Liubov Vishnikina*

Doctor of Pedagogical Sciences, Professor
Poltava V.G. Korolenko National Pedagogical University
36000, 2 Ostrohradskyi Str., Poltava, Ukraine
https://orcid.org/0000-0003-0976-5512

Liana Halushka

Postgraduate Student
Poltava V.G. Korolenko National Pedagogical University
36000, 2 Ostrohradskyi Str., Poltava, Ukraine
https://orcid.org/0000-0002-2666-6447

Application of diagnostic competency-based tasks as a means of mitigating educational losses of prospective geography teachers

Abstract. The problem of the emergence and overcoming of educational losses of future geography teachers in higher education institutions of Ukraine in the context of modern challenges is relevant: the consequences of the COVID-19 pandemic, military actions and martial law. The aim of the study was to provide a theoretical justification for the methodological principles of using diagnostic competence-oriented tasks as a means of minimising educational losses among students, based on empirical research. The study used methods of analysis, synthesis and systematisation in processing the source base. To identify the causes of educational losses and determine their scope and content, testing, pedagogical observation and interviews were used. The terms "educational losses", "learning gaps" and "learning gaps" were systematised as pedagogical categories; the causes of educational losses, the scale and duration of their impact, and ways to overcome them were analysed. A step-by-step algorithm for correcting educational losses and the need to use digital teaching aids were substantiated, and the positive and negative consequences of using artificial intelligence to overcome educational losses among applicants were characterised. The paper defines the essence of diagnostic competence-oriented tasks, conducts research on the scope and content of educational losses based on their application, provides examples of the author's diagnostic tasks in the discipline 'Methods of Teaching Geography,' and a graphical diagram of the process of awareness and correction of educational losses using these tasks. The result of the authors' research was the development of a methodological model for assessing and overcoming educational losses, which has practical significance and can be used by teachers in educational institutions

Keywords: higher education seekers; learning gaps; learning gaps; artificial intelligence; methodological model

INTRODUCTION

In the conditions of serious challenges faced by Ukrainians, education remains the stronghold that keeps its position. However, higher education students have limited access to the educational process compared to students in European countries, which is caused by martial law and air attacks on the territory of Ukraine. At the same time, the restoration of normal learning during the war is of a great value, as it is a process that gives young Ukrainians confidence, stability, and a sense of safety. O. Lokshyna *et al.* (2022) provided a review of the views of the international community on the functioning of education in wartime, as well as the support of the European Union for the integration of Ukrainian children and young people into the education systems of EU member states. It was noted by the authors that during the war the basic human right for education is violated, as the educational system becomes a target of military aggression,

*Corresponding author

suffering attacks both on participants of the educational process and on the educational infrastructure.

In the methodological recommendations by O.M. Topuzova (2023), it is stated that during the full-scale war the education in Ukraine suffered significant losses and negative effects. Therefore, the increase and accumulation of educational losses is being caused by objective conditions. As highlighted in the international study by N. Jones *et al.* (2021), "gender, disability, and poverty intersect, deepening social inequality in access to distance learning", which prevents equal opportunities in times of crisis. Yu. Nazarenko (2022) determined the reasons for educational losses of learners and the consequences of their long-term impact in Ukraine, and described international experience in researching educational losses and approaches to their compensation. It was established that long-term educational losses may have serious consequences for the development of society and the economic well-being of the individual. A. Kendyukhova & O. Shylo (2024) defined "educational losses" as "losses of opportunities for comprehensive personal development – intellectual, social, emotional, psychological, etc." They state that educational losses affect the intellectual potential of the nation, economic situation, the readiness of learners for independent life, and in the future may negatively influence the scientific, technological, and socio-economic development of Ukraine over a long period of time.

S.O. Naumenko (2023), in an article devoted to the study of foreign experience in overcoming educational losses and the possibilities of using this experience in Ukrainian general secondary educational institutions (GSEI), identified directions of solving this problem, such as adjustment of training courses, re-study of the material, extended learning time, private lessons, and similar measures. In the article by P.V. Moroz (2023), potential mechanisms for overcoming educational losses in Ukraine are given. Among the ten suggested directions of activity, special attention is drawn to the following: "Development of high-quality digital educational content. The creation of e-textbooks and online platforms for learning different subjects will allow learners, regardless of their circumstances, to have broader access to educational services" and "Conducting fundamental and applied scientific research on the issue of educational losses with the aim of developing scientific and methodological framework for the compensation of educational losses".

