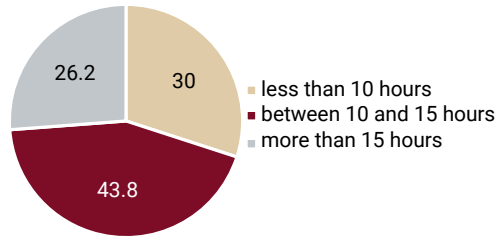

Figure 1. *Academic load of Ukrainian students*
Source: *created by the authors based on data from the surveys in Google Forms*

62.5% of surveyed students prioritise academic work, 37.5% prioritise part-time job. 32.5% of Ukrainian participants spend up to 10 hours a week working; 36.3% of Ukrainians spend up to 15 hours or more at work being students, which are quite high percentages. Consequently, it is not surprising that 57.5% of Ukrainian respondents do not have enough time for hobbies and entertainment. The average rating for work-study-life balance on the Likert scale, where 1 is unbalanced, and 5 is well-balanced, for Ukrainian stu-

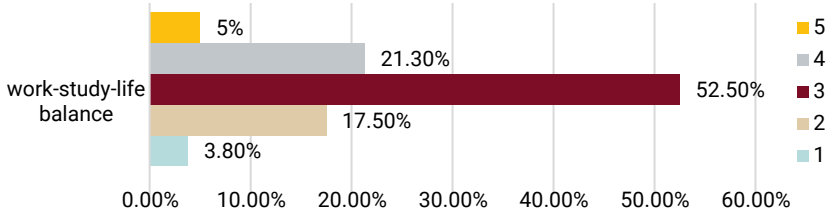

Figure 2. *Students' current work-study-life balance on a scale*
Note: *1– unbalanced; 5 – well-balanced*
Source: *created by the authors based on data from the surveys in Google Forms*

dents is 3.06 (Fig. 2).

As a result, the average rating of a stress level related to balancing work and study on the Likert scale (where 1 means low and 5 stands for excessive) is 3.35. To manage stress, Ukrainian students prefer either family support or self-therapy. Only 10 out of 80 Ukrainians who took part in the survey use counselling services, which means that psychological help is still stigmatised. 98.7% of Ukrainian students, as the data obtained from the Google Forms show, feel overwhelmed by the responsibilities. The average rating of satisfaction with the current time management skills on the Likert scale (where 1 stands for low and 5 means total level of satisfaction) for respondents is 2.95. Some activities students engage in to relax when students find free time from the work and study are socialising, reading, and sports. Only 38.8% of Ukrainian students who took part in the research, answering questions in Google forms, think that the universities provide adequate resources for work-study-life balance, which should give food for thought for administration and stakeholders of the educational institutions. The responses to open-ended questions: "What challenges do you face in balancing personal life with study and work?" and "What improvements could you suggest for better work-study-life balance?" provided textual data suitable for thematic analysis. The data underwent the analyses with the help of MAXQDA 24 software. Table 1 below shows the challenges Ukrainian students face in balancing

Table 1. *Challenges Ukrainian students face in balancing roles of work, study, and personal life*

Themes	Codes	Quotes
Inter-role conflict (time-based)	Mutual incompatibility	"I study and work, so I don't always have the opportunity to attend classes and submit assignments on time"
	Sacrifice	"You constantly have to sacrifice one thing or the other to be able to be present everywhere… personal life ends up on pause"
	Time deficit	"I need extra hours a day… not enough time to focus on long-term academic tasks when I'm trying to do hobbies"
Inter-role conflict (strain-based)	Cognitive overflow	"Troubles with concentration on one without thinking about the other"
	Emotional depletion	"After a long day you feel emotionally drained, so you can seem distanced to your partner… they think you don't put enough effort"
	Resource exhaustion	"Intensive studying consumes most of my energy. Even when I have some time left, I often lack the strength to truly enjoy my personal life"
Inter-role conflict (behavioural)	Conflicting responsibilities	"My roles as a student and a wife sometimes conflict with each other, making it difficult to maintain inner balance"
	Domestic vs. academic	"After a long day of studying you have to go home, do your homework, make dinner, do other chores etc."
External stressors	War	"The war in our country also significantly affects the level of difficulty… an unstable emotional state"
	Schedule	"Studying in the second shift takes up the whole day, there is not enough time for work in the morning"
Psychological impact	Stress	"Constant sense of overload… feelings of guilt for not managing to do everything"
	Performance anxiety	"Trying to do everything perfectly often leads to exhaustion… due to perfectionism, I spend a lot of time on tasks"

Source: *created by the authors*

the roles of personal life with study and work.

In addition to above-mentioned challenges, married students and those who are in relationships highlight the clash of the roles: "Considering I have a family, children, a dog, constant work, and war, this is very difficult for me". "Sometimes deadlines, exams, or work tasks take up so much attention that there's little energy left for rest or hobbies. It can also be difficult to maintain social relationships when you're constantly busy". "Com-

bining academic responsibilities with personal needs leads to emotional fatigue and feelings of guilt for not managing to do everything. Moreover, my roles as a student and a wife sometimes conflict with each other, making it difficult to maintain inner balance and stability". The improvements that Ukrainian students suggested for balancing the roles and responsibilities are introduced in Table 2.

Table 2. *Students' recommendations for better work-study-life balance*

Themes	Codes	Quotes
Boundary management	Strict division	"Set strict boundaries between work, studies, personal life"
	Digital disconnection	"Do not bring work home… disconnect after work… get rid of phone addiction/reduce time on social media"
	Role protection	"Set clear boundaries between study time and personal time… to protect your rest, relationships, and well-being"
Cognitive & behavioural strategies	Prioritisation (anti-perfectionism)	"Identify what truly needs to be done first and what can wait… don't try to be perfect in everything."
	Multitasking vs. focus	"Avoid multitasking… improve deep focused work"
	Planning	"Keep a diary and listen to yourself…write a schedule for everyday"
Energy & resource recovery	Time off	"Schedule personal time like an appointment… take regular breaks to avoid burnout"
	Physiological essentials	"Establish a sleep schedule… find a hobby for the soul… prioritise rest, especially in conditions of increased stress because of war"
Structural & institutional changes	Flexibility	"Negotiate flexibility (remote days, flexible hours) … more flexible schedules and realistic deadlines"
	Curriculum optimisation	"Better university curriculum, less written assignments and more practical assignments… recordings of lectures"
Support & communication	Relationship harmony	"Open communication with my partner… better planning makes it easier to maintain stability and harmony"
	External support	"Find additional sources of support… have financial savings to feel more secure"

Source: *created by the authors*

The respondents' recommendations suggest that role balance is not a static state but an active negotiation of boundaries. Many students recommend lowering the "perfectionist" bar. "By choosing which tasks to perform well, energy remains for health, sleep, and relationships". A repetitive sub-theme is the "war context". Balance for these students is not just about work and study. It is about maintaining mental stability under chronic environmental stress. Such pieces of advice as "finding a hobby for the soul" and "prioritising mental recovery" are seen as essential survival instruments.

The results received from the conducted survey support the inter-role conflict theory, that formed the basis for this research. The theory states that the pressures and demands from one life role (e.g., student) make it difficult or impossible to meet the demands of another life role (e.g., friend, parent, employee). The roles are seen as mutually exclusive, as stressed by Z. Bello & G. Tanko (2020), with success in one requiring a sacrifice in the other, and the time required for one role interferes with the time available for the other. The stress, fatigue, or tension generated in one role make a person too exhausted or irritable to perform well in the other role. The basic principles of this theory were observed in the results of the survey: the students reported high stress levels, feeling overwhelmed by the responsibilities. In addition, the thematic analysis of the challenges mentioned by the participants demonstrated the following: students struggle with managing time and maintaining a balance; respondents report exhaustion and a lack of personal time;

boundaries between study and life are unclear. The war context plays a "background role" that exhausts emotional resources and makes work-study-life balance even more unstable. The frequently mentioned feeling of guilt for failing in some roles causes a decrease in students' motivation. These results support the findings of the earlier study reporting that the students' struggles with motivation, time management, and performance anxiety – common in higher education – were intensified by air raid alerts, power outages, and psychological strain (Błaszczyk *et al.*, 2025).

There is a clash of the roles. The surveyed Ukrainian students frequently cited a triangular conflict between work, study, and domestic or relationship roles (e.g., being a wife, mother, or partner). The most conflicting role, which was proved by the research done earlier, is the role of mother (Cronshaw *et al.*, 2024). Work and study overload, anxiety, conflicting "mothering" responsibilities, feelings of guilt reported in that study were also observed in the responses of the participants. The present study not only proved the theory described above, but also supported earlier research on work-study-life balance. Some studies suggest that students who work up to fifteen hours per week benefit from this, but that working longer hours can have a harmful impact on students' well-being and performance (Curtis & Lucas, 2001).

Educational institutions play a vital role in creating a favourable environment for students. By offering flexible scheduling, mental health resources, and workshops on time management, universities can assist students in achieving a more balanced lifestyle. The recommendations communicated by the Ukrainian students as desirable actions for better work-study-life balance resonate with the key messages of the previous studies: using flexible scheduling, enabling online and distance learning, considering working students' WSLB as a root of the emotional state (Martinez *et al.*, 2013; Lowe & Gayle, 2016; Vokić *et al.*, 2021). Some Ukrainian educational institutions have already taken measures to adapt to wartime. Many universities have established psychological support hotlines where students can receive consultations from qualified specialists (Yamchuk, 2025).

However, it can be assumed that not all universities have taken such measures or these measures are not enough, because the participants of this research repeatedly point out these issues, and less than 40% of respondents think that the universities provide adequate resources to help balance work-study-life roles. Taking measures at micro (personal) and meso (institutional) levels is much easier than confronting challenges at the macro level (threat, danger, and destruction of the war).

Conclusions

The results of the research support inter-role conflict theory, the theoretical basis of work-study-life balance. The survey results show that academic work is a high priority for Ukrainian students. A substantial percentage of Ukrainian students also dedicate 10-15 hours or more per week to part-time jobs. Due to these demands, most Ukrainian students report a lack of time for hobbies and entertainment. The research identified the number of challenges Ukrainian university students face while balancing academic responsibilities, employment, and personal life in wartime. These challenges encompass environmental instability (war, power cuts), performance anxiety, and emotional depletion. The role conflict within work-study-life leads to high levels of stress and an overwhelming feeling of responsibility for nearly all surveyed students. To cope with stress, Ukrainian students turn to family support or self-therapy; only a few choose professional counselling services. The participants struggle with managing time, feel exhausted and burnt out, especially those who are married and have children.

Among the effective strategies that can help Ukrainian university students to balance work, study and life roles, the following ideas were mentioned: setting clear boundaries between work, education, and free time, taking rest, and avoiding

multitasking. Resilience is paramount as well. Moreover, Ukrainian students expect changes at the system level, such as flexible remote options for education. Although this research advances the literature on balancing roles within education, employment, and personal life in wartime, limitations of the study must also be acknowledged. First, it is based on a relatively small sample, and the findings cannot be generalised. There is also an unequal distribution of female versus male participants. The participants were the students from Kyiv universities only. Consequently, the obtained findings should be viewed as preliminary. To generalise the results of this research, further studies are recommended involving larger and more diverse samples from various regions of Ukraine. The findings can provide a framework for further empirical research and open interdisciplinary dialogue between psychological and educational fields. Balanced roles of work, study, and life may improve students' academic performance and overall quality of life.

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Conflict of Interest

None.

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Анотація. Поєднання навчання, роботи та особистого життя є однією з ключових проблем для студентів закладів вищої освіти. Метою цього дослідження було отримання відповідей на наукові запитання щодо викликів, з якими стикалися українські студенти університетів у процесі поєднання освітніх, професійних та особистих ролей в умовах воєнного стану, а також визначення стратегій, що можуть сприяти досягненню балансу між роботою, навчанням і особистим життям. Результати досліджень засвідчили, що конфлікт ролей і вимог призвів до емоційного виснаження, стресу та тривожності. Теоретичною основою дослідження стала теорія міжрольового конфлікту, а отримані результати підтвердили її ключові положення: конкуруючі інтереси різних сфер сформували рольовий конфлікт, який впливав на особистість у всіх вимірах життєдіяльності. У дослідженні було застосовано дизайн змішаних методів. Анкетне опитування проведено серед 80 українських студентів закладів вищої освіти. З них 62,5 % респондентів надали пріоритет навчанню, тоді як 37,5 % – роботі з неповною зайнятістю. Встановлено, що 57,5 % опитаних не мають достатньо часу для хобі та відпочинку. Тематичний аналіз здійснено за допомогою програмного забезпечення MAXQDA 24. Результати засвідчили основні виклики, з якими стикалися українські студенти: нестабільність середовища (війна, відключення електроенергії), тривожність щодо результатів діяльності та емоційне виснаження. Міжрольовий конфлікт у системі «робота – навчання – особисте життя» зумовив високий рівень стресу. Учасники дослідження відчували труднощі з управлінням часом, втому та емоційне вигорання. Серед ефективних стратегій досягнення балансу між роботою, навчанням і особистим життям респонденти відзначили встановлення чітких меж між професійною діяльністю, освітнім процесом і вільним часом, повноцінний відпочинок та уникнення багатозадачності. Українські студенти також очікували змін на системному рівні, зокрема розширення можливостей дистанційного навчання та підвищення гнучкості освітнього процесу. Отримані результати можуть слугувати основою для подальших емпіричних досліджень і розвитку міждисциплінарного діалогу між психологічною та педагогічною науками. Збалансоване поєднання ролей роботи, навчання та особистого життя сприятиме підвищенню академічної успішності студентів і загальної якості життя та благополуччя

Ключові слова: міжрольовий конфлікт; заклади освіти; виклики; гармонія між роботою, навчанням та особистим життям; стратегії

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Psychological resources of professional growth among lecturers in socionomic specialties in the context of the development of their subjectivity

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Abstract. The article addressed the important issue of how lecturers develop their professional position. Professional growth in these specialties occurs under conditions of high emotional strain and intensive interpersonal interaction. This increases the demands placed on self-regulation and responsibility for the psychological climate of the educational environment. This intensifies the risk of chronic stress and burnout, thereby reducing teaching quality and professional resilience. However, the transformation of psychological resources into professional growth and the role of lecturer subjectivity in this process remain insufficiently clarified. This study aimed to identify the psychological resources that facilitate professional development among lecturers in socionomic disciplines and to develop a model for their implementation within the context of subjectivity development. The study showed that emotional factors and socio-emotional competencies form the basis of psychological stability in interactions, while resilience and self-efficacy sustain endurance, recovery and professional motivation. Psychological capital and mindfulness enhance positive self-regulation and reduce reactivity. The study established that the primary mechanism through which resources are transformed into professional growth is lecturer subjectivity, realised through the proactive organisation of professional activity, maintenance of professional identity and engagement, and satisfaction of basic psychological needs. The quality of the lecturer-student relationship is emphasised as a specific socionomic resource that modifies the effectiveness of psychological resources through trust and emotional safety. It has been observed that lecturers' psychological resources constitute an integrated system, with subjectivity serving as the primary mechanism for professional development by combining resilience, proactivity, and the creation of meaning within the professional role. Practical approaches that develop subjectivity and self-regulation have the potential to enhance well-being, reduce burnout risk, and improve the

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quality of the educational environment. The results obtained may contribute to the development of effective programmes for teachers' professional development

Keywords: education; well-being; burnout; self-efficacy; psychological capital

Introduction

This study is relevant because there is a need to develop and strengthen lecturers' professional qualities and stance. The educational process is increasingly operating under conditions of heightened psychological and social workload, contributing to rising stress levels and highlighting the issue of maintaining lecturers' professional stability. This also requires identifying the key factors that facilitate these processes. In recent years, the psychological resources that underpin the professional growth of lecturers in sociological specialties have become particularly significant in light of the heightened emotional intensity of pedagogical interaction, the high demands placed on communicative competence and the need for continuous self-regulation. Within contemporary models of future teachers' well-being, resources are increasingly described as a structured system of emotional and regulatory factors that determine psychological resilience and the capacity for professional development, rather than as a "set of traits". This confirms that the quality of professional development depends on how individuals experience, understand and manage emotional responses in educational and professional situations. This is particularly important for lecturers in socionomic specialties, as their work is human-centred and requires not only the transmission of knowledge, but also supporting students' subjectivity. Consequently, lecturers must adopt a subjective position as the authors of their professional actions, meanings, and boundaries.

The post-pandemic context and the war have exacerbated the importance of resourcefulness as a safeguard against the negative effects of stress. Ukrainian researchers O. Lokhvis (2022) and N. Yaremchuk *et al.* (2024) have observed that the professional identity of lecturers is formed through the interplay of personal attributes and the circumstances of the educational setting, particularly stress. I. Cho *et al.* (2021) demonstrated that, among teachers, resilience may perform a mediating role in the relationship between stress or anxiety and depressive manifestations and subjective well-being, whereas self-efficacy does not always function as such a "bridge" between tension and psychological state. This means that the focus moves on from general statements about the importance of "self-confidence" to a more specific question: which resources actually work as mechanisms of psychological recovery and when do they work. Nevertheless, self-efficacy combined with job satisfaction remains a significant psychological predictor of teachers' well-being, confirming its importance as a factor in professional stability and motivational support. While self-efficacy is important for well-being, its role in stress-related processes may not be universal, requiring further clarification of theoretical models and contexts. J. Nwoko *et al.* (2023) demonstrated that lecturers' professional well-being is determined by the interaction of individual psychological characteristics, working conditions, the quality of professional relationships, and the availability of support. M. Sohail *et al.* (2023) found that burnout and a decline in well-being are associated with chronic job demands, emotional labour, and a lack of support. Resources, on the other hand, include autonomy, professional development, and high-quality relationships within the organisation.

Contemporary academic literature emphasises that teachers' well-being is a multi-level construct shaped by personal, interpersonal and organisational factors. Professional well-being is influenced by individual resources (particularly

those related to self-regulation and competence), the nature of the working environment, and the quality of professional relationships. R. Gilar-Corbi *et al.* (2025) demonstrated through structural modelling that emotional factors form integrated pathways influencing well-being indicators in future teachers. J. de Carvalho *et al.* (2021) and M. Sohail *et al.* (2023), in their studies of well-being and burnout, also show that high job demands, emotional overload, lack of support, and organisational dysfunctions are leading predictors of risk, whereas support, autonomy, and opportunities for development are leading predictors of resilience. Accordingly, preventing exhaustion is increasingly seen as requiring a combination of individual and systemic interventions. Reviews of interventions aimed at reducing stress and burnout among teachers highlight the effectiveness of programmes focusing on self-regulation skills, well-being support, and developing psychological resources. However, they also point to the heterogeneity of designs, tools, and outcomes. This is particularly important for lecturers in socionomic specialties, as their professional reality often involves intensive interaction, high moral responsibility, and role-based multitasking. Consequently, models of resourcefulness are required that explain not only the reduction of symptoms, but also professional growth as a transition towards a more mature subjective position. This study aimed to determine the psychological resources that support the professional growth of lecturers in socionomic specialties within the context of developing their subjectivity.

Materials and Methods

A systematic study was carried out, involving the analysis, synthesis and generalisation of the obtained data. To ensure the relevance of the presented data and reflect the latest trends and challenges, particularly those associated with global transformations in education and the psychological resources of lecturers' professional development, the research included a comparative analysis of contemporary scientific publications in Ukrainian and English from the past five years (2021-2025). The analysed sources included scientific articles published in peer-reviewed journals that are indexed in the Scopus, PubMed, Web of Science, PsycINFO and Google Scholar databases, as well as monographs, dissertations and dissertation abstracts. The following keywords were used for the search: education, well-being, burnout, self-efficacy and psychological capital. In the first stage, contemporary scientific literature by Ukrainian and international scholars was analysed, the research objective was formulated, and the research tools, methods, and scope were defined. During the second stage, data collection was carried out.

Data for the study were obtained from various sources. After identifying duplicate articles, the titles and abstracts were screened, resulting in the exclusion of some articles. A full-text analysis was then conducted, resulting in the selection of 21 publications for the final review that fully met the inclusion criteria and addressed the study's topic. These articles formed the research base. In the final stage, the collected data were analysed, the results summarised and the conclusions formulated. The data were analysed using a qualitative approach. This involved identifying themes and patterns in the data, as well as analysing information relevant to the research questions and objectives. The analysis also involved comparing the data with existing literature on the research topic, identifying the main characteristics of professional growth among lecturers in socionomic specialties, and determining the psychological resources involved in this growth within the context of the development of subjectivity.

The article's research methodology was based on the theoretical analysis and systematisation of scientific literature concerning the identification of psychological resources for professional growth among lecturers in socionomic specialties, as well as ways to implement these resources in the context of developing subjectivity. The following scientific methods were employed

to achieve the research objective: analysis and synthesis; comparative analysis; systematisation; and generalisation of data. Analysis and synthesis were used to summarise data from domestic and international scientific sources concerning lecturers' professional competence and psychological well-being in the context of contemporary educational challenges and stress. The data obtained were classified according to the following themes: teachers' competence levels, psycho-emotional workload, emotional factors, teachers' personal resources, the educational environment, educational interventions and support, psychological well-being, and the effectiveness of professional development. This made it possible to identify key trends, problems and effective practices.

Comparative analysis was used to identify common and distinctive features in the challenges and approaches to organising the educational process and the role of teachers, as well as to compare the needs and resources of lecturers in socionomic disciplines. Systematisation was applied to structure the data, highlighting the main psychological and pedagogical aspects of teaching and classifying the challenges faced by lecturers of the new generation. This also allowed for summarising existing methodological models of competence development and identify psychological factors contributing to the professional growth of lecturers in socionomic specialties.

Results and Discussion

The professional development of lecturers specialising in sociology under contemporary conditions should not be considered as a linear accumulation of experience, but rather as a dynamic process supported by a system of psychological resources and mechanisms for self-regulation, interaction and the proactive transformation of professional activity. In this context, the key integrative concept is the lecturer's subjectivity, which is defined as the capacity to act with authorship, self-determination and responsibility for meanings, boundaries and the quality of relationships within professional interactions. Subjectivity determines whether a resource is transformed into an actual strategy for professional growth or remains merely potential that remains unactivated under stress. Notably, contemporary scientific approaches increasingly attribute teachers' well-being and effectiveness to interconnected emotional, motivational, and behavioural factors rather than to isolated characteristics.

The psychological well-being of future educators is systemic and determined by the interaction of emotional factors. If well-being possesses a structural basis, then the professional growth of a lecturer can be understood as the development of the ability to manage one's emotional states, meanings and reactions in complex social situations. In sociocultural specialties, "emotional labour" is the norm: lecturers support the learning process, maintain the group's psychological climate, respond to students' complex social requests, and meet institutional demands. Consequently, resourcefulness in this sphere does not mean an "absence of negative emotions", but rather the capacity to integrate emotional experience into professional decisions and behaviour without losing effectiveness or humanity (Wang & Wang, 2022; Kim *et al.*, 2023; Gilar-Corbi *et al.*, 2025).

Under conditions of increased stress, resilience can help to overcome stress, anxiety and depressive symptoms. According to I. Cho *et al.* (2021), resilience acts as a protective mechanism that can transform stress. At high levels of resilience, stress and anxiety do not necessarily lead to depressive symptoms or a decline in well-being. This is directly related to subjectivity, since a subjective position presupposes the ability to tolerate uncertainty, maintain internal self-regulation and act responsibly, even when under emotional pressure. Among lecturers in sociological disciplines, resilience may manifest as the capacity to recover from emotionally challenging interactions without reducing professional activity or shifting towards defensive emotional detachment, which often results in formalised pedagogical behaviour. At the same

time, resourcefulness cannot be reduced solely to resilience. Self-efficacy and job satisfaction are associated with teachers' well-being, so self-efficacy is a significant psychological resource for professional stability. While self-efficacy does not always act as a mediator in stress-related models, it remains a vital part of the motivational and activity-related sphere. It fosters a sense of control over outcomes and a belief in one's ability to influence the educational process. For lecturers in sociological specialties, self-efficacy is particularly valuable because the outcomes of their work are often difficult to measure quickly; for example, changes in students' competence, professional identity formation, and learners' subjectivity development occur over time. In these circumstances, self-efficacy helps to maintain the intensity of effort and the internal coherence of professional activity, preventing the pedagogical process from becoming a mere "survival from one class to the next" (Ciuhan *et al.*, 2022; Wang & Wang, 2022).

However, individual resources only acquire meaning within a broader system of determinants of professional well-being, shaped by the interaction of individual psychological characteristics, working conditions, professional relationships and support. J. Nwoko *et al.* (2023) note that even a high level of individual resourcefulness may be unrealised if the environment systematically reinforces feelings of helplessness, for example through a lack of autonomy, constant contradictory demands, low levels of support or toxic communication. Conversely, M. Sohail *et al.* (2023) argue that organisational conditions may act as a catalyst for the development of subjectivity when they create space for self-determination, reflection, and professional initiatives. Lecturers' well-being and risk of burnout are influenced by chronic work demands, emotional labour, organisational stressors, and a lack of support. At the same time, resources include autonomy, opportunities for development, and high-quality relationships within educational institutions. For lecturers in sociological specialties, emotional labour is particularly significant: constant emotional attunement to students, the need to maintain empathy while preserving professional boundaries, creates a risk of exhaustion even among highly competent specialists. In such circumstances, subjectivity manifests as the ability to actively shape a psychologically healthy style of interaction, define boundaries, structure contact, regulate engagement intensity, and maintain personal recovery, not merely endure. Autonomy and opportunities for development are important resources that enable lecturers to preserve a sense of authorship in their professional activity (Gracia *et al.*, 2021; Gilar-Corbi *et al.*, 2025).

Although interventions aimed at reducing stress and burnout among teachers have demonstrated promising results, the evidence base is characterised by heterogeneity in research designs and evaluation methods. This complicates the generalisation and transfer of conclusions to different professional groups. If interventions are assessed using different indicators without taking contextual factors into account, it becomes difficult to determine which mechanisms work for specific groups, such as lecturers in sociocultural specialties where communication and emotional demands predominate. Therefore, the justification of psychological resources for professional growth requires more than a list of "useful practices"; it also requires an explanation of how these practices influence the key psychological mechanisms of subjectivity, such as self-determination, reflective choice-making, proactivity and resilience in interaction (Agyapong *et al.*, 2023; Villalta-Paucar *et al.*, 2025). In this context, emotional intelligence occupies a special place as a meta-resource. Researchers Y. Wang & Y. Wang (2022) and Y. Lin *et al.* (2022) have demonstrated that emotional intelligence and self-efficacy are associated with reduced teacher burnout and can therefore be considered psychological predictors of resilience and effective emotional regulation. Emotional intelligence does not merely "improve communication"; it enhances lecturers' ability to manage their own

emotional states during interactions, forming the foundation of subjectivity. Without the regulation of emotional reactions, subjectivity is impossible, as impulsivity or chronic suppression of emotions reduces the quality of professional decision-making. In socionomic specialties, emotional intelligence is a particularly important tool for maintaining empathy without becoming overwhelmed by the problems of others, enabling the lecturer to perceive the emotional dynamics of a group without becoming its hostage.

Contemporary research clarifies that the key resources of resilience and growth include emotional competencies and systems derived from positive psychology and mindfulness. Psychological capital is significantly associated with teacher burnout, and mindfulness may be an important mechanism within this system that explains part of the relationship between resources and negative states. This conclusion is important for professional growth because psychological capital (hope, optimism, resilience and self-efficacy) can be seen as the "core" of internal developmental energy, while mindfulness can stabilise and regulate this energy. For lecturers in sociological disciplines, mindfulness can enhance the ability to stay present during intricate interactions, recognise one's reactions, and prevent automatic responses (e.g. avoiding defensive sarcasm, excessive control, or emotional distancing). This is directly related to the subject position: subjectivity presupposes the conscious choice of behaviour rather than reactivity. These mechanisms become clearer when burnout is analysed not just as a "sum of symptoms", but as an interconnected system of manifestations. The structure of burnout symptoms can be described as a network of symptoms associated with psychological capital. The practical significance of this approach is that resources can influence key "nodes" of symptomatology – those components that trigger or sustain other manifestations, such as chronic fatigue, cynicism, or a diminished sense of accomplishment. D. Xue *et al.* (2023) found that, among lecturers in socionomic disciplines, emotional exhaustion resulting from continuous interaction often acts as such a node. Psychological capital and mindfulness reduce the intensity of this node, thereby indirectly stabilising the entire system of psychological functioning.

Resilience and subjectivity describe a person's ability to actively maintain adaptation and development under complex conditions. S. Zhang & Y. Luo (2023) note that resilience can be both a personal characteristic of the lecturer and the result of professional practices, such as reflective analysis of boundaries, constructing supportive relationships, forming realistic expectations and adjusting professional strategies. For lecturers in socionomic specialties, professional growth should therefore encompass psychological skills and behavioural recovery practices that stabilise stress reactivity and support the ability to engage in complex interactions (Jiang & Yuan, 2025). R. Gilar-Corbi *et al.* (2025) emphasise that the psychological well-being of future educators is shaped by a structured system of emotional factors, with emotional components determining the main trajectories of psychological adaptation and stability. Emotional factors are therefore particularly valuable for understanding professional development, rather than relying solely on academic or cognitive competencies (Rubio-Valdivia *et al.*, 2024). Y. Jiang & Q. Yuan (2025) observe that job satisfaction may impact burnout via psychological capital, and that physical activity can modify the strength of this relationship. This highlights the significance of behavioural factors in the utilisation of psychological resources. G. Ciuhan *et al.*'s (2022) study demonstrated that teachers' well-being under pandemic-related stress is partly explained by problem-focused coping, i.e. active strategies aimed at restructuring work demands and personal responses. Y. Wang & Y. Wang (2022) indicate that organisational support influences the well-being of young teachers and the satisfaction of their basic psychological needs (autonomy, competence and relatedness). Gratitude is associated with working conditions and psychological well-being, and

teacher-student relationships may be an important factor in this association. Y. Zhai *et al*. (2025) emphasised in their study that professional identity strengthens occupational well-being and work engagement through mechanisms that reflect a more subjective and authorial position within professional activity.

Proactivity also plays a significant part in developing subjectivity, which is defined as the capacity to adapt to demands and transform the structure of activities. A key mechanism here is job crafting. During the pandemic, S. Kwon *et al*. (2021) and C. Lee & S. Chae (2025) found that the relationship between perceived stress and teachers' well-being was partly explained by job crafting and problem-focused coping. This suggests that psychological stability is supported by both internal states and active strategies for influencing work, such as reinterpreting tasks, changing modes of interaction, optimising resources and seeking more constructive formats of professional activity. In practice, this approach may manifest as the conscious "reconfiguration" of pedagogical contact, such as selecting teaching methods that reduce emotional overload, establishing communication rules, distributing emotionally demanding activities, and shifting the focus of interaction with students. At this stage, subjectivity becomes a practical stance rather than an abstract category: a lecturer who constructs their work acts from a position of authorship and responsibility. At the same time, however, lecturers' proactivity is not entirely autonomous; it is significantly influenced by the organisational context. Organisational support is associated with the well-being of young teachers. This finding is particularly important given that subjectivity exists within an environment that either supports autonomy and professional initiative, or systematically reproduces feelings of helplessness and a lack of control. When basic psychological needs are not met, even highly motivated lecturers may adopt a mode of psychological economy characterised by formal participation, risk minimisation and avoidance of innovation. Conversely, a supportive environment activates subjectivity as the capacity to experiment, develop, take responsibility for change and view professional competence as a resource rather than pressure. Studies by M. Villalta-Paucar *et al*. (2025) highlight another significant factor: positive socio-emotional dispositions, particularly gratitude, and the importance of relationships with students. The quality of these relationships can function as either a resource or a stressor. Gratitude as a disposition can shift attention from deficits to possibilities, and from "failures" to the significance of one's contribution. This supports a subjective position. Adopting this stance enables lecturers to resist the imposition of external evaluations and maintain a meaningful perspective on their profession. If gratitude strengthens readiness for proactive behaviour, it becomes a psychological resource for action, not merely an emotional state.

Another factor that contributes to professional growth is professional identity – the internal response to the questions, "Who am I within my profession?" and "Why does my work have meaning?" A strong professional identity enhances occupational well-being by fostering job satisfaction and engagement. It provides a meaningful framework that fosters internal motivation and sustainable engagement. A strong professional identity can protect against cynicism and the "burnout of meaning". Even in challenging environments, a strong professional identity can support the perception of meaning in students' development and the long-term outcomes of pedagogical work. Y. Zhai *et al*. (2025) suggest that satisfaction and engagement are behavioural and motivational manifestations of this subjective position; individuals do not merely perform their work, but actively shape their own professional trajectory. From a practical perspective, mindfulness is an evidence-based developmental resource and intervention strategy. Mindfulness programmes for teacher education students may improve mental health indicators within real educational environments.

J. de Carvalho *et al*. (2021) demonstrated that mindfulness interventions for teachers can influence not only educators' psychological states, but also learners' outcomes. Therefore, the psychological state of lecturers directly affects the group atmosphere, sense of safety, openness to dialogue and students' capacity to develop their own subjectivity. If mindfulness reduces lecturers' reactivity and enhances the quality of their psychological presence, then students may also learn to regulate themselves more consciously and take responsibility for their own development. Resource-oriented interventions therefore have dual value: they support lecturers and indirectly influence educational outcomes.

Thus, the obtained data make it possible to consider the psychological resources of professional growth among lecturers in socionomic specialties as a multi-level system in which emotional and motivational resources interact with the organisational environment and behavioural strategies, forming either a trajectory of development or a trajectory of exhaustion. These resources are not interchangeable: resilience may be critical under conditions of stress; psychological capital may function as a mechanism explaining transitions from job satisfaction to burnout; emotional intelligence may serve as the foundation of regulation and stability; and job satisfaction may represent the behavioural realisation of subjectivity within professional activity. Awareness and mindfulness may integrate these components, supporting the regulation of internal states and the stability of professional presence. For this reason, subjectivity should be interpreted not as an "additional" category but as the central point at which resources acquire the form of action – the capacity to act authorially, reflectively, and responsibly within the complex social reality of pedagogical work.

Conclusions

The psychological resources that facilitate professional growth among lecturers in sociological disciplines should be considered an integrated system of emotional, motivational and behavioural factors that promote well-being and mitigate the risk of burnout. Resilience and self-efficacy play particularly significant roles in this system, performing different functions. Resilience ensures stability under stress, while self-efficacy sustains professional confidence and engagement, as well as the stability of professional activity. Research has also shown that resilience among teachers can act as a mediator between stress, anxiety, and depressive symptoms, as well as subjective well-being. However, in the analysed model, self-efficacy did not demonstrate a mediating role. Emotional intelligence, psychological capital and self-awareness are key components of self-regulation, enhancing the capacity to manage internal states and make balanced professional decisions.

The transformation of resources into actual professional growth is achieved through proactive professional activity, the satisfaction of basic psychological needs, the development of a professional identity, engagement, and the quality of lecturer-student relationships. In this context, subjectivity acts as an integrative mechanism, ensuring responsibility and reflexivity within the professional roles of lecturers in socionomic disciplines. For lecturers in socionomic disciplines, mindfulness supports the capacity to remain present in complex interactions, recognise personal reactions, and avoid automatic responses (for example, refraining from defensive sarcasm, excessive control, or emotional distancing). This is directly linked to the subjective position, as subjectivity presupposes the conscious selection of behaviour rather than reactive responses. Lecturers' psychological resources form a holistic system, and subjectivity functions as the central mechanism of professional growth by combining resilience, proactivity, and meaning-making within the professional role. Practical approaches aimed at developing subjectivity and self-regulation have the potential to enhance well-being, reduce the risk of burnout and improve the quality of the

educational environment. The results obtained may contribute to the development of effective programmes for teachers' professional development. Further research could involve a deeper analysis of resources among lecturers in socionomic specialties specifically, taking into account the high level of emotional labour and the specific nature of professional interaction.

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Conflict of Interest

None.