S. Trubacheva *et al.* (2024) consider the lack of learners' independence (low learning motivation, lack of awareness of educational goals, and weak activity of students while distance mode) as the main reason of educational losses, and propose the technology of independent knowledge acquisition as an effective solution. O. Topuzov *et al.* (2023), analysing the processes taking place in Ukrainian education, state that prevention and minimisation of educational losses of learners "should be carried out on complex grounds, systematically and consistently, in accordance with the main components of the educational process". Thus, most researchers view the problem of educational losses as arising from limited access to education, instability of learning conditions, and changes of its formats. Educators cannot control the course of military actions or natural disasters, but they can influence the studying process and reduce the number of educational losses, thereby decreasing the extent of post-traumatic syndrome among learners.

Learners are in difficult life situations, forced to change places of residence, and remain in conditions of increased danger. All this leads to the fact that education in general secondary educational institutions (GSEI) is conducted in a combined online and offline mode, which is less effective, as it reduces the pedagogical influence of teachers on students' motivation towards learning. Accordingly, higher education students who enter the first year of the bachelor's degree have educational losses that need to be diagnosed and taken into account when designing the educational process in higher educational institutions (HEI). Despite the comprehensive implementation of offline learning conditions in HEI, the current realities of life in Ukraine and safety requirements for the organisation of the educational process also lead to the emergence of educational losses of higher education students. Thus, there arises the problem of determining the scope and content of these educational losses and developing ways to overcome them both in GSEI and HEI.

Therefore, the purpose of the article was to determine the theoretical foundations and applied aspects of the methodology for creating and using diagnostic competence-oriented tasks in order to overcome educational losses in the process of professional training of future geography teachers.

MATERIALS AND METHODS

To achieve the stated aim, both theoretical and empirical research methods were used. An analysis and generalisation of the source base related to the subject of the study were carried out; systematisation of the component structure of the concept "learning losses" was made. Existing definitions and approaches to the interpretation of educational losses were systematised. The component structure of the concept was arranged. Based on the synthesis of the results of theoretical analysis and data from previous studies, a methodological model for assessing educational losses of future geography teachers was developed. Owing to this step-by-step approach, methodological foundations were formed for designing diagnostic competence-oriented tasks to identify gaps in the professional training of students.

Among empirical methods, testing, pedagogical observation, and interviews were applied. The aim of the empirical stage was to identify the volume, content, and reasons for educational losses both quantitatively and qualitatively. Testing was conducted at Poltava V.G. Korolenko National Pedagogical University before the beginning of the courses "Physical Geography of Continents and Oceans" and "Physical Geography of Ukraine" in September of the third semester of study, using competence-oriented tasks of three levels of complexity using a 100-point grading scale. The research involved a group of 14 second-year students

and 15 students of the bachelor's level programme "Secondary Education (Geography)". Testing was conducted in the classroom during a lecture. Each student received tasks of all levels of complexity in order of increasing difficulty.

The first-level tasks were focused on controlling the acquisition of empirical knowledge, namely geographical facts, geographical nomenclature, and geographical representations. The second-level tasks were productive and required the application of geographical knowledge and skills. The third-level tasks were aimed at identifying the level of theoretical knowledge formation and its application for solving problem situations and creative-level tasks. Pedagogical observation was carried out during classroom lessons with fixation of students' activity at the beginning of the lesson. Interviews were conducted individually to clarify subjective reasons for educational losses (low motivation, lack of awareness of goals, difficulties of distance learning). All this made it possible to outline the main subjective barriers to learning and integrate them into corrective measures of the methodological model.

The use of all empirical methods was accompanied by clear rubrics of assessment criteria. The processing of test results involved the distribution of students' mistakes according to the levels of complexity of diagnostic competence-oriented tasks (COT), quantitative expression of mistakes in percentages, and visualisation in the form of a pie chart. The identified gaps were taken into account when refining the relevant training programmes. The qualitative analysis of observations and interviews consisted in classifying the factors causing learning losses. The results of applying empirical and theoretical research methods were the basis for creating a methodological model of assessing and overcoming educational losses of future geography teachers. The cyclic process "planning - testing - analysis - correction" made it possible to update the content and methods of teaching educational components promptly, guaranteeing that the educational programme meets the identified needs of students. Testing was conducted in written form in accordance with ethical standards of working with children (United Nations, 1948; Code of Academic Integrity of the Poltava V.G. Korolenko National Pedagogical University, 2022).