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Психологічні ресурси професійного зростання викладачів соціономічних спеціальностей у контексті розвитку їх суб'єктності

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Анотація. Стаття присвячена актуальному питанню щодо формування професійної позиції викладачів. Професійне зростання викладачів соціономічних спеціальностей відбувається в умовах високої емоційної напруги та інтенсивної міжособистісної взаємодії, що підвищує вимоги до саморегуляції й відповідальності за психологічний клімат освітнього середовища. Це посилює ризик хронічного стресу та вигорання, знижуючи якість викладання і стійкість у професії. Водночас недостатньо з'ясовано, як саме психологічні ресурси перетворюються на професійне зростання і яку роль у цьому відіграє суб'єктність викладача. Метою роботи було визначення особливості психологічних ресурсів професійного зростання викладачів соціономічних спеціальностей та обґрунтування моделі їх реалізації в контексті розвитку суб'єктності. Показано, що емоційні чинники та соціоемоційні компетентності формують основу психологічної стійкості у взаємодії, тоді як резильєнтність і самоефективність підтримують витривалість, відновлення та професійну мотивацію, психологічний капітал та усвідомленість, підсилюють позитивну саморегуляцію та знижують реактивність. Встановлено, що провідним механізмом трансформації ресурсів у професійне зростання є суб'єктність викладача, яка реалізувалася через проактивну організацію діяльності, підтримання професійної ідентичності й залученості та задоволення базових психологічних потреб. Окреслено, що якість взаємин «викладач-студент» є специфічним ресурсом соціономічної сфери та модифікує ефективність ресурсів через довіру й емоційну безпеку. Зазначено, що психологічні ресурси викладача утворюють цілісну систему, а центральним механізмом професійного зростання виступає суб'єктність, що поєднує стійкість, проактивність і смислотворення у професійній ролі. Практичні підходи, спрямовані на розвиток суб'єктності та саморегуляції, мають потенціал підвищувати благополуччя, знижувати ризики вигорання і покращувати якість освітнього середовища. Отриманні дані можуть сприяти розробці ефективних програм професійного зростання вчителів

Ключові слова: освіта; благополуччя; вигорання; самоефективність; психологічний капітал

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Verbal interaction as a factor in the development of social intelligence in older preschoolers

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Abstract. The study aimed to investigate how verbal interaction influences the formation and development of social intelligence in older preschool children. The research was conducted as a theoretical, qualitative, comparative and interpretative analysis of academic and normative sources, examined in terms of the psychological, linguistic and pedagogical aspects of the issue. The results established that the social intelligence of older preschoolers has a multi-component structure and encompasses social cognition, emotional understanding, the interpretation of another person's intentions and experiences, social interaction experience, and behavioural flexibility. The study determined that verbal interaction facilitates the development of these components not merely as an accompanying element of communication, but as a mechanism for coordinating joint activity, aligning positions, verbalising emotional and mental states, explaining intentions, and regulating behaviour in interaction with adults and peers. It has been shown that dialogic speech is linked to the development of a child's ability to consider the position of another; communication with adults – to the acquisition of models for interpreting social situations; interaction with peers – to the formation of skills for reaching agreements and revising rules; and verbal accompaniment of role-play – with the development of social regulation of behaviour. The study established that the pedagogical conditions for the development of social intelligence in verbal interaction encompass the dialogical organisation of the educational environment, the encouragement of children's initiative in communication, the communicative richness of play, verbal support for joint activities, the creation of situations for discussing emotional states, intentions and actions, as well as involving the child in interaction with adults and peers. The relevance of considering the issue at the intersection of psychological, linguistic and pedagogical approaches has been demonstrated, as social intelligence in the senior preschool age is formed through meaningfully organised communicative practice. The practical significance of the study is the possibility of using

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its results to organise a communication-rich educational environment, improve role-play and prepare teachers to use dialogical forms of interaction with older preschoolers

Keywords: emotional competence; language games; emotional understanding; role-play; communicative skills

Introduction

At the beginning of the 21st century, a child's language development is increasingly seen as being linked not only to the acquisition of lexical and grammatical skills, but also to the development of the ability to understand others, interpret their intentions, emotional states, social roles and the rules of interaction. In the older preschool years, linguistic interaction serves as the environment for the formation of skills in reaching agreement, coordinating actions, emotional response, understanding the interlocutor's position, and regulating behaviour in accordance with the communicative situation. The increasing complexity of a child's social experience, the expansion of their circle of interpersonal contacts, and the growing role of the educational environment heighten the focus on speech as a factor in the development of social intelligence, which encompasses the ability to navigate interpersonal relationships, recognise emotional cues, and build productive interactions.

The issue of verbal interaction in early childhood has been examined in studies from various methodological perspectives. For instance, S. Ivakh & I. Palasevych (2020) focused on the psychological and pedagogical conditions of speech development in young children during communication with adults and demonstrated the decisive role of a communicatively rich environment in speech development. However, this approach emphasised an adult-centred model of interaction and the early stage of ontogenesis primarily, whereas in the older preschool age, the structure of communication became more complex due to the child's active involvement in interaction with peers, where speech performed not only a developmental but also a socio-coordinating function. Another research perspective was presented in the work by T. Ponomarenko & M. Naumenko (2023), in which the development of communicative competence in six-year-olds was examined in the context of project-based activities. In this case, speech was analysed as a tool for cooperation, coordination of actions and the child's inclusion in joint activities. This approach brought communicative development closer to the social sphere, although the main focus was on the competence-based outcome of interaction. In contrast, the study by L. Garashchenko & S. Kondratyuk (2021) demonstrated that the development of communicative competence in older preschoolers also took place through work with contemporary picture books, where speech was combined with a visual narrative, emotional experience and the interpretation of situations. Whilst project-based activities highlighted speech as a means of organising joint activity, the use of narrative-visual material revealed its potential as a mechanism for understanding social situations and the characters' experiences. A separate line of research linked speech development to the emotional sphere. The study by O. Bielova (2022), dedicated to the methodology of studying emotional literacy in older preschool children with speech disorders, demonstrated that the recognition, naming and differentiation of emotions constituted a substantial prerequisite for meaningful communication. Within this approach, speech emerged as a means of emotional encoding and decoding of social experience. At the same time, the focus on emotional literacy did not exhaust the broader issue of social intelligence, as the latter encompassed not only the ability to understand emotions, but also the ability to interpret behaviour, anticipate the

interlocutor's reactions, incorporate the context of interaction, and adapt speech to it. The issue became even more relevant in the context of the transformation of the communicative environment of childhood. In the study by O. Kanarova *et al.* (2024), the contemporary media landscape is examined as a means of developing social competence in older preschool children, and an expansion of socialisation channels beyond direct interpersonal contact is noted. However, the shift in focus towards the media environment has not diminished the importance of live verbal interaction; on the contrary, it has reinforced the need to clarify its role as a fundamental mechanism for the development of social awareness.

Further examination of the issue revealed that the communicative development of preschoolers was increasingly viewed as a process combining linguistic, cognitive and social factors. Thus, A. Brovchenko & O. Telna (2025), within the framework of a psycholinguistic approach to analysing the communicative competence of children with speech impairments, linked communication difficulties not only to the insufficient development of linguistic means, but also to the child's difficulty in participating fully in social interaction. From this perspective, speech was seen not as an isolated function, but as a mechanism for inclusion in a communicative situation. A position similar in logic but different in emphasis was presented by N. Golota & A. Karnaukhova (2022), who viewed dialogical interaction in the educational process of a preschool institution as a prerequisite for the development of communicative competence. Whilst the psycholinguistic approach focused on the internal mechanisms of speech, the primary emphasis was placed on dialogue as the form through which the child learned turn-taking, clarifying meanings and reconciling positions. For this reason, dialogical interaction became significant not only for linguistic but also for social development. Another aspect was highlighted by O. Pokotilo & Yu. Volynets (2023) linked the development of communicative competence in older preschoolers to constructive activities. In this case, speech was viewed as a means of coordinating actions, providing explanations and achieving a common outcome. Unlike specifically organised dialogical interaction, the communicative function of speech was revealed in practical cooperation, where agreement, the division of roles and consideration of the actions of others were substantial. A separate area of research focused on the influence of the digital and media environment. The study by T. Andriushchenko *et al.* (2021) demonstrates the expansion of educational opportunities using information and communication technologies, whilst L. Kobyletska & O. Maksymyshyn (2025) directly analyses the influence of the mass media on the development of communicative competence in preschool children.

However, despite this expansion of the communicative environment, direct verbal interaction did not lose its fundamental importance, as the skills of interpretation of others, response to reactions, and the ability to adapt behaviour to the communicative situation were developed through such interaction. Thus, the studies revealed certain aspects of communicative development, but the correlation between verbal interaction and the development of social intelligence in older preschoolers remained incompletely explored. This necessitated viewing verbal interaction not merely as a means of speech development, but as a factor in shaping a child's ability to navigate social situations and understand others.

The study aimed to provide a theoretical justification of the influence of verbal interaction on the development of social intelligence in older preschool children. In line with this aim, the following research objectives were identified: to reveal the structural components of social intelligence in older preschool children and to clarify its psychological content in the context of preschool development; to identify the mechanisms through which verbal interaction influences the development of social intelligence in older preschool children; to identify the pedagogical conditions under which verbal interaction facilitates the development of social

intelligence in older preschoolers within a preschool education setting.

Materials and Methods

The study employed a theoretical qualitative comparative-interpretative analysis design and aimed to identify the role of verbal interaction in the development of social intelligence in older preschoolers. The source base of the study consisted of academic and normative works relevant to the issues of children's social development, verbal interaction in preschool age, and the guidelines for preschool education. The corpus of sources included works that directly addressed issues of social intelligence, communicative development, dialogic speech, child socialisation, and the pedagogical organisation of the educational environment. Sources were selected based on criteria of thematic relevance, conceptual significance, interdisciplinary representativeness, and suitability for comparative analysis in psychological, linguistic, and pedagogical dimensions.

The first stage involved developing the analytical framework for the study, which was necessary to explore the social intelligence of older preschoolers as a phenomenon linked to social cognition, emotional understanding, the interpretation of another person's intentions and experiences, social interaction experience, and behavioural flexibility. A synthesis of the theoretical material revealed that the internal structure of social intelligence in older preschoolers is formed by at least five interrelated components: social cognition, emotional understanding, interpretation of another person's intentions and experiences, social interaction experience, and behavioural flexibility. These components formed the basis for the subsequent analysis of verbal interaction as a factor in the development of social intelligence in the senior preschool age group.

In the second stage, a qualitative comparative analysis was conducted of approaches to verbal interaction, dialogic speech, communication with adults and peers, the linguistic expression of emotional and mental states, and their significance for the development of a child's ability to understand others and coordinate interaction with them. Content analysis was used to identify consistent semantic components in the interpretation of speech interaction, thematic coding – to identify and group recurring categories, comparative-interpretative analysis – to compare ways of explaining the link between speech and social development across different scientific approaches, and categorical comparison – to establish conceptual overlaps between the psychological, linguistic and pedagogical dimensions of the problem. The thematic coding procedure involved the sequential reading of sources, the identification of meaningful fragments, their correlation with predefined analytical categories, and the subsequent generalisation of recurring thematic strands across the entire corpus of sources. The analysis was conducted based on the following categories: functions of speech interaction in early childhood, the role of dialogue in coordinating joint activities, the significance of communication with adults and peers, the linguistic expression of emotional and mental states, the development of emotional sensitivity, cooperation, the coordination of positions, and speech regulation of behaviour. During the analysis, the presence of the relevant category in the source, the recurrence of thematic emphases, and the characteristics of their conceptual interpretation were recorded.

The third stage involved the interpretation and synthesis of theoretical principles within the context of early years education guidelines. To this end, the provisions formulated in academic sources were compared with the approaches stipulated in Order of the Ministry of Education and Science of Ukraine No. v0033729-21... (2021), Decree of the Cabinet of Ministers of Ukraine No. 1557-2025-p "On Approval of the State Standard of Preschool Education" (2025), and the recommendations of UNESCO & UNICEF (2024). In addition, the analysed approaches were correlated with the findings presented by P. Leseman & P. Slot (2025) and with the methodological recommendations of UNESCO (n.d.). This

comparison aimed to identify the link between the scientific interpretation of speech interaction and pedagogical guidelines related to the dialogical organisation of the educational environment, the support of children's initiative, the communicative richness of play, verbal support for joint activities, and the creation of conditions for the verbalisation of emotional states, intentions and interpersonal meanings in early childhood.

Thematic coding and categorical analysis were used as research tools; Microsoft Excel 365 was used exclusively for the technical organisation, recording and comparison of analytical data. The reliability of the analysis was ensured by a re-examination of the source corpus, a systematic cross-checking of categorical matches, and a verification of the consistency of the identified thematic lines across the entire corpus of works analysed. The research was conducted following the principles of academic ethics and scientific integrity enshrined in the European Code of Conduct for Research Integrity (2023). The study utilised only open-access scientific and methodological sources, drawn upon exclusively for research purposes.

Results

Structural components of social intelligence in older preschool children. It is appropriate to view the social intelligence of older preschoolers not as a separate ability, but as a coherent system of interrelated skills that provide orientation in interpersonal interaction. At this age, its nature is manifested not in abstract knowledge about other people, but in specific forms of social behaviour: the child recognises the emotional states of their partner, correlates actions with possible intentions, considers the reaction of others during joint activities, adapts personal behaviour depending on the situation, and maintains contact during play, communication or conflict resolution. This approach provides grounds for defining social intelligence as an integrative construct formed at the intersection of cognitive, emotional and socio-behavioural development (Denham, 2023; Carlston *et al*., 2024). A synthesis of the theoretical material has shown that the internal structure of social intelligence in older preschoolers is formed by at least five interrelated components. The first of these is linked to social cognition, that is, the child's ability to notice meaningful signals of interaction, distinguish social roles, navigate the logic of other people's behaviour, and relate a specific action to the broader context of the situation. This refers to an understanding of the social situation in which the child is no longer limited to the immediate perception of an action, but attempts to determine who is initiating the action, who is expecting a response, who is breaking the rules, and who is supporting the interaction. In the older preschool years, this is manifested in the ability to distinguish between play and conflict, friendly initiative and rejection, and helping and controlling, as well as in the ability to recognise that the same action can have different meanings depending on the situation. For this reason, social cognition in this context serves as a primary guide in interpersonal interactions.

The second component is emotional comprehension, which encompasses not only the recognition of emotions but also linking them to causes, consequences and the nature of interpersonal relationships. For older preschool children, a key development is the transition from focusing on outwardly expressed emotions to interpreting them in context. The child begins to associate sadness with the loss of a desired role, joy with being accepted into a game, hurt with unmet expectations, and fear with the uncertainty of a situation or the behaviour of another. Within the framework of social intelligence, this component provides not only an emotional response but also a meaningful interpretation of a partner's behaviour, as another person's emotional state gradually becomes a guide for the child in choosing how to act. Accordingly, emotional understanding should be linked not only to displays of empathy but also to the development of the ability to build interactions based on the emotional atmosphere of the situation (Denham, 2023).

The third component is manifested in the interpretation of another person's intentions, feelings and perspective; that is, in the transition from perceiving an external action to recognition of its internal motivations. In this case, a child's ability to relate behaviour not only to what has already happened, but also to what the other person wants, expects, does not know or is striving for is implied. This component demonstrates why a playmate insists on a particular role, why a peer refuses to join in an activity, or why an adult change the rules or demands a different way of behaving. In the older preschool years, this dimension of social intelligence facilitates the transition from describing behaviour to explaining it. The child begins to focus not only on the external outcome of an action but also on the internal perspective of the other person, which provides more complex forms of interaction, agreement and behavioural adjustment (Carlston *et al.*, 2024).

The fourth component in the structure of social intelligence is social experience of interaction. A theoretical comparison of the literature shows that social intelligence does not develop outside of recurring situations involving cooperation, conflict, coordination, imitation, agreement and adherence to group rules. Social experience in this context should be understood as the accumulation and gradual generalisation of ways of participating in interaction. A child not only experiences individual communicative events but also, based on these, forms an understanding of acceptable and unacceptable behaviours, the consequences of the initiative, and the need to take others' reactions into account. In the older preschool years, this experience becomes more structured: the acquired patterns of interaction begin to be applied to new situations, and previous failures or successful agreements influence future choices of action. Therefore, social intelligence acquires a practical dimension and ceases to be merely a potential ability.

The fifth component is behavioural flexibility, that is, the ability to adapt one's actions, responses and participation in joint activities depending on the social context. Theoretical analysis suggests that it is the result of the coordinated functioning of the preceding components. If a child perceives the situation, recognises their partner's emotional state, interprets their intentions and draws on previous experience of interaction, they can not only react impulsively but also adjust personal behaviour. In the older preschool years, this is manifested in the ability to change roles, abandon an initial insistence, explain one's position, give a response that maintains contact, or move from conflict to agreement. Behavioural flexibility within this framework is not an external addition to social intelligence, but rather its functional manifestation, as it is through this that it becomes apparent to what extent a child is capable not only of understanding another person, but also of adjusting personal behaviour (Smith & Hart, 2010; Hopkins *et al.*, 2017). A comparison of these components shows that they are interdependent. Social cognition provides the basis for the determination of what is happening in the interaction; emotional understanding establishes affective meaning; the interpretation of intentions and experiences can provide a shift from external observation to an explanation of behaviour; social experience provides a repertoire of response patterns; behavioural flexibility makes it possible to apply all the preceding abilities in a specific situation. Consequently, social intelligence in late preschool age emerges as a system within which perception, interpretation, emotional response and behavioural regulation mutually reinforce one another. This system makes it possible for a child not only to establish contact but also to maintain it, restore it after a breakdown, change modes of interaction, and build joint activities based on consideration of the other person's perspective. A theoretical comparison of the literature has also improved precision of definition of the age-specific characteristics of this development. The transition from situational reactions to more complex social reasoning is characteristic of the older preschool age. The child begins to consider not only

the apparent action of their partner, but also the possible reason for this action, its emotional context, the role position, and the expected outcome. Social prediction becomes more complex: it becomes possible to anticipate a peer's reaction to a change of roles, to a refusal, to a remark or a suggestion; the ability to relate personal words and actions to the possible effect on another person increases. This means that social intelligence in late preschool age is functional in nature and ensures the child's integration into a real system of interpersonal relationships, rather than merely the acquisition of isolated social concepts (Denham, 2023). Figure 1 summarises the structural components of social intelligence in late preschoolers.

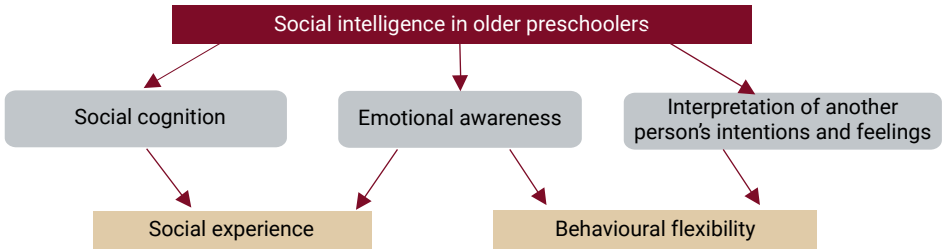

Figure 1. *Structural components of social intelligence in older preschool children*

Source: *compiled by the author based on P. Smith & C. Hart (2010), B. Hopkins et al. (2017), S. Denham (2023), D. Carlston et al. (2024)*

Figure 1 illustrates the structural components of social intelligence in older preschoolers, which collectively ensure the child's ability to navigate interpersonal interactions. The diagram shows that its content is formed through a combination of social cognition, emotional comprehension, interpretation of another person's intentions and experiences, social interaction experience, and behavioural flexibility. This representation demonstrates that social intelligence in preschool age has a multi-component rather than a linear structure, in which individual elements do not exist in isolation but interact with one another. Consequently, it is appropriate to view the social intelligence of older preschoolers as an integrative construct that combines the cognitive, emotional, and socio-behavioural dimensions of development. Its structure encompasses not only the child's ability to understand a social situation, but also the ability to interpret another person's state, draw on experience of interaction, and adapt personal behaviour to the context. This interpretation provides the basis for further consideration of verbal interaction as a factor that ensures the coordination of these components in actual communicative practice.