RESULTS AND DISCUSSION

Despite active research by scholars and teachers on educational losses, there is still a need to study this issue in relation to the professional training of future geography teachers. For lecturers of relevant educational programmes, it is important to seek new ways of organising students' learning activities, taking into account existing and potential educational losses, and to try to ensure a high-quality educational process by using innovative methods and technologies, digital tools, and advanced psychological and pedagogical approaches. On the other hand, the search for ways to overcome educational losses requires careful theoretical research of a didactic direction, the development of applied foundations and methodological recommendations for the organisation of learners' educational and cognitive activities and the evaluation of their learning outcomes.

V. Kovalchuk *et al.* (2022), after analysing the factors resulting from the threat of the pandemic and the imposition of martial law in Ukraine, emphasise that "the educational process in Ukraine is in a crisis situation: on the one hand, due to the threat of coronavirus spread, and on the other hand, due to the invasion of the Russian army into the territory of Ukraine". This double challenge highlights the need to adapt forms and methods of learning activities not only to the conditions of a particular institution but also to the individual needs of each learner. The authors underline that "a future qualified specialist should possess professional skills at a high level, be mobile, and able to respond flexibly to changes…", which in turn requires the future geography teacher to engage in constant self-development, professional growth, and the development of partnership skills.

In the manual prepared with the support of the International Foundation "Renaissance", it is noted that the specific feature of educational losses is that if effective measures are not taken in time to overcome them, they will accumulate and deepen (Zvynyatskivska, 2023). O. Malykhin *et al.* (2022) argue that creating a new model of education in the current conditions is practically impossible. Therefore, the way out of this critical situation should be a certain adaptation of the existing model of learning to current realities. It is worth noting that in the absence of reliable data on the scale of educational losses, the development of state policy aimed at systematic response becomes especially important. As Yu. Nazarenko (2022) emphasises: "the scale of existing challenges does not allow to expect that they will be solved by themselves without targeted state policy". This implies the creation of strategic documents, in particular the updating of the Educational Assessment Strategy and the introduction of compensatory measures. Her study also states that experiencing war at any age has a negative impact on both mental and physical health. Therefore, the support that learners can receive in the process of developing their professional competences is vital. Modern trends in education require forecasting the consequences of educational losses caused by the war, since these losses may significantly influence the social development of Ukraine in the future. Geographical education combines both natural and social directions in the formation of key and subject competences of learners at all educational levels. Moreover, it is aimed at the development of critical thinking, creativity, and innovativeness, which contributes to social progress and the development of a high-tech labour market. Accordingly, the professional training of future geography teachers should ensure their ability to educate and develop generations of students capable of solving complex economic, ecological, and environmental problems on which the future of Ukraine depends. At present, the effectiveness of professional training depends on the ability of lecturers and students of higher pedagogical education to overcome existing educational losses. Therefore, before analysing the corresponding processes in higher educational institutions

(HEI), it is necessary to determine the terminological basis of the studied phenomenon.

N. Bychko & V. Tereshchenko (2023) point out that in scientific literature there are many terms that, having entered Ukrainian practice through calquing, are sometimes inaccurate. This leads to the fact that in academic and informational space the same concepts may be used interchangeably: educational losses, learning gaps, learning losses, losses in learning, gaps in education, gaps in learning, learning disparities, achievement gaps, or missed knowledge. From their work it is known that the most widely used terms are "educational losses," "learning gaps," and "learning disparities". The term educational losses should be considered as a decrease in the level of knowledge, skills, and competences of learners due to disruptions of the educational process that arise as a result of emergencies such as war, pandemic, forced displacement, or prolonged distance learning. Learning gaps refer to the absence or insufficient acquisition of knowledge, concepts, or skills necessary for further successful learning. Learning disparities are a significant difference in the level of knowledge and learning outcomes between learners or groups of learners, caused by unequal access to educational resources or different learning conditions that emerged during the pandemic and the war. This term is often used to describe systemic disproportions in access to high-quality education (Fig. 1).
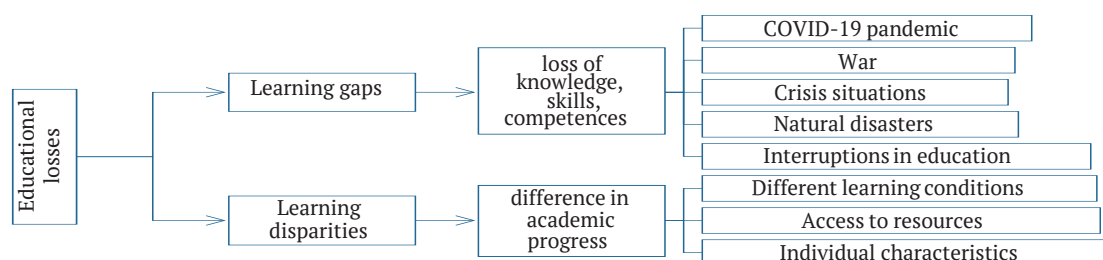

Figure 1. Scheme illustrating the distinctions between the concepts of "learning gaps" and "learning disparities"
Source: developed by the authors based on N. Bychko & V. Tereshchenko (2023)

The presented scheme clearly distinguishes two levels of educational losses: "learning gaps" as specific deficits in knowledge, skills and competences, and "learning disparities" as larger disproportions in academic progress. At the same time, the list of external and internal factors shows that both gaps and disparities have a multi-component nature. The awareness of this distinction helps to develop targeted strategies – from differentiated diagnostic COT to educational projects aimed at ensuring equal access to high-quality education. It is important to analyse the causes, scope, and duration of the impact, as well as the manifestations and strategies for overcoming educational losses, learning gaps, and disparities (Table 1).

Table 1. Educational losses, learning gaps, and learning disparities as pedagogical categories

Analysis criteria	Educational losses	Learning gaps	Learning disparities
Essence of the concept	General decrease in the level of knowledge and skills	Absence or weak acquisition of specific knowledge/skills	Difference in learning achievements between different students or groups
Causes	Emergencies: war, pandemic, displacement, technical difficulties, etc.	Insufficient explanation, missing topics, individual difficulties	Unequal access to resources, varying learning conditions, and differences in the quality of education
Scope of impact	Mass (whole institution, region, country)	Individual or a group of learners	Intergroup (between groups of learners, institutions, regions, categories of students)
Duration of impact	Medium or long-term	Can be short or long-term	Often long-term, accumulates over time
Manifestations	Significant lag behind curricula, loss of motivation	Learner does not understand a new topic due to unmastered previous material	Some learners systematically achieve much better results than others
Ways of overcoming	Additional learning, corrective programmei, psychosocial support	Individual work, revision of topics, teacher support	Systemic support for vulnerable groups, equal access to high-quality education for all

Source: developed by the authors based on Yu. Nazarenko (2022)

In Table 1 it is clearly shown that educational losses, learning gaps, and learning disparities overlap in their features but differ in the scope of impact. The given classification emphasises the need for combined strategies for their effective overcoming. In other words, it indicates the necessity of combining various solutions, pedagogical practices, and educational strategies. As A. Marchuk (2023) notes, under martial law HEI students lose and fail to acquire knowledge, skills, abilities, and competences that are essential for professional growth and career success. The digitalisation of higher education helps to reduce educational losses and creates safe conditions for lecturers and students, ensuring the effectiveness and functioning of the educational process.

The COVID-19 pandemic, during which education switched to a distance format, enabled the HEI system to adapt quickly to training during the war. Learning was resumed in online and blended formats. However, the educational process under martial law is complicated by air alarms and massive missile attacks. In addition, the psycho-emotional state of higher education students and lecturers influences the quality of organisation of learning and cognitive activities during classes. The above indicates the objective conditions for the emergence of educational losses of learners in HEI and the real need to determine an algorithm for solving the problem of overcoming educational losses, learning gaps, and disparities, which can be applied by pedagogical staff of HEI. Based on the analysis of authors' experience in overcoming educational losses of future geography teachers, an algorithm for solving the problem of overcoming educational losses, learning gaps, and disparities in HEI was proposed (Table 2).