Mechanisms of influence of social intelligence based on verbal interaction. A theoretical comparison of studies on children's interaction, dialogic speech, communication with peers, and the linguistic expression of mental states provides grounds for viewing linguistic interaction as one of the mechanisms underlying the development of social intelligence in older preschoolers. In this case, not only the use of speech as a means of conveying information is referred to, but also to a form of communication within which a child learns to take another person into account, to relate personal response to their partner's reaction, to clarify their position, to adjust their course of action, and to maintain a sense of shared interaction. Through verbal exchange, the social situation becomes clearer to the child, as verbalisation can be used to identify roles, intentions, rules, reasons for disagreement and ways of resolving them. In this interpretation, verbal interaction is not merely an external accompaniment to social development, but a process in which comprehension,

coordination, emotional attunement and behavioural regulation are integrated (Church & Bateman, 2022). One of the findings of the analysis is that dialogic speech creates the conditions for coordinating joint activity. In the older preschool years, dialogue is no longer limited to taking turns or responding to an adult's questions, but becomes a means of coordinating actions, roles and the sequence of joint steps. In interaction, the child not only responds, but also clarifies, asks for clarification, agrees, disagrees, suggests an alternative – in other words, uses speech to regulate the shared situation. This means that dialogical interaction is associated with the development of the ability to take another person's perspective into account whilst maintaining personal role in the interaction. The result is not merely the ability to take turns speaking, but the ability to coordinate behaviour within a social context. Therefore, dialogue in early childhood should be viewed as a mechanism for transitioning from individual action to jointly organised activity, in which social intelligence is manifested through the verbal coordination of intentions, expectations and decisions (Church & Bateman, 2022).

The analysis also showed that verbal interaction with adults is substantial in this process. Communication with a teacher or parents provides the child with models for explaining social situations, examples of how to verbalise emotional states, and ways of interpreting other people's behaviour. In such situations, the adult does not merely initiate communication but structures its content: they name the emotion, explain the reason for an action, suggest a linguistic form for describing an intention, and compare the actions of different participants in the event. As a result, the child learns that a social situation can be described not only through action, but also through motive, feeling, intention and rule. This changes the very nature of social understanding: it becomes mediated by language and less dependent on immediate external impressions. In the older preschool years, interaction with adults ensures that the child engages with such models of interpretation, where an event is interpreted in terms of "wanted", "took offence", "did not understand", "expected", "agreed", "did not agree". Consequently, adult speech serves as a means of conceptualising the child's social experience. Another mechanism is linked to communication with peers, where verbal interaction takes on a more horizontal character. Whilst in interaction with adults, the child largely enters an already structured model of explanation, and communication with peers requires independent coordination of positions. In such situations, remarks aimed at reaching an agreement, asserting the role, revising the rules, clarifying the sequence of actions, explaining the reasons for disagreement, or accepting a partner's proposal are most evident. In theoretical terms, this provides grounds for linking peer talk to the development of those components of social intelligence responsible for cooperation, coordination of positions and behavioural flexibility. The child learns to consider not only personal intentions but also the interests of the other participant in the interaction; not only to put forward a proposal but also to support it with an argument; not only to react to conflict but also to use speech to transform it into an agreement. Thus, communication with peers serves as an environment in which social intelligence takes on a functional form through the constant comparison of position with that of a partner (Cekaite *et al.*, 2017).

One particular finding of the theoretical analysis concerns the verbal accompaniment of play. In early childhood, play is a space where a child not only performs a role but also constantly coordinates it with other participants through speech. In play, rules are verbalised, roles are assigned, characters' actions are clarified, changes are introduced to the plot, violations are explained, and the sense of shared interaction is restored after a conflict. This means that speech in a play situation is not an adjunct to action, but forms part of the very mechanism of its organisation. Through the verbal accompaniment of play, the child learns to correlate their role with the behaviour of others, to adapt personal actions in line

with the development of the plot, and to accept or revise the proposed rules. Within the structure of social intelligence, this is linked to the transition from a situational reaction to an action that considers the system of relationships between participants. Accordingly, the verbal accompaniment of play should be interpreted as a mechanism of social regulation of behaviour, where the child master's coordination, collaboration and the joint construction of meanings. Another mechanism through which verbal interaction exerts influence is manifested through the verbalisation of emotional and mental states. An analysis of the literature shows that the development of social intelligence is linked not only to the child's ability to perceive another's state, but also to their acquisition of the linguistic means to denote it. Words that name emotions, desires, beliefs, expectations, doubts, disagreements or hidden motivations translate an inner state into a form that is accessible for understanding, comparison and discussion. As a result, the child learns to recognise the mental content behind an action, that is, moves from an external description of behaviour to explaining it in terms of internal states. In this context, verbal interaction serves the function of mentalisation, as it provides the child with a tool for understanding that another person may want, know, not know, be mistaken, take offence, wait, or change their intentions. Consequently, discourse about internal states does not merely expand the child's vocabulary but alters the very way they participate in social situations. Social intelligence, in this case, develops through an increasing ability to relate behaviour to mental causes, rather than merely to external outcomes (Bartsch & Wellman, 1995).

Within this same mechanism, a correlation between speech and emotional sensitivity can be observed. When a child can name an emotion, to hear it named in interaction with an adult or a peer, and to compare different emotional reactions to a single event, they gradually move beyond simple emotional contagion. Instead of an immediate response, a more complex form of social reaction emerges, which incorporates the cause of the emotion, its intensity, direction and connection to behaviour. This broadens the ability to relate personal state to that of another and reduces dependence on impulsive reactions. Thus, the verbalisation of emotional states acts as a mechanism for the transition from an affective reaction to an emotionally mediated understanding of the social situation. Theoretical analysis has also shown that verbal interaction influences the development of social intelligence through the explanation of personal intentions. In the older preschool years, the ability to explain why a child wants to act in a particular way, why they propose a certain role, or why they disagree with a partner, becomes an element of social coordination. Explaining one's intention makes the action comprehensible to the other person, thereby reducing the probability of conflict based solely on a clash of actions without mutual interpretation. When a child learns to express their desires in a form accessible to others, they simultaneously learn to recognise that their partner also has the right to an explanation. In this sense, speech not only expresses a position but also creates a space for its social contextualisation. Through such communicative acts, social intelligence takes the form of mutual awareness, rather than merely an individual's perception of the other (Church & Bateman, 2022).

A significant finding also concerns the role of the pragmatic component of speech. In the approaches analysed, social meaning lies not only in what the child says, but also in how they say it: whether they invite interaction, take turns, can change their speech form depending on the situation, or use explanations, clarifications, softening of disagreement, requests, and agreements. The pragmatic organisation of speech is directly linked to social intelligence, as this reflects the ability to relate speech form to context and the interaction partner. The older preschool age is characterised by the child beginning to use speech not only to denote an object or action, but also to regulate relationships between

interaction partners. This expands the functions of speech from nominative and communicative to coordinative and interpretative. As a result, speech interaction serves not only as a channel of communication but also as a tool for the social organisation of a situation. A comparison of scientific approaches concluded that the influence of speech interaction on social intelligence is complex in nature. Dialogic speech facilitates the coordination of joint activities; communication with adults introduces children to models for interpreting social situations; interaction with peers develops the ability to reach mutual understanding; verbal accompaniment during play fosters social regulation of behaviour; the verbalisation of emotional and mental states deepens understanding of another person's inner world; the explanation of personal intentions and the pragmatic organisation of utterances expand the possibilities for relating actions to the social context. Together, this demonstrates verbal interaction as a mechanism through which various components of social intelligence not only manifest themselves but also achieve internal coherence. In verbal exchange, social cognition is combined with emotional understanding, the interpretation of another's position with the regulation of behaviour, and the experience of interaction with the formation of new ways of coordination and cooperation (Cekaite *et al*., 2017; Church & Bateman, 2022). Table 1 summarises the mechanisms through which verbal interaction influences the development of social intelligence in older preschoolers.

Table 1. *The mechanisms by which verbal interaction influences the development of social intelligence in older preschoolers*

The mechanism of verbal interaction	How it works	Development of components of social intelligence	Overall result
Conversational speech	Sequence of responses, clarifications, follow-up questions, agreement, objections, and suggestions for alternative courses of action	Social cognition; behavioural flexibility	Coordination of joint activities and harmonisation of actions
Interaction with an adult	Identification of emotions, explanation of reasons for actions, verbal expression of intentions, interpretation of rules and social situations	Emotional comprehension: interpreting another person's intentions and feelings	Mastering models for interpreting social situations
Interaction with peers	Reaching an agreement, asserting the role, clarifying the rules, explaining the reasons for disagreement, accepting or revising the partner's proposals	Social interaction experience; behavioural flexibility	Aligning positions and developing cooperation
Voice-over for the game	Assigning roles, clarifying the rules, refining the plot, explaining breaches, and restoring cooperation after a conflict	Social experience of interaction; social cognition	Social regulation of behaviour in collaborative activities
Verbalisation of emotional states	Expressions of joy, anger, fear, disagreement, and satisfaction; linking emotions to causes and effects	Emotional awareness	Transition from an emotional reaction to a conscious understanding of emotions
Verbalising mental states	Expressing desires, intentions, expectations, knowledge, mistakes, doubts and hidden motives	Interpreting another person's intentions and feelings; social cognition	Comprehension of another person's inner world
Explanation of personal intentions	Verbal explanation of the desired role, course of action, reason for disagreement or suggestion	Behavioural flexibility; social interaction experience	Reduction of conflict and improvement of mutual understanding

Table 1. *Continued*

The mechanism of verbal interaction	How it works	Development of components of social intelligence	Overall result
Pragmatic approach to speech	Invitations to engage, requests, clarifications, softening of disagreement, and adapting one's manner of speaking to suit the conversation partner and the situation	Social cognition; behavioural flexibility; emotional understanding	Regulating relationships and selecting appropriate language in accordance with the context

Source: *compiled by the author based on K. Bartsch & H. Wellman (1995), A. Cekaite et al. (2017), A. Church & A. Bateman (2022)*

Table 1 summarises the main mechanisms through which verbal interaction influences the development of social intelligence in older preschoolers. Its content shows that the influence of speech is realised through several interrelated channels: dialogical coordination of joint activities, communication with adults and peers, verbal accompaniment of play, verbalisation of emotional and mental states, explanation of personal intentions, and verbal regulation of behaviour. All these mechanisms are linked not only to the expansion of the child's communicative experience, but also to the development of the ability to comprehend another person's perspective, coordinate actions, interpret internal states, and adapt behaviour to the social context.

Thus, verbal interaction in the later preschool years acts as a mechanism through which the cognitive, emotional and behavioural-regulatory components of social intelligence are integrated. Its influence is realised not through the mere fact of verbal activity, but through specific forms of communicative participation, within which the child learns to understand others, coordinate interaction, negotiate, explain personal actions and consider changes in the social situation. This provides grounds for considering verbal interaction as one of the factors ensuring the functional development of social intelligence in older preschoolers.

Pedagogical conditions for the development of social intelligence in verbal interaction. A theoretical comparison of academic and normative sources provides grounds for asserting that the development of social intelligence in older preschool children during verbal interaction is determined not by the mere fact of the child's involvement in communication, but by the nature of the pedagogically organised environment in which this communication takes place. Within this approach, verbal interaction is viewed as a component of the educational process that determines the ways of making contact, models for interpreting emotional and behavioural manifestations, forms of coordinating actions, and rules for participating in joint activities. Under such conditions, social intelligence is formed not only through the individual accumulation of experience, but also through pedagogically supported situations in which the child is given the opportunity to speak, listen, explain, ask questions, negotiate, respond to the position of others, and adapt their behaviour depending on the context. Accordingly, the focus is not on individual speech exercises, but on educational conditions that ensure the child's systematic inclusion in meaningful communicative interaction (Order of the Ministry…, 2021; UNESCO, n.d.).

The first pedagogical condition is linguistic play. A theoretical comparison of scientific and normative sources provides grounds for viewing linguistic play as a specific form of verbal interaction, within which linguistic activity, the semantic coordination of actions, the interpretation of a partner's remarks, and the varied use of linguistic means in accordance with the communicative situation are combined. In the context of the development of social intelligence, its significance lies in the fact that the child not only uses words but also takes into account the other person's

reaction, selects a linguistic form in accordance with the rules of interaction, correlates personal utterance with the partner's communicative intent, and changes the manner of linguistic action depending on the course of the joint activity. Linguistic play creates conditions for the development of social cognition, emotional comprehension, the interpretation of another person's intentions, and behavioural flexibility, as it requires the recognition of meanings, responding to role changes, adherence to the rules of linguistic participation, and the coordination of actions within the communicative space. The pedagogical significance of language is determined by the fact that it shifts speech from the realm of reproducing linguistic units to the realm of interaction, where words are used as a means of agreement, clarification, explanation, linguistic influence and the joint construction of meaning. Therefore, the inclusion of linguistic play in the educational environment creates the conditions for the targeted development of social intelligence in the later years of early childhood (UNESCO & UNICEF, 2024; Leseman & Slot, 2025).

The second pedagogical condition is the encouragement of children's initiative in communication. A comparison of academic and regulatory sources shows that the development of social intelligence is not fully accomplished in conditions where the child remains merely the recipient of instructions or the executor of an adult's linguistic demands. Its development requires a pedagogical environment in which the child is given the opportunity to independently initiate interaction, address communication partners, ask questions, formulate suggestions, explain personal ideas, argue their position and respond to alternative points of view. In this context, supporting initiative does not mean formally approving every utterance, but rather creating communicative situations in which a child's response carries substantive weight, influences the course of the interaction and shapes its further development. Under such conditions, speech fulfils not only a function of expression but also a function of social influence, which requires consideration of the reaction of the other participant in the communication, aligning personal intentions with those of one's partners, and adjusting the manner of verbal participation accordingly. As a result, skills of agreement, experience of participating in communicative interaction, and the ability to regulate behaviour through speech are formed. Educational support for children's initiative is thus linked to the development of the ability to appropriately choose the content, form, timing and communicative purpose of an utterance within a specific social context (Order of the Ministry…, 2021; UNESCO, n.d.).

The third pedagogical condition is the dialogical organisation of the educational environment. Theoretical analysis shows that verbal interaction becomes developmentally significant when a child is engaged not merely in the reproductive repetition of ready-made utterances, but in an exchange of remarks based on mutual consideration of each other's perspectives. Dialogicality in this case means that the educational environment encourages the child's questions, which can be answered in a variety of ways, and creates situations for clarification, explanation, justification, agreement and disagreement. In such an organisation of communication, utterances begin to be perceived not merely as naming an object or an action, but as an expression of a position, intention and attitude towards the other participant in the interaction. As a result, speech becomes a means of aligning personal perspective with that of another person. This creates conditions for the development of such components of social intelligence as orientation in interpersonal situations, interpretation of a partner's position, and the ability to adjust personal behaviour in response to changes in the communicative context. Within the context of early years education, such a dialogical approach involves not only children's linguistic activity but also a specific type of pedagogical interaction in which the adult does not limit communication to the "correct" answer but supports the process of

joint sense-making (UNESCO & UNICEF, 2024; Leseman & Slot, 2025).

The fourth pedagogical condition is the communicative richness of role-play. In theoretical and normative sources, play is presented as a form of activity in which speech is integrated into the very structure of social interaction. During the game, the child not only plays a role but also coordinates it with other participants, introduces rules, adjusts the course of events, explains the meaning of actions, agrees on the distribution of roles, comments on violations and restores the sequence of joint activity. This means that pedagogically organised play creates situations in which speech becomes a tool for coordination, interpretation and regulation, rather than merely an accompaniment to action. In such an environment, social intelligence develops through the constant comparison of one's role with that of other participants, through the need to consider the logic of the plot, the reactions of partners and jointly upheld rules. The communicative richness of the game is linked not to the number of utterances, but to the extent to which speech is involved in solving a shared task, redistributing roles, clarifying intentions and coordinating behaviour. Under such conditions, play becomes not only a symbolic but also a socio-cognitive practice, within which the child learns ways of interacting with other people (UNESCO & UNICEF, 2024; Decree of the Cabinet…, 2025).

The fifth pedagogical condition is the verbal accompaniment of joint activities. The development of social intelligence requires that a child's interaction with other participants in the educational process is not limited to the parallel performance of actions but is accompanied by their verbalisation. When joint activities are described, commented on, explained and reviewed through speech, the child gains the opportunity to understand more precisely the sequence of events, the division of responsibilities, the expectations of partners and the meaning of personal participation. In this case, speech acts as a form of organising experience: through it, the rules of cooperation are established, the causes of difficulties are clarified, the sequence of actions is determined, and changes in the participants' plans or intentions are noted. This creates conditions for the development of behavioural flexibility, as the child learns to change their mode of participation not impulsively, but based on situational awareness. Verbal support for joint activity is also linked to the development of social forecasting, as it provides a more accurate interpretation of others' expectations, the appropriateness of personal actions, and the possible consequences of changes in the course of interaction (Leseman & Slot, 2025).

The sixth pedagogical condition is the creation of situations for discussing emotional states, intentions and actions. Theoretical analysis suggests that social intelligence develops more fully when the inner meaning of behaviour becomes the subject of verbal reflection. If pedagogical interaction involves naming emotions, explaining their causes, comparing different reactions to a single event, and discussing the intentions of characters in a game or real participants in communication, the ability to link an external action with an internal state is formed. This changes the nature of social interpretation: instead of directly equating an action with its result, the ability to perceive the motive, expectation, or emotional cause of behaviour develops. Discussing emotional states and intentions in pedagogically organised communication also contributes to the differentiation of the vocabulary describing a person's inner world. As a result, not only does the range of linguistic means increase, but so does the accuracy of social interpretation, as the child acquires words to denote phenomena that were previously perceived merely as a general impression of another's behaviour. Such linguistic mediation of a person's inner world is directly linked to the development of social cognition, emotional understanding and the interpretation of another person's perspective (UNESCO, n.d.; UNESCO & UNICEF, 2024).

The seventh pedagogical condition involves engaging the child in interaction with various

partners – adults and peers. A theoretical comparison of sources shows that different types of partnership lead to different trajectories of social intelligence development. Interaction with adults establishes models for interpreting social events, introduces the child to discussing emotions, causes, rules and consequences, and shapes the experience of meaningful communication. Interaction with peers, on the other hand, requires independent negotiation of positions, defending personal ideas, accepting rejection, revising rules and re-establishing contact after a breakdown in interaction. If the educational environment provides both types of communicative experience, the child's social intelligence develops more comprehensively: on the one hand, the child acquires meaningful models for understanding social situations; on the other, they practise the independent application of these models in joint activities. The combination of vertical and horizontal interaction creates the conditions for the development of both the interpretation of others' behaviour and the regulation of personal actions in situations of real communicative choice (Decree of the Cabinet…, 2025; Leseman & Slot, 2025).

The results of the analysis also provide grounds for asserting that the pedagogical conditions for the development of social intelligence in verbal interaction must be systematic rather than sporadic. Creation of a single communicatively rich situation does not in itself ensure a lasting effect if it is not supported by the overall logic of the educational environment. In this context, pedagogically organised verbal interaction should encompass various forms of a child's everyday life in a preschool setting: play, discussion, joint task completion, conflict resolution, commenting on characters' behaviour, explaining personal actions, and collective decision-making. It is the systematic nature of such practices that transforms individual speech episodes into accumulated social experience. This means that the development of social intelligence is linked not to isolated speech-stimulation techniques, but to the consistent inclusion of the child in those forms of communicative participation where words serve as a means of interpretation, coordination and self-regulation (Order of the Ministry…, 2021).