Table 2. Algorithm for solving the problem of overcoming educational losses, learning gaps and disparities in HEI

1. Assessment of losses	Conducting diagnostics. Detailed analysis to determine the quality of the educational process.
2. Plan for restoring lost knowledge, skills, and competences	Development of individual learning plans taking into account learners' educational gaps. Identification of the main learning material that requires special attention. Setting deadlines to compensate for learning losses
3. Adaptation	Changing forms of organisation of learning activities to reduce overload and facilitate knowledge acquisition. Use of digital learning tools. Increase of motivation and interest of learners.
4. Support and opportunities	Providing learners with technical equipment for online classes. Psycho-emotional support for learners and lecturers during the war. Organisation of seminars, webinars, and trainings for lecturers to improve their readiness to work in this direction.
5. Support from the state	Development of model programmes to compensate for educational losses among higher education students. Development of technologies and methods to eliminate learning gaps. Ensuring funding for the implementation of educational goals.
6. Cooperation with international organisations	Use of relevant international experience in the educational process of HEI.
7. Innovations	Development of new curricula and syllabi, improvement of study programmes. Application of modern digital resources to improve the quality of the educational process.
8. Monitoring, evaluation	Continuous monitoring of educational progress. Regular evaluation of the effectiveness of implemented algorithms and adjustment of strategies.
9. Communication	Open dialogue among all participants of the educational process. Public discussion of the issue of educational losses and appeals to educational institutions for the necessary support.
10. Preparation for the future	Development of a set of strategies to prevent similar educational losses in the future. Creation of resilient and flexible educational systems capable of adapting to unpredictable situations.

Source: developed by the authors

The availability of psycho-emotional support and technical resources for solving the problem is aimed at providing comprehensive assistance to learners and lecturers in difficult conditions. State support and cooperation with international organisations will help to exchange best practices, which will contribute to the sustainability of initiatives. Constant monitoring and communication create feedback that allows prompt adjustment of strategies and guarantees continuous improvement of the educational process. A relevant problem in the development of physical geography, as a component of the natural science educational field, is the occurrence of the greatest educational losses in the formation of experimental skills. This is especially important in distance learning conditions, where students do not have real access to equipment, and the main source of information is textbooks and study manuals. At the same time, in the current conditions of digitalisation of education, the experience of countries that introduce e-learning as a tool for ensuring educational resilience during crises becomes particularly important. International practice shows that "e-learning is not inferior in quality to face-to-face learning, and under conditions of warfare it is relevant and critically important for the provision of educational services" (Nosachenko, 2022; Bakhmat *et al.*, 2023).

Among the digital tools that have become an obligatory component of the modern educational process, a special place is occupied by the use of Artificial Intelligence (AI) both by lecturers and learners. The use of AI in blended learning has become an important element of learning activity. The use of chatbots such as ChatGPT, GIMINI, and others can currently both assist in the formation of professional competences of future geography teachers and contribute to increasing their educational losses. AI chatbots can explain complex topics in simple words, act as personal tutors, answer questions, provide examples, etc. (Table 3).

Table 3. Positive and negative consequences of using Artificial Intelligence to overcome educational losses of learners

Positive consequences	*Negative consequences*
Individual approach to learning	Decrease of critical thinking
Increase of efficiency and saving of time	Risk of academic dishonesty (cheating, plagiarism)

Table 3. Continue

Positive consequences	Negative consequences
Access to knowledge 24/7	Excessive dependence on AI
Support of inclusive education	Possible mistakes or unreliable information
Development of digital skills	Issues of confidentiality and data security

Source: developed by the authors

AI adapts to the level of knowledge and learning pace of the learner, helping to focus on the main aspects and saving time. In addition, AI can be useful for learners with special educational needs, as they are able to access it at any time, without being limited by a lecturer's schedule. On the other hand, if future geography teachers mindlessly copy AI answers without paying attention to possible geographical or psychological-pedagogical mistakes, they lose skills of independent analysis, text writing, problem-solving, and so on. Finally, systematic and thoughtless use of AI may slow down the development of critical thinking and increase the volume of educational losses. To avoid negative consequences, lecturers should reconsider the design of learning tasks and requirements for their implementation. In this sense, the use of AI as a universal learning tool requires new approaches to the organisation of the educational process. AI should not imitate learners' intellectual activity, but rather stimulate it. As L.D. Zelenska & T.S. Kopteva (2024) note, the development of digital competence of geography teachers by means of Artificial Intelligence is a promising and in-demand direction of professionalisation of teachers in the context of digitalisation of society and the spread of blended and distance learning during the war of russia against Ukraine.