A review of academic and regulatory sources also suggests that the development of social intelligence is related to the communicative accessibility of the educational environment. This means that children must be given the opportunity to express themselves, to be heard, to revisit personal comments, to clarify them, to change their position, or to question the proposed solution. Communicative accessibility is not limited to a generally supportive atmosphere; it involves specific pedagogical approaches in which the child has a genuine right to participate in discourse. This approach is substantial for social intelligence, as without the opportunity to engage as an active participant, the child does not gain experience of social interaction, and consequently, their speech does not become a tool for interpretation of another person. Accordingly, linguistic interaction develops social intelligence not in and of itself, but when it is pedagogically organised as a space for mutual address, coordination and interpretation. Figure 2 presents the pedagogical conditions for the development of social intelligence in older preschoolers through linguistic interaction. Figure 2 summarises the pedagogical conditions for the development of social intelligence in older preschoolers through verbal interaction. The diagram illustrates that such development is determined not by individual language exercises, but by the organisation of the educational environment, within which the child is systematically engaged in linguistic play, dialogic interaction, initiates communication, participates in communicatively rich role-play, accompanies joint activities with speech, discusses emotional states, intentions and actions, and interacts with adults and peers. The combination of these conditions facilitates the transition from isolated speech acts to speech interaction as a means of comprehending others, coordinating actions, cooperating and regulating behaviour.

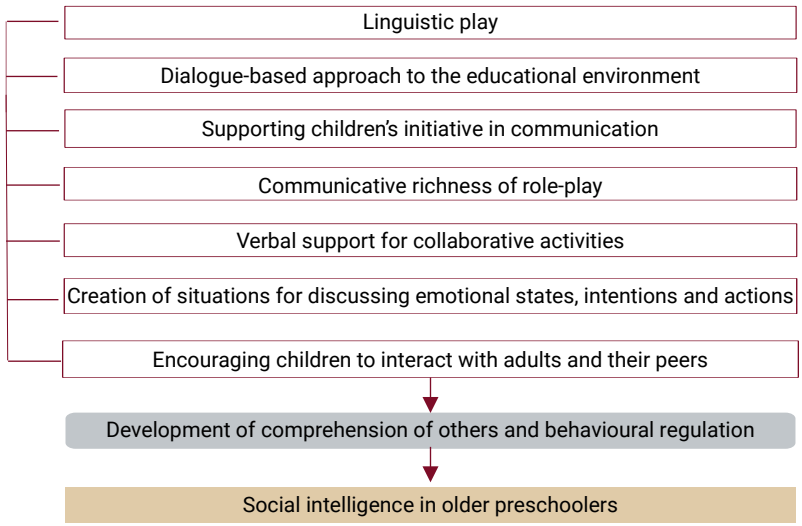

Figure 2. *Educational conditions for the development of social intelligence in older preschool children through verbal interaction*

Source: *compiled by the author based on Order of the Ministry of Education and Science of Ukraine No. v0033729-21… (2021), UNESCO & UNICEF (2024), Decree of the Cabinet of the Ministers of Ukraine No. 1557-2025-p "On Approval of the State Standard of Preschool Education" (2025), P. Leseman & P. Slot (2025), UNESCO (n.d.)*

Thus, the pedagogical conditions for the development of social intelligence in verbal interaction encompass the dialogical organisation of the educational environment, the encouragement of children's initiative in communication, the communicative richness of role-play, verbal support for joint activities, the creation of situations for discussing emotional states, intentions and actions, as well as involving the child in interaction with various partners – adults and peers. Together, these conditions demonstrate that the pedagogical potential of verbal interaction lies not in increasing the number of verbal contacts, but in organising communicative experiences in such a way that the child learns to perceive others, coordinate actions, regulate their behaviour, and transform social situations into spaces of meaningful interaction. In this context, verbal interaction serves not only as a means of speech development but also as a pedagogically guided environment for the formation of social intelligence in older preschoolers.

Discussion

The findings are consistent with previous studies in which social-emotional development in early childhood has been linked to the quality of educational interactions, the structure of the communicative environment, and specifically designed pedagogical interventions. A meta-analytic review by D. Murano *et al.* (2020) shows that early childhood social-emotional learning interventions are associated with the development of social and emotional skills and a reduction in problem behaviour. A similar trend is evident in the systematic map of systematic reviews prepared by D. Djamnezhad *et al.* (2021), where social-emotional learning in preschool settings was considered a component of the early educational environment linked to subsequent educational and behavioural outcomes. This corresponds with the findings of the present study, in which the social intelligence of older preschoolers was defined as a multi-component construct encompassing social cognition, emotional awareness, the interpretation of

another person's internal states, experience of interaction, and behavioural flexibility.

The findings regarding the mechanisms underlying the effects of verbal interaction are also consistent with previous research. A systematic review by P.-M. Washington-Nortey *et al.* (2022) showed that interaction with peers is associated with speech development in preschoolers, which confirms the conclusion that communication with peers serves not only as a channel for linguistic exchange but also as an environment for coordinating positions, distributing roles and sustaining joint activity. In an analysis of teachers' interaction strategies with children aged 2-5, S. Houen *et al.* (2022) concluded that rich conversational situations depend on the way in which the child is pedagogically engaged in dialogue. This conclusion aligns with the findings of the present study, where the development of social intelligence is linked not to the quantity of verbal contacts, but to the quality of dialogic interaction, verbal accompaniment of joint activities, and discussion of emotional states, intentions and actions. In a systematic review of children's social interaction in preschool settings, F. Aya & S. Shigeki (2022) demonstrate that it encompasses not only speech but also participation in joint actions, mutual responsiveness and behavioural coordination. This corresponds with the conclusion of the present study that verbal interaction does not exist in isolation from the broader context of joint activity, but is embedded within playful, behavioural and emotionally rich interaction. In this sense, speech serves not merely as a means of expression, but also of explanation, coordination, agreement and behavioural regulation. At the same time, the conclusion regarding the significance of verbalising emotional and mental states is consistent with the approach presented by K. Bartsch & H. Wellman (1995), on which the analytical section of the study was based: the verbalisation of internal states creates the conditions for a transition from the external perception of behaviour to its explanation in terms of desires, intentions, knowledge and experiences.

The pedagogical implications of these findings are also supported by research and normative approaches to early years education. In a meta-analysis of social interventions for preschool children with early emotional and behavioural difficulties, X. Dong *et al.* (2023) demonstrated a link between targeted pedagogical interventions and the development of social skills. This is consistent with the findings of the present study, in which the development of social intelligence in verbal interaction is not viewed as a spontaneous process, but is linked to specific pedagogical conditions. In their analysis of the quality of adult-child interaction in early education, S. Howard *et al.* (2024) also demonstrated its link to developmental and educational outcomes. This approach is consistent with the conclusion that a dialogical organisation of the educational environment, support for children's initiative, communicative richness in play, verbal accompaniment of joint activities, and the involvement of children in various forms of interaction are conditions for the development of social intelligence.

A similar thematic focus can also be observed in studies examining the linguistic expression of emotional states, the relationship between language and social cognition, and the role of the linguistic environment in preschool education. In a systematic review on "emotion talk" in early childhood, K. Houston *et al.* (2024) demonstrated that talking about emotions is linked to the development of emotional comprehension, social interaction, and a child's ability to make sense of internal states. This is consistent with the findings of the present study, in which the verbalisation of emotional and mental states was considered as one of the mechanisms for the development of social intelligence. A similar finding is presented in the systematic review by E. Grau-Husarikova *et al.* (2024), which analysed the relationship between language and social cognition and emotional competence in typical and atypical development. This study demonstrates that linguistic abilities are linked to the comprehension of social information, the interpretation of internal states,

and the development of emotional competence. This corresponds with the conclusion of the present study that linguistic interaction in late preschool age combines linguistic, psychological, and socio-behavioural dimensions. This finding is further supported by a series of meta-analyses by K. Wieczorek *et al.* (2025), which established a link between language abilities and social competence in children with and without speech disorders. In the present study, this link was specified in terms of the mechanisms of verbal interaction: agreement on positions, interpretation of the partner's reaction, verbalisation of internal states, and explanation of personal intentions.

The pedagogical implications of these findings are also consistent with research in which the social development of preschool children has been examined through their interactions with peers and their inclusion within the group. P. Kutnick & J. Colwell (2024) demonstrated that peer-based relational intervention in a preschool setting is associated with the development of social competence and social inclusion. This is consistent with the findings of a study in which interaction with peers was viewed as an environment for developing skills in negotiation, rule-making, cooperation and maintaining contact. The difference lies in the fact that in the study by P. Kutnick & J. Colwell, the focus is on the intervention format, whereas in this article, the emphasis is shifted to the linguistic mechanisms through which peer interaction influences social intelligence. This clarification specified that peer interaction develops social understanding not in and of itself, but through the linguistic coordination of roles, positions and actions. A similar inclusive perspective is evident in the systematic review by S. Keles *et al.* (2021), which emphasises interventions that promote the social inclusion of preschool children from immigrant and ethnic minority families. In this study, social inclusion is linked to the organisation of the environment, which ensures the child's participation in interactions with peers and adults. This is consistent with the conclusion of this article that the development of social intelligence depends on pedagogically organised conditions, namely on the dialogical structure of the educational environment, the encouragement of initiative in communication, and the inclusion of the child in various forms of interaction. The findings regarding the role of adults in organising the language environment are also consistent with the systematic review by E. Hadley *et al.* (2022a), which analysed teacher language practices and their relationship with children's oral language outcomes in early educational settings. This review shows that teachers' language practices depend on the goals of the interaction, the context, and the composition of the participants. This aligns with the conclusion of the present study that verbal interaction with an adult is not a neutral accompaniment to the educational process, but rather a model for interpreting the social situation in which the child learns ways of explaining actions, emotions and intentions.

In a meta-analysis of teacher language practices in early learning settings, E. Hadley *et al.* (2022b) demonstrate a link between teachers' language practices and children's language outcomes. This is consistent with the conclusion of the present study that the role of the adult in linguistic interaction lies in organising forms of communication in which the child receives models for explaining social situations, expressing emotional states through language, and coordinating joint activities. In the study by J. Finders *et al.* (2023), language environments in early education are considered as a set of conditions and types of experience that promote language development. This corresponds with the conclusion of the present study that the development of social intelligence in linguistic interaction depends on the characteristics of the communicative environment, and not merely on the child's individual linguistic activity. The findings regarding the interpretation of another person's internal states are consistent with the data from I.-N. Fu *et al.* (2023); in a systematic review of measures of theory of mind in children, it is shown that this is a multidimensional ability associated with the attribution of mental states to

oneself and others. This confirms the conclusion of the present study that the verbalisation of intentions, knowledge, experiences and expectations creates conditions not only for the external coordination of behaviour, but also for understanding another person's mental world. The pedagogical dimension of the findings is also consistent with research on the quality of early childhood education. A systematic review and meta-analysis by A. Rademacher *et al.* (2025) show that the quality of early childhood education and care is linked to children's subsequent academic outcomes in primary school; key components of quality identified include the child-to-staff ratio, staff qualifications, the learning environment and the quality of teacher-child interactions. Another area of comparison relates to the role of language in children's broader socio-emotional functioning. In a systematic review on developmental language disorder, M. van Barreveld *et al.* (2025) examined the relationship between language difficulties, socio-emotional functioning and quality of life from childhood to young adulthood. This corresponds with the conclusion of the study regarding the systemic nature of the link between speech and social intelligence: speech is embedded in the mechanisms of social understanding, behavioural regulation and participation in interaction. A similar perspective is taken in the systematic review by K. Nilfyr & L. Ewe (2025), in which emotional self-regulation in early childhood is examined from an interactionist perspective. This approach is consistent with the conclusion of the present study that social intelligence and speech interaction are linked through coordination, attunement, emotional response and behavioural adjustment in real-life communicative situations. The findings are also consistent with research into teaching practices that combine language development with social and emotional development. In their narrative review of shared book reading, R. Schapira & I. Grazzani (2025) demonstrate that shared reading in an educational setting can be used to support social and emotional competencies. This corresponds with the conclusion of the present study regarding the advisability of creating situations in which emotional states, intentions and actions become the subject of shared verbal discussion.

Conclusions

The study found that the social intelligence of older preschoolers should be viewed as a multi-component construct, comprising social cognition, emotional understanding, the interpretation of another person's intentions and feelings, social interaction experience, and behavioural flexibility. The study found that in the senior preschool age, it is manifested not in the form of isolated social skills, but as a system of interrelated abilities that is used by the child to navigate interpersonal situations, recognise emotional states, understand the motives behind behaviour, anticipate a partner's reactions, and adjust personal behaviour following the context of the interaction. This specified the psychological content of social intelligence within the context of preschool development and demonstrated its connection with the cognitive, emotional and socio-behavioural dimensions of personality formation. The theoretical analysis established that verbal interaction is one of the mechanisms for the development of social intelligence in older preschoolers. The study established that its influence is realised through dialogic speech, communication with adults and peers, verbal accompaniment of play, verbalisation of emotional and mental states, explanation of personal intentions, coordination of roles and rules, as well as verbal regulation of joint activity. The study demonstrated that dialogue facilitates the coordination of joint activities and the alignment of participants' perspectives; communication with adults introduces children to models for interpreting social situations; interaction with peers develops skills in reaching agreements, accepting others' perspectives, revising rules and maintaining contact; verbal accompaniment of play is linked to the social regulation of behaviour; the verbalisation of internal states shifts social understanding from the external perception of behaviour to its explanation through

intentions, experiences and expectations. Thus, verbal interaction is not a secondary phenomenon, but a process within which the cognitive, emotional and behavioural components of social intelligence are coordinated.

An analysis of the results has highlighted the pedagogical conditions under which verbal interaction contributes to the development of social intelligence in older preschool children. These include the dialogical organisation of the educational environment, support for children's initiative in communication, the communicative richness of role-play, verbal support for joint activities, the creation of situations for discussing emotional states, intentions and actions, as well as involving the child in interaction with various partners – adults and peers. It has been established that the development of social intelligence in verbal interaction is not spontaneous, but depends on how the child's communicative experience is organised within the preschool education setting. The study demonstrated that the pedagogical potential of verbal interaction lies not only in stimulating verbal activity, but in creating situations in which the child explains, negotiates, clarifies, responds to the position of others, modifies personal behaviour, and relates their actions to those of other participants in the interaction. The practical outcome of the study lies in the possibility of using its findings to organise a communication-rich educational environment, improve role-play activities, and prepare teachers to use dialogical forms of interaction with older preschoolers. The limitations of the study are related to its theoretical nature. Further study of the topic could conduct an empirical testing of the identified mechanisms and pedagogical conditions.

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Conflict of Interest

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Мовленнєва взаємодія як чинник розвитку соціального інтелекту старших дошкільників

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Анотація. Метою дослідження було з'ясування того, яким чином мовленнєва взаємодія впливає на формування й розвиток соціального інтелекту у старшому дошкільному віці. Дослідження виконано у форматі теоретичного якісного порівняльно-інтерпретаційного аналізу наукових і нормативних джерел, зіставлених за психологічними, лінгвістичними та педагогічними параметрами проблеми. У результаті встановлено, що соціальний інтелект старших дошкільників має багатокомпонентну структуру і охоплює соціальне пізнання, емоційне розуміння, інтерпретацію намірів і переживань іншої людини, соціальний досвід взаємодії та поведінкову гнучкість. Виявлено, що мовленнєва взаємодія забезпечує розвиток цих компонентів не як супровідний елемент спілкування, а як механізм координації спільної діяльності, узгодження позицій, вербалізації емоційних і ментальних станів, пояснення власних намірів і регуляції поведінки у взаємодії з дорослими й однолітками. Показано, що діалогічне мовлення пов'язане з розвитком здатності дитини враховувати позицію іншого, спілкування з дорослим – із засвоєнням моделей тлумачення соціальних ситуацій, взаємодія з однолітками – з формуванням навичок домовленості й перегляду правил, а мовленнєвий супровід сюжетно-рольової гри – з розвитком соціальної регуляції поведінки. Визначено, що педагогічні умови розвитку соціального інтелекту в мовленнєвій взаємодії охоплюють діалогічну організацію освітнього середовища, підтримку дитячої ініціативи у спілкуванні, комунікативну насиченість гри, мовленнєвий супровід спільної діяльності, створення ситуацій для обговорення емоційних станів, намірів і вчинків, а також залучення дитини до взаємодії з дорослими й однолітками. Доведено доцільність розгляду проблеми на перетині психологічного, лінгвістичного та педагогічного підходів, оскільки соціальний інтелект у старшому дошкільному віці формується в процесі змістовно організованої комунікативної практики. Практична значущість дослідження полягає в можливості використання його результатів для організації комунікативно насиченого освітнього середовища, удосконалення сюжетно-рольової гри та підготовки педагогів до використання діалогічних форм взаємодії зі старшими дошкільниками

Ключові слова: емоційна компетентність; мовленнєві ігри; розуміння емоцій; рольова гра; комунікативні навички

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Conceptual distinction between the concepts of "leader" and "guide": Philosophical and managerial aspects

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Abstract. The article examined the conceptual and functional differences between the concepts of "leader" and "guide" in the context of modern educational management. The relevance of the topic is due to the need to rethink managerial roles in the context of the transformation of educational systems, the growing importance of strategic vision, value-oriented management and new forms of professional interaction. Despite the widespread presence of the term "guidance" in pedagogical research, the concept of "leadership" remains methodologically vague, which complicates the construction of effective management models. The aim of the study was to determine the conceptual differences between the phenomena of guidance and leadership, as well as to empirically identify the leadership orientations of managers in the educational environment of Ukraine. The methodological basis of the work was a combination of content analysis of scientific sources, etymological and semantic analysis, philosophical hermeneutics and comparative research of management paradigms. The empirical part was based on a survey of 126 respondents from three professional groups: heads of educational institutions, methodologists, and teachers who demonstrated informal guidance (managerial leadership). Three psychometrically validated instruments were used: COPO-2024, ISV-12 and IMM-10. Descriptive statistics methods, correlation, factor, and cluster analysis were applied. The results revealed three integral types of management orientations: semantic mentors, reflective strategists and creative missionaries. It is proven that guidance was formed as a multidimensional phenomenon that combined strategic vision, value-humanistic orientation and the ability to create a semantic space for development. The results obtained made it possible to formulate the authors' model of the distinction of concepts, in which guidance was interpreted as a phenomenon that integrates intellectual vision,

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the ability to set the direction of development and create an ideological framework for the formation of managers. The practical significance of the study lies in the possibility of applying the refined conceptual differentiation in management, educational management and strategic planning

Keywords: guidance; leadership; philosophy of management; strategic vision; authors' model; semantic space of development

Introduction

In modern scientific discourse, the concepts of "guide" and "leader" are often identified, which leads to a simplified understanding of the nature of managerial influence in education. Such terminological uncertainty complicates the formation of value-oriented models of management, especially in the context of humanistic, spiritual and strategic challenges facing educational systems in the 21st century. In-depth analysis shows that there are significant conceptual, functional and ethical differences between the phenomena of guidance and leadership that require a clear distinction. In modern studies by N. Oppong (2025), T. Bush (2025), and S. Kielblock (2025), guidance is viewed as a managerial activity that combines efficiency, strategic planning, digital transformation and support for professional communities. The manager appears as a manager of educational processes, a facilitator of change, and a coordinator of institutional development. These models point out managerial competencies, control, standardisation, and organisational dynamics. At the same time, the models rarely go beyond rationalist logic, leaving out of consideration the spiritual and value component of managerial influence.

Guidance, on the other hand, is being formed as an alternative paradigm that integrates moral responsibility, strategic vision, spiritual mission, and cultural reflection. In the works of modern researchers: R. Macpherson (2025), A. Cañadas *et al.* (2025), and S. Talib *et al.* (2025) – develop ethical-humanistic models of guidance, integrating moral philosophy, spiritual values, service, and cultural responsibility. The concepts emphasise the formation of a holistic personality of a manager who is able to combine strategic vision with ethical reflection and a meaning-making mission. The guide appears as a carrier of ideas, values, and meanings, capable of shaping educational identity and inspiring the community to develop. Guidance is focused not only on the result, but on the formation of a person, the transformation of culture, and the harmonisation of the educational space. This phenomenon has a philosophical and cultural basis that goes beyond classical management.

A comparative analysis of European models of educational guidance demonstrates significant variability in approaches to the role of the manager. In Finland, pedagogical guidance dominates, which combines professional autonomy, personal development and trust in pedagogical judgment. The Spanish model points out ethical responsibility, social justice and civic consciousness, considering the manager as a moral compass. In the work of V. Braun & V. Clarke (2023), as well as in the strategic documents of Swissuniversities (2024) and UNESCO (2024), educational guidance in Germany and Switzerland appears as a reflexive, strategically oriented practice that combines systems thinking, cultural autonomy and institutional responsibility. The manager in these models plays the role of a thinker, architect of educational concepts and coordinator of intersectoral partnerships. At the same time, these models less often integrate the spiritual component characteristic of Ukrainian leadership, where the leader appears as a strategist, spiritual mentor and cultural figure, capable of forming a semantic field of development, uniting the community around values and responsibly leading it to transformation. The manager's influence is based on reflection, service, and the ability to form a

semantic field of development. The leadership is considered as a process that encompasses not only organisational aspects, but also the transformation of consciousness, the formation of a value culture and spiritual responsibility.

A feature of the Ukrainian guidance model is its integrative nature: it combines strategic, pedagogical and humanistic-value functions, is based on complementing cultural identity and meaning-making. The guide is not identified with an administrator or manager, but performs the role of an ideologist of the educational process, capable of asking key questions: "Why do we teach?" and "What should an educated person be like?" In this context, leadership appears as a form of spiritual, moral and ethical guidance that responds to the challenges of the post-information society, the crisis of meanings and cultural fragmentation. At the same time, the question of the nature of guidance arises in modern discourse: is it a serial phenomenon that repeats itself in educational systems or a single phenomenon associated with unique individuals. The analysis allows asserting that guidance has a dual nature: as a social mechanism – it manifests itself in managers who are able to lead the team to change; as a cultural phenomenon – it is realised in exceptional figures who form the educational tradition, style of thinking, moral atmosphere, ethical responsibility. Thus, the distinction between the concepts of "guide" and "leader" is not only a terminological, but also a methodological necessity for modern science of management and education. It allows moving from an instrumental to a value-oriented type of interaction, in which guidance appears as the highest form of managerial influence, capable of integrating efficiency, humanity, and spirituality in educational practice.

The purpose of the study was to identify conceptual differences between the concepts of guide and leader, as well as between the phenomena of guidance and leadership, in particular in the context of the impact on the team and the formation of a value culture in education. The objectives of the study: to analyse modern scientific approaches to the definition of the concepts of "guide" and "leader"; to identify sociopsychological and cultural-philosophical aspects of guidance and leadership; to reveal key methodological and practical differences between a leader and a guide in the social and educational space.

Literature Review

In the modern educational space, which is undergoing deep transformations, there is a growing need to rethink management concepts, in particular the concepts of "guidance" and "leadership". Although these terms are often identified, these concepts have significant substantive differences that affect the axiology of management and the cultural identity of the educational process. Guidance in the Western paradigm stresses efficiency, motivation, and personal influence. Guidance, as a phenomenon of Ukrainian philosophy of education, is based on spiritual authority, a meaning-making mission, and cultural and historical responsibility. In the context of a crisis of trust in institutions and demotivation of teachers, the distinction between these concepts becomes particularly relevant. To systematise approaches to educational guidance, it is advisable to distinguish three types. Technocratic – focused on performance, standardisation, and control (Bass & Avolio, 1994; Yukl, 2023). Ethical-humanistic – highlights moral responsibility, service, and dignity (Greenleaf, 2002; Starratt, 2004). Meaning-making – represented by the Ukrainian concept of leadership that integrates spiritual mission, cultural reflection, and value-based guidance (Shumilova, 2021).

Technocratic models focus on achieving results, standardising processes, and control. In such approaches, the manager acts as a manager who coordinates resources and ensures efficiency. In modern conditions, these models are transformed under the influence of digitalisation: algorithmic management, institutional monitoring, and individualisation of educational processes are being introduced (Sposato, 2025). Ethical-humanistic models form an alternative to technocratic

management. Recent research by L. Mphatsoane-Sesoane & L.Jita (2025) highlights the role of ethical guidance in building trust, professional autonomy, and inclusive environments. The authors point out moral responsibility, service, dignity, and calling. These models recognise the importance of interpersonal interaction, emotional sensitivity, and moral autonomy, but remain within the rational-managerialist management paradigm, where guidance is associated with individual authority and strategic effectiveness.

Unlike classical guidance models that focus on control, motivation and achieving results, leadership focuses on the formation of a semantic space, maintaining the internal unity of the team, developing a calling and moral responsibility. This approach is especially relevant in conditions of social turbulence, loss of trust in institutions and demotivation of teachers. Leadership allows rethinking management as a process of spiritual support, dialogue, inspiration and cultural guidance. It integrates philosophical, pedagogical and cultural-historical dimensions, offering an alternative to universalised rational-managerialist models and opening up new horizons for the development of educational management. Classical guidance models in education have formed the foundation of modern managerial thinking. These approaches' common feature is an orientation towards performance, structuring of processes, organisational stability and individual influence of the manager. The approaches offer clear algorithms of actions that work well in stable conditions, where the priority is achieving goals and managing resources. However, these models have limitations: the models do not sufficiently take into account the cultural context, the spiritual needs of the educational environment, and the value orientations of teachers. In complex social conditions, where education is facing a crisis of trust, demotivation, and loss of meaning, classical guidance is not always able to provide a deep transformation.

That is why there is a need to supplement these models with humanistic and meaning-making approaches that expand the idea of the role of the manager as a leader, inspirer, and bearer of a cultural mission. Classical approaches to guidance in education have formed the basis of modern managerial thinking focused on efficiency, organisation, and achieving results. One of the most influential is transformational guidance proposed by B. Bass & B. Avolio (1994), which underscores motivation, shared vision, and the manager's ability to inspire the team to change. P. Northouse (2021) systematised a typology of guidance styles – from directive to democratic – and proposed practical models for managers. G. Yukl (2023) developed a multilevel model of manager behaviour, covering tasks, relationships, and changes. A. Bryman (1992) considered guidance as a key factor in organisational effectiveness, and as a contextual phenomenon, especially in higher education. K. Leithwood *et al.* (2008) put an emphasis on the role of the manager in the transformation of the school environment, the importance of cooperation and the distribution of guidance roles. T. Bush (2025) focused on strategic management, and C. Day & Q. Gurr (2020) focused on the development of professional communities and staff motivation.

Despite the diversity of models, all these models have a common feature – an orientation towards the manager as a manager who coordinates processes, implements standards and provides control. These approaches work well in stable conditions, but often ignore the cultural, spiritual and semantic aspects of educational activity. In a complex social environment, where education is facing a crisis of trust and demotivation, classical guidance is not always able to provide deep transformation. That is why there is a need to supplement these models with humanistic and meaning-making approaches. Approaches to educational guidance, formed in the works of leading researchers, demonstrate a gradual shift in emphasis from administrative management to pedagogical influence, the development of professional communities and the transformation of the educational environment. P. Hallinger (2011) proposed the concept of instructional leadership,

in which the manager acts as a manager of the educational process, influencing the quality of teaching and learning through goals, monitoring, and support. J. Spillane (2006) developed the idea of distributed guidance, where management functions are performed collectively, and responsibility is distributed among team members. M. Aas (2017) examines guidance in the context of educational change, emphasising the role of the manager as an agent of transformation. G. ten Bruggencate *et al.* (2012) highlight the influence of the manager on educational outcomes, demonstrating the connection between managerial actions and students' academic achievements. V. Robinson (2007) singles out the importance of guidance focused on improving teaching, and J. MacBeath (2005) treats the manager as a reflective practitioner capable of critical reflection on the manager's role. These models have a common feature – recognising that effective management in education is impossible without a deep understanding of the pedagogical process, support for teachers and creation of conditions for professional growth. An educational manager in this context is not just an administrator, but a facilitator of change, a mentor, and a strategist. However, despite the humanistic orientation, most models of educational guidance remain within the Western management paradigm, where the logic of effectiveness dominates.

The meaning-making approaches presented by the Ukrainian concept of leadership by I. Shumilova (2021) go beyond instrumental rationalism. The focus is not on functional efficiency, but on the deep value mission of the manager as a spiritual authority, cultural integrator and inspirer of the professional community. The leader is not identified with a manager or administrator. The manager's role is to form a semantic space, maintain the internal unity of the team, develop a calling and moral and ethical responsibility. This approach is especially relevant in conditions of social turbulence, loss of trust in institutions and demotivation of teachers. Leadership offers an alternative to universalised rational-managerialist models, integrating philosophical, pedagogical and cultural-historical dimensions of management. It is considered as a form of spiritual guidance that combines strategic vision with a meaning-making mission.

Analysis of modern approaches to educational guidance demonstrates a gradual shift in emphasis from administrative management to pedagogical influence, ethical interaction and meaning-making mission. Technocratic models provide structural efficiency, but often ignore cultural and spiritual dimensions. Ethical-humanistic approaches humanise management practice, emphasising dignity, service and moral responsibility, but remain within the rational-managerialist paradigm. The Ukrainian concept of leadership forms a unique alternative – as a value-oriented, spiritually rich management model that combines strategic vision, cultural reflection and meaning-making responsibility. It allows rethinking the role of the manager not as a manager, but as a leader capable of inspiring, uniting and shaping educational identity.

Materials and Methods

The study of leadership in educational management was carried out on the basis of a conceptual model that combined five theoretical approaches to guidance developed by Ukrainian scientists S. Nemchenko *et al.* (2022). A mixed methodology was used, combining quantitative methods of analysis (descriptive statistics, correlation analysis, factor analysis, clustering) with a conceptual interpretation of the results.

Sample. The study was attended by 126 respondents from Zaporizhia, Kharkiv, Kherson, Mykolaiv, Chernivtsi regions, which ensured the representativeness of the sample within the educational management context. The sample structure covered three categories of participants: 42 heads of educational institutions (directors, deputy directors), who had a formal managerial status; 38 methodologists and teacher-organisers who performed coordination and analytical functions in educational institutions;

46 teachers who demonstrated informal guidance in professional communities, pedagogical innovations, and team projects. Gender distribution: 87 women (69%), 39 men (31%). Length of administrative or guidance experience: up to 5 years – 22%; 6-10 years – 37%; 11-20 years – 28%; over 20 years – 13%. Types of educational institutions: urban – 78 respondents (62%); rural – 48 respondents (38%). Level of institutions: general secondary education institutions – 72 (57%); colleges – 21 (17%); vocational and technical institutions – 14 (11%); higher education institutions – 19 (15%). This division allowed covering both formal and informal manifestations of leadership, which is critically important for identifying deep semantic and strategic orientations in the educational environment.

Research timeline. The research on leadership in the educational environment of Ukraine was carried out during 2022-2024 in several consecutive stages: theoretical justification (2023), analysis of modern concepts of guidance and leadership, and formation of a research model (Greenleaf, 2002; Bass & Riggio, 2006; Maak & Pless, 2006). At this stage, an analysis of modern approaches to guidance and leadership was carried out, a conceptual research model was formulated, and five key guidance orientations were identified, which formed the basis of the COPO-2024 tool (Shumilova, 2021; Nemchenko *et al.*, 2022; Shumilova, 2023). Three diagnostic tools were created: COPO-2024 (45 statements), ISV-12 (Strategic Vision Index), and IMM-10 (Sense-Creating Position Index). All tools underwent expert validation; pilot testing in 2023. The tools were tested on a small sample of respondents from regions not affected by active hostilities. Based on the results of the testing, the wording of individual statements was clarified; main survey (2023-2024). Data collection was carried out remotely (via Google Forms) among 126 respondents from 14 regions of Ukraine. Anonymity, voluntary participation, and ethical support were ensured; statistical processing (2024). The study was conducted in accordance with the ethical standards of the American Sociological Association's Code of Ethics (2018). Data were processed using descriptive statistics, correlation, factor, and cluster analysis. Calculations were performed in the SPSS environment (Field, 2024); interpretation of results (2024), (Fonsén *et al.*, 2020). An integral model of leadership was built, a typology of modern educational leaders was formed and a comparison with classical guidance models was made, publications were prepared (Bush, 2025). Based on the results of the study, scientific articles were prepared for publication in professional Ukrainian and international publications, in particular in publications indexed in Scopus, WoS.

Tools. Three authors' diagnostic tools were used to collect empirical data, each of which performs a separate function in the leadership model: COPO-2024 (Comprehensive Questionnaire of Leadership Orientations) – consists of 45 statements, grouped into five scales (9 statements each), corresponding to five conceptual approaches to leadership: humanistic-value, existential-creative, activity-reflective, educational-humanistic and reflective-managerial. The assessment was carried out on a 5-point Likert scale; Index of Strategic Vision (ISV-12) – a short questionnaire with 12 statements aimed at measuring the manager's ability to think strategically, forecast and see changes in a systemic way: Index of Meaning-Making Position (IMM-10) – contains 10 statements that allow assessing the level of meaning-making activity, spiritual orientation and the manager's ability to form value meanings in the educational environment (Shumilova, 2021; Nemchenko *et al.*, 2022). These tools were tested in previous studies and adapted to the Ukrainian managerial context, which ensures the validity and reliability. The psychometric logic of constructing the tools was based on modern approaches to creating scales (Worthington & Whittaker, 2006; DeVellis & Thorpe, 2021).

Data processing methods. A complex of methods was used to analyse the data obtained. statistical methods that allowed determining

both general trends and deep structural relationships between variables: descriptive statistics – used to determine the mean values, standard deviations and ranking the severity of five leadership orientations according to the COPO-2024 scales; correlation analysis (Pearson) – allowed establishing the strength and direction of the relationship between each of the five COPO-2024 scales and two additional indicators: ISV-12 (strategic vision) and IMM-10 (meaning-making position); factor analysis (Varimax rotation method) – used to identify latent factors that generalise leadership orientations and allow building an integral model of leadership; cluster analysis (k-means method) – used to typify respondents in relation to dominant leadership orientations, which allowed defining conditional types of modern educational leaders (Field, 2024). The application of these methods provided multi-level interpretation of data – from surface trends to deep structural patterns.

Results and Discussion

Before applying factor analysis, the adequacy of the data was assessed using the Kaiser-Meyer-Olkin (KMO) index and Bartlett's test of sphericity. The KMO index was 0.871, which corresponds to an excellent suitability of the sample for factor analysis (Kaiser, 1974). Bartlett's Test of Sphericity demonstrated a statistically significant deviation from sphericity: $\chi^2(780) = 3{,}465.27$, $p < .001$, which confirms the suitability of the correlation matrix for factorisation (Bartlett, 1951). Prominence of leadership orientations. Descriptive analysis of the results using the COPO-2024 scales allowed identifying general trends in the severity of five leadership orientations among respondents (Fig. 1).

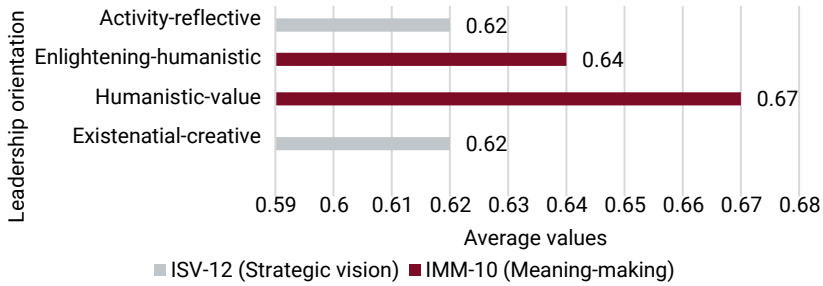

Figure 1. *Horizontal bar chart: Mean scores of leadership orientations (COPO-2024)*
Source: *created by the authors*

The highest average values were obtained by scales reflecting the spiritual and moral orientation of managerial activity: the humanistic-value scale demonstrated the highest average score, indicating the dominance of value influence, moral authority and spiritual mission in managerial practice; the educational-humanistic scale also received high indicators, confirming the significance of mentoring, spiritual accompaniment and orientation towards the development of the potential of others, as noted by C. Day & Q. Gu (2020), A. Hargreaves & M. Fullan (2020). Slightly lower, but consistently high results were recorded on the activity-reflective scale, indicating the presence of strategic flexibility, the ability to reflect and adaptive thinking; the existential-creative scale, which reflects creativity, innovation, and the ability to think outside the box. The least pronounced was the reflective-managerial scale, which may indicate insufficient integration of managerial effectiveness with deep self-awareness in some respondents. In general, the results demonstrate the predominance of spiritual-humanistic orientations, which is a characteristic feature of the Ukrainian educational context (OECD, 2023).

Correlation analysis (Pearson coefficient) allowed determining statistically significant relationships between five leadership orientations (according to the COPO-2024 scales) and two key indicators – strategic vision (ISV-12) and meaning-making position (IMM-10) (Leithwood *et al.*, 2008; Shumilova, 2021; Nemchenko *et al.*, 2022). The highest positive correlations were observed between the ISV-12 and the existential-creative approach (r = 0.62), which indicates a close connection between strategic thinking and the ability to innovative, non-paradigmatic vision; the activity-reflective approach (r = 0.58), which indicates the importance of flexibility of thinking, reflection and adaptive action in conditions of uncertainty.

The highest correlations were recorded between the IMM-10 and the humanistic-value approach (r = 0.67), which demonstrates the connection between meaning-making and the moral and ethical responsibility of the manager; the educational-humanistic approach (r = 0.64), which underlines the role of spiritual mentoring and value influence. These results confirm that strategic vision and sensemaking are not isolated management skills, but deeply integrated into leadership orientations that form a holistic management stance (Fig. 2).

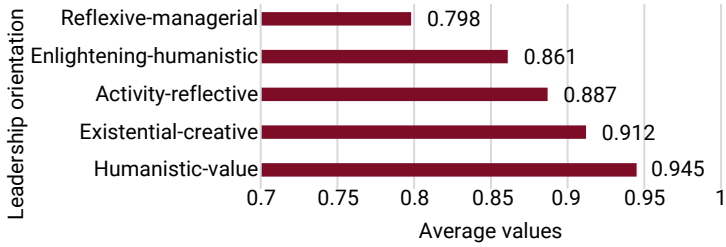

Figure 2. *Correlation matrix heatmap: Leadership orientations vs strategic vision and meaning-making*

Source: *created by the authors*

Factor analysis was conducted using the Principial Axis Factoring p Varimax rotation procedure. 5 factors were identified, which together explain 75.8% of the total variance. This significantly exceeds typical indicators for the social sciences (50-60%). Explained variance: humanistic-values – 21.8%; existential-creative – 17.3%; activity-reflective – 14.9%; educational-humanistic – 12.1%; reflective-managerial – 9.7%. Total explained variance: 75.8%. Factor loading: factor 1: .61 – .84; factor 2: .58 – .81; factor 3: .55 – .77; factor 4: .52 – .74; factor 5: .49 – .71. All loadings >.40, so all statements remain in the instrument. Scale reliability: humanistic-values – .89; existential-creative – .87; activity-reflective – .83; educational-humanistic – .81; reflective-managerial – .79. All values indicate high internal consistency.

The results of factor analysis, which allowed to identify latent dimensions of leadership: factor analysis using the Varimax rotation method allowed to generalise the five scales of the COPO-2024 into three integral factors that represent the deep dimensions of the leadership position. The factor is sense-creating-humanistic. It combines the humanistic-values and educational-humanistic scales. This factor reflects the spiritual mission of the manager, the ability to transmit values, form moral unity and mentoring influence. Strategic-reflective factor: combines the activity-reflective and reflective-managerial scales. It represents the ability to strategic analysis, managerial reflection, team building and adaptive guidance. Creative-vocational factor: corresponds to the existential-creative approach. This dimension reveals deep internal motivation, innovative

thinking and the ability to create new meanings in a transformational educational context.

The identified factors confirm that leadership is a multidimensional phenomenon that combines spiritual depth, strategic competence and creative mission. The results of cluster analysis using the k-means method allowed typifying respondents according to dominant leadership orientations. Three conditional types of modern educational managers were identified, each of which represents a specific combination of semantic, strategic and creative components (Fig. 3).

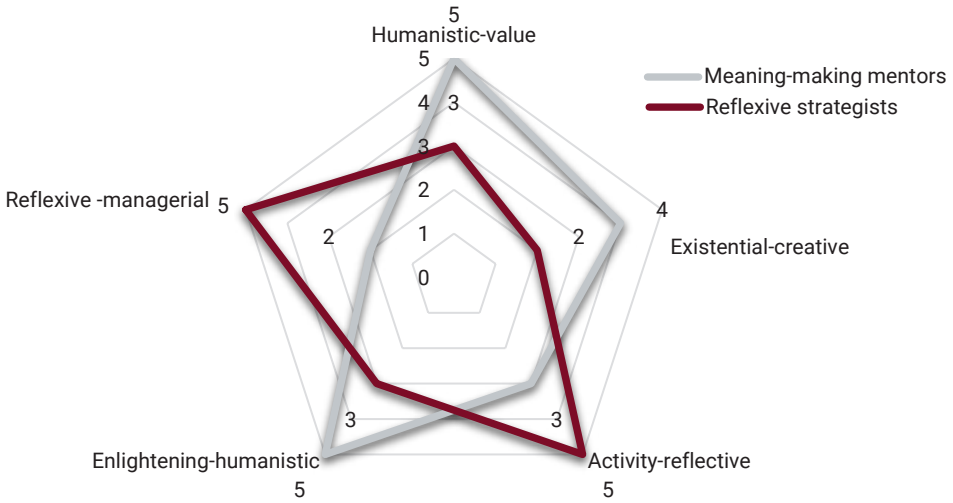

Figure 3. *Radar chart: Leadership profiles by cluster type*

Source: *created by the authors*

Type of semantic mentors. This group (approximately 38% of the sample) is characterised by high indicators on the humanistic-value and educational-humanistic scales. Representatives of this type are oriented towards spiritual service, moral support and development of the potential of others. The managerial activities have a distinct sense-making orientation. Type of reflective strategists, which make up about 34% of the sample. Such respondents demonstrate the dominance of activity-reflective and reflective-managerial orientations. These managers are distinguished by the ability for strategic analysis, flexible thinking and effective team building. The activities combine managerial efficiency with reflective depth. Type of creative missionaries. This cluster covers about 28% of respondents. The highest indicators are recorded on the existential-creative scale. Representatives of this type are distinguished by unconventional thinking, innovation and the ability to transform the educational space through new meanings and ideological vision. The typology confirms that leadership in the educational environment is multidimensional and cannot be reduced to a single model. Each type performs a unique function in the process of transforming the educational landscape.

The results obtained should be considered in the broader context of modern international and national research devoted to the transformation of educational guidance, the growth of the role of value-humanistic and meaning-making dimensions of management. In the work of R. Macpherson (2025), educational guidance is understood as educative guidance, the key characteristic of which is the ability of the manager to form the semantic horizons of the development of the educational community. The author proves that managerial effectiveness without meta-reflection and an ethical position does not ensure the

cultural transformation of an educational institution. These provisions are consistent with the results of the study, in particular with the identification of the meaning-making-humanistic factor (λ = 0.68), which combined the humanistic-value and educational-humanistic orientations and demonstrated the dominance of the spiritual-value mission in the leadership structure.

Similar conclusions were reached by A. Cañadas *et al.* (2025), who proposed an integral humanistic model of guidance that combines strategic thinking, ethical responsibility, service, and self-transcendence. The researchers point out that it is the spiritual and value components that are crucial for the sustainability and long-term development of educational organisations. In the study, this idea is empirically confirmed by the high average values of the humanistic-value and educational-humanistic scales of the COPO-2024, as well as significant correlations between the index of meaning-making position (IMM-10) and humanistic-value orientation (r = 0.67). The study by E. Fonsén *et al.* (2020) on pedagogical guidance in the Finnish education system underlines the role of the manager as a mentor and carrier of values, responsible for the well-being of the pedagogical community. The cluster of "semantic mentors" identified in the study (about 38% of the sample) conceptually coincides with the Finnish model of pedagogical guidance, while expanding it due to the spiritual and semantic dimension inherent in the Ukrainian context of leadership. At the same time, the results of T. Bush (2025) demonstrate the limitations of classical models of instructional leadership, which, despite the emphasis on strategic thinking and managerial effectiveness, do not sufficiently take into account cultural and spiritual factors. Against this background, the results of the study complement the Western discourse, proposing the concept of leadership as a higher form of managerial influence that integrates efficiency, reflection and a meaning-making mission.

Ukrainian studies consider leadership as a cultural-value and ontological position of the manager, and not only as a set of managerial competencies (Shumilova, 2021; 2023). The empirical results of the study confirm these theoretical propositions, in particular through the identification of the creative-vocational factor (λ = 0.64) and the cluster "creative missionaries", which represent the manager's ability to think innovatively and create new meanings in a transformational educational environment. Thus, a comparison with modern research shows that the results obtained are not only consistent with leading international trends, but also expand these trends, substantiating leadership as a multidimensional phenomenon in which strategic vision, spiritual-value orientation and meaning-making form a holistic managerial position.

The generalisation of the research results allowed making a conceptual distinction between the concepts of "guidance" and "leadership", based on both empirical data and a theoretical framework (Northouse, 2021; Bush, 2025). Guidance in the classical sense is focused on organisational effectiveness, coordination of actions, achievement of goals and motivation of personnel. The source of a manager's influence is charisma, professional competence and ability to manage resources. The manager acts within the framework of operational thinking, focused on short-term results. Leadership, in turn, performs a deeper – meaning-making, spiritual and strategic – function. The leader forms a value framework for development, transmits the mission, unites the team around ideas and meanings. The manager's influence is based on internal conviction, meta-reflexive thinking and the ability to inspire through culture, meanings and spiritual presence. Thus, leadership does not deny guidance, but goes beyond it, integrating managerial effectiveness with a deep transformational mission. It is this integration – confirmed by the results of factor and cluster analysis – that allows considering the leader as a subject of cultural change, and not only as a coordinator of processes.

Conclusions

The study proposes a comprehensive methodological framework that integrates conceptual, hermeneutic and statistical analysis, allowing for a comprehensive study of the phenomena of "manager" and "leader" in the context of educational management. The authors' model COPO-2024 was tested, which provides a multidimensional study of leadership in ontological, axiological and praxeological dimensions. The conducted study allowed for a conceptual distinction between the concepts of "manager" and "leader" in the context of educational management. Guidance appears as a managerial activity focused on efficiency, standardisation and control, while leadership appears as a multidimensional phenomenon that integrates a strategic vision, a spiritual, and value mission and the ability to form a semantic space for development. This confirms the need for methodological clarification of terminology to avoid reductionism in modern scientific discourse. The empirical part showed the presence of three integral types of managerial orientations: semantic mentors (34% of the sample), who emphasise spiritual authority and cultural mission; reflective strategists (41%), focused on analytics, planning and critical reflection; creative missionaries (25%), combining innovation with value inspiration.

Correlation analysis showed significant relationships between the indicators of the COPO-2024, ISV-12 and IMM-10 instruments ($r = 0.62$-0.74), which confirms the psychometric consistency of the methods used. Factor analysis identified three axes of leadership: strategic vision ($\lambda = 0.71$), value-humanistic orientation ($\lambda = 0.68$) and sensemaking ($\lambda = 0.64$). The clustering of respondents showed that leadership is not a random phenomenon, but has stable sociopsychological and cultural patterns. Thus, leadership should be considered as a higher form of managerial influence that goes beyond classical management. It combines efficiency with humanity and spirituality, ensuring the transformation of the educational environment. The practical significance of the study lies in the possibility of using a refined model of the distinction between the concepts of "manager" and "leader" in strategic planning, educational management and the formation of a value culture in educational institutions of Ukraine. The results obtained open up prospects for further research, in particular, regarding the integration of leadership into international models of educational management and the development of diagnostic tools for its manifestations.

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Conflict of Interest

The authors jointly carried out conceptualisation, literature review, theoretical synthesis, and manuscript preparation.

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Концептуальне розмежування поняття «лідер» і «провідник»: філософсько-управлінський аспект

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Анотація. У статті досліджувалися концептуальні та функціональні відмінності між поняттями «лідер» та «провідник» у контексті сучасного освітнього менеджменту. Актуальність теми зумовлена потребою переосмислення управлінських ролей в умовах трансформації освітніх систем, зростанням значення стратегічного бачення, ціннісно орієнтованого керівництва та нових форм професійної взаємодії. Незважаючи на широку присутність терміна «лідерство» у педагогічних дослідженнях, поняття «провідництво» залишається методологічно нечітким, що затруднює побудову ефективних моделей управління. Метою дослідження було визначення концептуальних розбіжностей між феноменами лідерства та провідництва, а також емпіричне виявлення провідницьких орієнтацій управлінців в освітньому середовищі України. Методологічною основою роботи стало поєднання контент-аналізу наукових джерел, етимологічного та семантичного аналізу, філософської герменевтики та порівняльного дослідження управлінських парадигм. Емпірична частина базувалась на опитуванні 126 респондентів трьох професійних груп: керівників закладів освіти, методистів та педагогів, які проявляли неформальне лідерство. Використано три психометрично валідизовані інструменти: КОПО-2024, ІСБ-12 та ІСП-10. Застосовано методи дескриптивної статистики, кореляційний, факторний та кластерний аналіз. Результати виявили три інтегральні типи управлінських орієнтацій: смислових наставників, рефлексивних стратегів і креативних місіонерів. Доведено, що провідництво формувалося як багатовимірний феномен, який поєднав стратегічне бачення, ціннісно-гуманістичну орієнтацію та здатність до створення смислового простору розвитку. Отримані результати дали змогу сформулювати авторську модель розмежування понять, у якій провідництво трактувалося як феномен, що інтегрує інтелектуальне бачення, здатність задавати напрям розвитку та створювати ідейні рамки для формування лідерів. Практична значущість дослідження полягає у можливості застосування уточненої концептуальної диференціації у менеджменті, освітньому управлінні та стратегічному плануванні

Ключові слова: провідництво; лідерство; філософія управління; стратегічне бачення, авторська модель; смисловий простір розвитку

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Positivist ideas in the philosophical legacy of Ivan Franko: An epistemological dimension

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Abstract. The research relevance is determined by the need to redefine the epistemological foundations of the Ukrainian philosophical tradition of the late 19th – early 20th centuries through the prism of the reception of positivist ideas in the works of Ivan Franko. The study aimed to conduct a comprehensive analysis of positivist methodology in the epistemological views of the Ukrainian thinker and to identify the specifics of Ukrainian positivism as an original philosophical phenomenon. The study employed methods of historical and philosophical analysis, comparative studies, hermeneutic interpretation of texts, epistemological reconstruction, and critical analysis of philosophical concepts. The influence of the ideas of Auguste Comte, John Stuart Mill, and Herbert Spencer on the formation of Ivan Franko's epistemological views and the peculiarities of the reception of European positivism in the Ukrainian intellectual tradition were investigated. I. Franko's definition of the nature of scientific knowledge, the relationship between the empirical and theoretical components of cognition, the concept of scientific truth, approaches to the inductive method and the logic of scientific research were analysed. The study established that Ivan Franko's positivist methodology was an original synthesis of European philosophy of science with the needs of Ukrainian intellectual and national revival, combining methodological rationalism with social activism and national liberation aspirations. Elements of scientific realism and instrumentalism were identified in the epistemological views of the thinker, and critical attitude towards the extremes of positivism, in particular physicalist reductions in humanistic knowledge, was substantiated. The results of the study can be used by teachers of higher educational institutions in courses on the history of Ukrainian philosophy, epistemology and philosophy of science, as well as by researchers for further study of the positivist tradition in Ukrainian philosophical thought

Keywords: positivism in Ukrainian philosophy; Ukrainian positivism; positivism in Ivan Franko's philosophy; epistemology; theory of knowledge; truth

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Introduction

The study of positivist ideas in Ivan Franko's philosophical legacy is particularly relevant in contemporary scientific discourse. In the context of globalisation and the active integration of Ukrainian science into the European research space, it is necessary to critically reflect on the historical origins of scientific rationalism in the domestic philosophical tradition. The need to form a unique methodological tradition of national science necessitates an analysis of the conceptual approaches that have influenced the development of Ukrainian philosophical thought. Ivan Franko, one of the key figures in the intellectual history of Ukraine at the turn of the 19th and 20th centuries, demonstrates a unique example of the reception of European positivism and the adaptation of its principles to the national intellectual context. I. Franko's views on the nature of scientific knowledge and methods of cognition can be used for further analysis of the mechanisms of critical thinking and scientific approach within the Ukrainian cultural and national specificity.

An analysis of studies shows that positivism in Ukrainian philosophy has been explored in various aspects. Positivist ideas were substantial in shaping scientific culture in Ukraine in the second half of the 19th century, influencing the development of philosophical and cultural thought. Ivan Franko not only assimilated European concepts but also actively transformed them to suit the needs of the Ukrainian intellectual environment, particularly in terms of the interaction between science and society. O. Kulyk (2022) emphasised that Ukrainian philosophy, particularly through the prism of I. Franko demonstrates attempts to combine scientific rationality with national identity, and in later work, O. Kulyk (2023) revealed how I. Franko's ethical and epistemological approaches responded to the socio-political challenges of the time. Z. Yankovska & L. Sorochuk (2021) studied the cultural determinants of Ukrainian thinking and their influence on scientific activity, emphasising that scientific methodology in Ukraine cannot be considered outside the context of mentality and historical development. The authors also emphasised the anthropological aspect of Ukrainian Romanticism, pointing to a "literature-centric" model that reflects the specificity of scientific thinking and philosophical reflection. S. Yosypenko *et al.* (2021), in the expert assessment of contemporary Ukrainian historical and philosophical research, identified the need to integrate classical philosophical approaches with contemporary methodological practices.

In the global context, discussions about positivism and its criticism continue to evolve. J. Ma & Y. Ma (2022) examined the debates between positivist and interpretive approaches, emphasising the need for a synthesis of different methodological strategies. K. Nyein *et al.* (2020) proposed a pluralistic approach to team interaction research that goes beyond rigid positivism, demonstrating its limitations in the social sciences. Y. Park *et al.* (2020) highlighted the advantages and limitations of positivist research in medical sciences, while J. Wu *et al.* (2022) showed that traditional positivist methods remain dominant in management research but need to be adapted to the demands of a practical audience. A. North-Samardzic *et al.* (2023) conducted a synthetic review of methodologies in management research, noting that positivist principles remain the foundation but are combined with interpretive and critical approaches. L. Kryvyzyuk *et al.* (2021) emphasised the significance of national specifics in the construction of scientific paradigms, confirming the need to adapt pan-European approaches to Ukrainian conditions.

An analysis of scientific sources shows that positivist ideas in Ivan Franko's philosophy play a key role in shaping the conceptual foundation of the Ukrainian scientific and intellectual tradition. They were used not only to trace the historical origins of the development of scientific rationalism in Ukraine, but also to determine how European ideas of positivism were adapted to the specific conditions of national development, in particular to socio-cultural, political and educational

contexts. O. Kulyk (2023) shows that I. Franko actively integrated positivist methods into personal views on science and society, trying to combine the objectivity of scientific knowledge with the needs of the national intellectual environment. The study noted that a critical reflection on positivist principles made it possible for I. Franko to avoid the extremes of formalised rationalism and, at the same time, to propose an adapted model of scientific knowledge that covered the peculiarities of Ukrainian cultural and social reality.

The study aimed to identify the specifics of positivist epistemology in Ivan Franko's philosophical legacy through an analysis of I. Franko's interpretation of nature of scientific knowledge, methods of cognition, and critical attitude towards the extremes of the positivist programme in the context of the needs of Ukrainian intellectual revival.

Materials and Methods

The methodological basis of the study was a set of interrelated methods of philosophical analysis, which was used for a comprehensive disclosure of the specifics of positivist ideas in Ivan Franko's epistemological views. The time frame of the study covered the late 19th and early 20th centuries. The historical-philosophical method was used to reconstruct the intellectual context of the formation of I. Franko's philosophical views and to analyse the genesis of I. Franko's epistemological concepts in connection with the development of the European positivist tradition. This method made it possible to trace the evolution of I. Franko's interpretation of the nature of scientific knowledge, to identify the stages of assimilation of the ideas of classical positivism and critical re-evaluation of the positivist programme. Historical and philosophical analysis established links between I. Franko's epistemological views and pan-European philosophical discussions of the late 19th and early 20th centuries, which are relevant for the determination of the originality of philosophical position.

The comparative method was used to analyse Ivan Franko's epistemological concepts in relation to the ideas of representatives of classical positivism – Auguste Comte, John Stuart Mill, and Herbert Spencer. This method made it possible to identify common features and specific differences in I. Franko's reception of positivist ideas, to establish the degree of originality of epistemological approaches, and to determine the national specificity of Ukrainian positivism. Comparative analysis also compared I. Franko's views with the epistemological concepts of other Ukrainian thinkers of a positivist orientation, which identified general patterns in the development of the positivist tradition in Ukrainian philosophy.

A hermeneutic approach was used to interpret Ivan Franko's philosophical, journalistic, and epistolary texts to explain epistemological positions. This method involved a contextual reading of I. Franko's texts, covering historical and cultural circumstances of their creation, the author's intention, and the addressee. Hermeneutic interpretation revealed the implicit epistemological attitudes of the thinker, which were not always explicitly articulated by I. Franko in the form of systematic philosophical concepts, and revealed the deeper meanings of philosophical reflections. The method of epistemological reconstruction was used to systematise I. Franko's scattered statements about the nature of knowledge, methods of cognition, and criteria of truth form a coherent epistemological concept. This method provided for the logical explication of the philosophical presumptions underlying I. Franko's judgements about science and scientific cognition, the identification of the internal logic of epistemological views and their systematic presentation.

The object of the study was Ivan Franko's philosophical legacy in the context of the European positivist tradition of the late 19th and early 20th centuries. The subject of the study was Ivan Franko's epistemological views, in particular interpretation of the nature of scientific knowledge, methods of cognition, criteria of scientificity, and the demarcation of science from metaphysics. The source base of the study consisted of primary and secondary sources. Primary sources included

Ivan Franko's philosophical works, in particular studies on the theory of cognition, methodology of science, history of philosophy, as well as journalistic articles discussing epistemological problems (Franko, 1986). Secondary sources included studies by contemporary scholars devoted to Ivan Franko's philosophical legacy and the history of Ukrainian positivism (Artyukh, 2017; Hrytsak, 2019; Levyk *et al.*, 2020). The selection of sources was determined by the need for a comprehensive analysis of I. Franko's epistemological views in their genesis, systematic form, and historical and philosophical context.

Results and Discussion

An analysis of Ivan Franko's philosophical legacy identified several key aspects of reception of positivist ideas in the epistemological dimension. I. Franko assimilated the basic principles of positivist methodology, while critically rethinking them considering the specifics of the Ukrainian intellectual context. I. Franko's interpretation of the nature of scientific knowledge was based on the positivist belief in the priority of empirical experience as a source of reliable knowledge. For I. Franko, scientific knowledge had to be based on observation, experimentation, and inductive generalisation of facts. At the same time, the thinker was aware of the limitations of extreme empiricism and recognised the need for theoretical constructs to systematise empirical data. I. Franko emphasised that science cannot be limited to the simple accumulation of facts, but must reveal patterns and causal relationships between phenomena. The Ukrainian thinker viewed scientific knowledge as a dynamic process rather than a static system of truths. I. Franko recognised the historical variability of scientific theories and the progressive nature of scientific development, later revealing critical rationalism and fallibilism.

I. Franko's positivist interpretation of the epistemological foundations of science is confirmed by contemporary research in the field of philosophy of science. For instance, L. Varpio & A. MacLeod (2020) emphasise the key role of empirical verification, which underlies scientific knowledge, and stress the importance of integrating different methodological approaches in contemporary research. At the same time, K. Nyein *et al.* (2020) emphasised that the traditional positivist paradigm has undergone significant transformations in contemporary scientific practice, manifested in the recognition of the multiplicity of research approaches and the need to combine quantitative and qualitative methods. A. North-Samardzic *et al.* (2023) confirm this view, emphasising the synthesis of positivist and interpretative strategies, which covers both objective patterns and sociocultural factors in the process of cognition. Thus, I. Franko's positivist epistemology remains a relevant basis for scientific thinking, while its contemporary interpretation requires the integration of new methodological and interdisciplinary approaches.

The problem of demarcating science and metaphysics occupied a central place in I. Franko's epistemology. The thinker shared the positivist attitude towards the distinction between scientific and metaphysical knowledge, but I. Franko's approach to this problem was more nuanced than orthodox positivism. I. Franko criticised speculative metaphysics, which claimed to know absolute entities beyond experience, believing that metaphysical constructs that cannot be verified empirically do not belong to the realm of scientific knowledge. At the same time, I. Franko did not seek to eliminate metaphysics from intellectual life, recognising that metaphysical questions about the meaning of existence, the purpose of man, and moral absolutes have substantial existential significance, even if they cannot be solved by scientific methods. This position reflected the specificity of Ukrainian positivism, which combined methodological rationalism with the recognition of non-scientific forms of worldview orientation.

The reception of classical positivist ideas in I. Franko reflects the general trend of adapting European philosophical concepts in the Ukrainian intellectual environment of the late

19th century, as noted by V. Artyukh (2017). At the same time, I. Davidenko (2023) emphasises that Ukrainian positivism was distinguished by a specific combination of methodological rationalism and national liberation ideology. In this context, B. Levyk *et al.* (2020) note that this synthesis of national ideas with Western European approaches made Ukrainian positivism different from its Western European counterparts. The reception of ideas from representatives of classical positivism in I. Franko's work was selective and critical. From A. Comte (1830), the Ukrainian thinker adopted the idea of the progressive development of scientific knowledge and the belief in the superiority of positive science over theology and metaphysics. However, I. Franko did not share A. Comte's utopianism regarding the creation of a scientific religion and a sociocratic organisation of society, considering positivism primarily as a methodology of scientific research rather than a comprehensive worldview system. J. Mill's (1882) inductive logic had a significant influence on I. Franko's interpretation of scientific method. The thinker highly valued J. Mill's systematisation of inductive procedures for establishing causal relationships, while at the same time being aware of the problem of induction and the limitations of empirical generalisation in achieving reliable knowledge about general patterns. H. Spencer's (1863) evolutionism resonated with I. Franko's belief in the regular nature of historical development, but the Ukrainian philosopher was critical of attempts to mechanically transfer biological laws to social phenomena, believing that social development is subject to specific patterns.

I. Franko's concept of scientific truth combined elements of correspondence and coherence theories. The thinker viewed truth as the correspondence of knowledge to objective reality, while emphasising that this correspondence is never absolute or final. According to I. Franko, scientific theories are approximations of truth that are constantly being refined in the process of scientific development. I. Franko recognised the multiplicity of criteria for the truthfulness of scientific knowledge: in addition to empirical verification, I. Franko considered the internal logical consistency of a theory, its explanatory power, predictive effectiveness, and heuristic fruitfulness to be relevant criteria. This multi-criteria concept of truth reflected the desire to avoid both naive realism and extreme relativism. I. Franko's concept of truth correlates with contemporary discussions about the nature of scientific knowledge within post-positivist epistemology, as noted by Y. Park *et al.* (2020) and J. Ma & Y. Ma (2022). At the same time, J. Wu *et al.* (2022) emphasise that I. Franko's views anticipated later critical reinterpretations of the positivist paradigm, in particular the recognition of the historical variability of the criteria of scientific rationality.

I. Franko was part of a generation of Ukrainian intellectuals who grew up in an atmosphere of intense absorption of European philosophical ideas in the second half of the 19th century. Positivism, which was experiencing a period of popularity in Western philosophy at that time, attracted the attention of the young thinker, who sought to synthesise scientific rationality with the social practice of national revival. As Y. Hrytsak (2019) noted, I. Franko's acquaintance with the positivist tradition came about through reading the works of the classics of this movement, as well as through the indirect perception of positivist ideas in Polish and German philosophical literature (Comte, 1830; Spencer, 1863; Mill, 1882). However, I. Franko's reception of positivism was not uncritical. The Ukrainian thinker well understood the limitations of extreme forms of positivist reductionism, especially when it came to the application of natural scientific methods to humanistic knowledge. I. Franko's positivism can be characterised as moderate, or methodological, since I. Franko borrowed from classical positivism primarily epistemological principles and methodological guidelines, without leaning towards ontological materialism or vulgar scientism (Table 1).

Table 1. *Comparative analysis of classical and I. Franko's positivism*

Characteristic	Classical positivism	I. Franko's positivism
Attitude towards metaphysics	Complete rejection	Critical, but not nihilistic
Method of cognition	Empiricism, induction	Synthesis of empiricism and rationalism
Role of science	Intrinsic value	A tool for social transformation
Application to the humanities	Direct transfer of natural science methods	Adaptation based on the specifics of the object
Social orientation	Neutrality, objectivity	Active civic stance

Source: *compiled by the author based on V. Artyukh (2017)*

The problem of the scientific method occupied a central place in Ivan Franko's epistemological views. Following the positivist tradition, I. Franko emphasised the importance of empirical justification of knowledge and a critical attitude towards any a priori constructs. At the same time, I. Franko recognised that pure empiricism is impossible, since any observation already presupposes certain theoretical assumptions and conceptual schemes. This dilemma of empiricism and rationalism found an original solution in through the concept of methodological pluralism. I. Franko recognised the leading role of the inductive method in scientific knowledge, but did not absolutise it, as some representatives of classical positivism did. I. Franko was aware of the problem of induction, according to which no number of individual observations can logically justify a general statement. As V. Artyukh (2017) notes, I. Franko's solution to this problem was to recognise that scientific knowledge is probabilistic in nature and always remains open to criticism and reformulation. The problem of scientific truth occupied a central place in I. Franko's epistemological reflections. Rejecting metaphysical concepts of absolute truth, I. Franko leaned towards a pragmatic interpretation of truth as the correspondence of knowledge to empirical data and its ability to explain and predict phenomena. This position contained elements of both correspondence and coherence theories of truth, although I. Franko did not formulate the views in terms of modern analytical epistemology. As noted by Y. Park *et al.* (2020), I. Franko emphasised the relativity and historicity of scientific knowledge, recognising that what is considered true may be revised considering new empirical data or theoretical discoveries.

The demarcation between science and metaphysics: I. Franko's position. One of the key problems of positivist epistemology – the problem of the demarcation between science and metaphysics – found special coverage in the works of Ivan Franko. In contrast to radical positivists, who completely rejected metaphysics as meaningless, I. Franko took a more nuanced position. I. Franko recognised that metaphysical questions naturally arise in human consciousness and that completely ignoring them leads to an impoverishment of intellectual life. At the same time, however, I. Franko emphasised the need for a clear distinction between scientific statements that can be empirically verified and metaphysical speculations that go beyond the limits of possible experience. I. Franko's demarcation criterion was based on the principle of verification – only knowledge that could be confirmed or refuted by empirical data was recognised as scientific. Metaphysical statements, following I. Franko, are not necessarily false or meaningless, but they cannot claim the status of scientific knowledge because they are not subject to empirical verification. This position was close to later logical positivism, although I. Franko formulated it in less technical terms and with greater philosophical caution.

Applying the principle of demarcation to various fields of knowledge, I. Franko highlighted the problem of the scientific status of the humanities. I. Franko criticised attempts to mechanically transfer natural science methods to the study of

social phenomena, but at the same time insisted on the need for scientific rigour in humanities research. I. Franko's practice of literary, historical, and ethnographic studies demonstrated the possibility of combining empirical accuracy with a concept of the specifics of humanities knowledge (Artyukh, 2017). A substantial aspect of I. Franko's approach to demarcation was the recognition that the boundary between science and metaphysics is not absolute and can change in the process of knowledge development. What is considered metaphysical speculation in one period of history may, under certain conditions, become the subject of scientific research. This dialectical flexibility distinguished I. Franko's position from dogmatic positivism and made it more productive for scientific knowledge.

The logic of science and the problem of scientific explanation. I. Franko's perception of the logic of scientific research is closely linked to epistemological principles. The thinker devoted considerable attention to analysing the structure of scientific explanation and the role of laws in scientific knowledge. I. Franko recognised that science seeks not only to describe phenomena, but also to explain them by establishing cause-and-effect relationships and formulating general laws. However, I. Franko was cautious about absolutising a deterministic view of the world, leaving room for chance and unpredictability in natural and social processes. In I. Franko's interpretation, scientific explanation involves subsuming a particular phenomenon under a general law or theoretical scheme. This corresponds to the nomological model of explanation, which was later developed by analytical philosophers of science. At the same time, I. Franko understood that in the humanities, explanation often has a different nature – it is based not so much on subsuming under a general law as on interpreting the motives, meanings and contexts of human activity. This distinction between explanation and interpretation, although not explicitly thematised by I. Franko, is present in methodological reflections.

I. Franko was also interested in the problem of scientific forecasting. I. Franko believed that the ability to predict future events based on knowledge of general laws is a substantial criterion of scientific theory. However, I. Franko was aware of the limitations of science's predictive capabilities, especially when it comes to complex systems such as society. I. Franko's view of forecasting was realistic, recognising both the significant possibilities of science in this area and the fundamental limitations caused by the complexity and variability of the world (Table 2).

Table 2. *The specificity of the scientific method in various fields of knowledge, according to I. Franko*

Aspect	Natural sciences	Humanities
Main method	Experiment, induction	Interpretation, cognition
Type of patterns	Causal, deterministic	Credible, contextual
Verification criterion	Experimental reproducibility	Hermeneutic adequacy
Role of the researcher	Objective observer	Interpreter, accomplice
Form of explanation	Compliance with the law	Revealing meanings and motives

Source: *compiled by the author based on V. Artyukh (2017)*

A substantial element of I. Franko's scientific logic was awareness of the role of hypotheses in scientific research. I. Franko emphasised that science progresses not through the mechanical accumulation of facts, but through the formulation and testing of hypotheses. Following I. Franko, a hypothesis is a form of creative synthesis of empirical data and theoretical assumptions. It must be specific enough to be empirically tested, but at the same time general enough to explain a wide range of phenomena. This view approached I. Franko to the hypothetical-deductive model of

the scientific method. I. Franko's interpretation of the logic of scientific research is consistent with the contemporary approaches of H. Zalaghi & M. Khazaei (2016) to the analysis of deductive and inductive reasoning in science, which emphasise the complementarity of these methods in the process of scientific cognition. I. Franko's attention to the problem of scientific explanation anticipates later developments in the analytical philosophy of science (Varpio & MacLeod, 2020). Thus, I. Franko was at the intersection of classical positivism and later critical rationalism, creating unique, specifically Ukrainian model of scientific knowledge, which considered the historical variability of the criteria of rationality and the need for the synthesis of science and social practice.

Conclusions

An analysis of Ivan Franko's epistemological views shows a successful integration of positivist approaches into Ukrainian intellectual context of late 19th century. I. Franko recognised the leading role of the inductive method and scientific rationality, while at the same time moving away from their absolutisation and emphasising the probabilistic and open nature of scientific knowledge. I. Franko's concept of truth combined elements of correspondence, coherence, and pragmatic theories, which addressed scientific knowledge critically, incorporating the historical variability of rationality criteria. I. Franko was at the intersection of classical positivism and later critical rationalism, forming unique model of scientific knowledge, which reconciled methodological rigour with the needs of national and social development. Thus, I. Franko's philosophical legacy confirms the possibility of synthesising European philosophical ideas with Ukrainian intellectual traditions, which makes the study of positivist views relevant to contemporary epistemology.

The study concluded that positivist ideas in Ivan Franko's epistemological views constituted an original synthesis of European philosophy of science with the needs of the Ukrainian intellectual and national liberation movement. An analysis of I. Franko's reception of classical positivism revealed specific features of Ukrainian positivism, which combined methodological rationalism with recognition of the national and cultural uniqueness of scientific knowledge. The study established that I. Franko's interpretation of the nature of scientific knowledge was based on the positivist principle of empirical verification, while avoiding the extremes of empiricism through the recognition of the constitutive role of theoretical constructs. I. Franko's epistemological position is characterised by methodological pluralism and a dialectical combination of inductive and deductive procedures of scientific research. I. Franko was critical of physical reductionism, insisting on the specificity of humanistic knowledge and the need to address cultural and historical context when studying social phenomena.

I. Franko's concept of scientific truth combines elements of correspondence and coherence theories, recognising the objectivity of scientific knowledge while acknowledging its historical variability and openness to critical rethinking. The approach to the problem of demarcating science and metaphysics is marked by philosophical balance, avoiding both uncritical scientism and relativistic scepticism about the possibilities of scientific knowledge. The results of the study show that Ukrainian positivism, as represented in the works of Ivan Franko, has a characteristic feature of a close connection between epistemological reflection and national liberation aspirations and social practice. This renders I. Franko's philosophical legacy particularly relevant to contemporary Ukrainian philosophy of science, which seeks to combine universal standards of scientific rationality with national cultural tradition. Prospects for further research involve an in-depth analysis of the influence of I. Franko's positivism on the formation of the methodological foundations of Ukrainian humanities knowledge in the 20th century, as well as a comparative study of the reception of

positivist ideas in various national philosophical traditions of Central and Eastern Europe.

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None.

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Позитивістські ідеї в філософській спадщині Івана Франка: епістемологічний вимір

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Анотація. Актуальність дослідження зумовлена необхідністю переосмислення епістемологічних основ української філософської традиції кінця XIX – початку XX століть крізь призму рецепції позитивістських ідей у творчості Івана Франка. Мета роботи полягала в комплексному аналізі позитивістської методології в епістемологічних поглядах українського мислителя та виявленні специфіки українського позитивізму як оригінального філософського феномену. У дослідженні було застосовано методи історико-філософського аналізу, компаративістики, герменевтичної інтерпретації текстів, епістемологічної реконструкції та критичного аналізу філософських концепцій. Було досліджено вплив ідей Огюста Конта, Джона Стюарта Мілля та Герберта Спенсера на формування епістемологічних поглядів Івана Франка та особливості рецепції європейського позитивізму в українській інтелектуальній традиції. Було проаналізовано франківське розуміння природи наукового знання, співвідношення емпіричного і теоретичного компонентів пізнання, концепцію наукової істини, підходи до індуктивного методу та логіки наукового дослідження. Було встановлено, що позитивістська методологія Івана Франка становила оригінальний синтез європейської філософії науки з потребами українського інтелектуального та національного відродження, поєднуючи методологічний раціоналізм із соціальним активізмом та національно-визвольними прагненнями. Було виявлено елементи наукового реалізму та інструменталізму в епістемологічних поглядах мислителя та обґрунтовано його критичне ставлення до крайнощів позитивізму, зокрема фізикалістських редукцій у гуманітарному знанні. Результати дослідження можуть бути використані викладачами вищих навчальних закладів у курсах з історії української філософії, епістемології та філософії науки, а також дослідниками для подальшого вивчення позитивістської традиції в українській філософській думці

Ключові слова: позитивізм в українській філософії; український позитивізм; позитивізм у філософії Івана Франка; епістемологія; теорія пізнання; істина

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