Therefore, AI is a powerful educational tool which, when used in a balanced and ethical way, can ensure the overcoming of educational losses rather than their accumulation. In addition, in the context of reducing educational losses of future geography teachers, the use of geoinformation models in the educational process is quite effective. They may serve not only as a tool for visualising geographical data but also as a means of stimulating cognitive activity. As researchers point out, geoinformation learning models are a tool for organising independent cognitive activity of students, allowing them to explore the geographical environment (Topuzov *et al.*, 2019). Such models can be integrated into the structure of diagnostic competence-oriented tasks, particularly in the assessment of learners' spatial thinking, in the development of skills of cartographic data analysis, and in solving problem situations in a geoinformation environment.

Another means that can be used to reduce educational losses is the application of various digital educational platforms. As O. Bondarenko *et al.* (2023) state, digital platforms create conditions for targeted support of students' spatial thinking, which is critically important for the formation of geographical literacy. Thus, digital platforms serve not only as a technical resource but also as a pedagogical environment capable of integrating diagnostics, reflection, and competence development into a single educational trajectory of future geography teachers.

The tendency toward a decrease in the level of future teachers' geographical subject competencies, caused by learning gaps, negatively influences the quality of their professional training. In higher education conditions, the diagnostics of educational losses should be based on the principles of effectiveness, as well as taking into account learners' individual cognitive characteristics. A key aspect of the training of future geography teachers is the formation of professional competences, among which knowledge and the ability to apply it play an important role. Considering this, pedagogical research was conducted, aimed at assessing the level of knowledge and skills necessary for high-quality teaching of geography in general secondary educational institutions (GSEI). In order to diagnose learning gaps in the educational achievements of future geography teachers, competence-oriented tasks (COT) were used. COT are tasks that model problematic (contradictory) situations and require intellectual search from contradiction to new knowledge, for the development and diagnosis of key competences.

Scholars prove that assessment is a key element of the learning process. It increases the effectiveness of learning and guides educational processes (Grynyov *et al.*, 2024). In the context of using diagnostic COT, assessment becomes not only a tool for measuring results but also a means of timely identification of learning gaps and guiding the educational process towards overcoming them. This is especially important for the training of future teachers, where the ability to reflect and think analytically is the basis of professional maturity. The use of diagnostic COT is part of "building back better" (Lennox *et al.*, 2021), as they allow identifying educational losses and designing learning that meets the real needs of future teachers.

Therefore, COT can, on the one hand, serve as a tool for diagnosing and identifying learning gaps, and on the other hand, motivating and encouraging learners to self-assess and overcome such gaps. According to the research results among students, it was found that the largest number of mistakes (67%) were in the tasks of the third level of complexity, which according to the national ECTS scale correspond to the level "excellent". This highlights the challenges learners face in comprehending geographical causal relationships and regularities. The insufficient formation of the conceptual apparatus negatively affects the structuring of scientific concepts and their application in new contexts (Fig. 2).
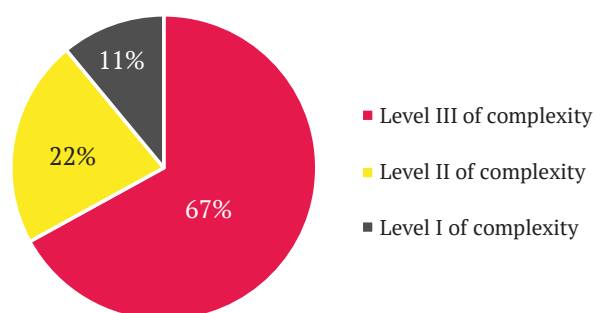
Figure 2. Distribution of students' mistakes by levels of complexity of diagnostic COT
Source: developed by the authors

22% of mistakes were made by participants while completing tasks of the second level of complexity, which indicates educational losses related to the formation of their geographical skills and the ability to apply knowledge to solve applied problems. While performing the first-level tasks, learners completed the largest number of tasks correctly. These tasks accounted for the smallest number of mistakes (11%), which indicates some progress in school geography learning regarding the use of visualisation tools,

as well as achievements in the formation of geographical concepts, nomenclature, and facts.

Therefore, the results of testing demonstrated that educational losses are most evident in complex analytical tasks, which require a systematic approach, critical thinking, and integration of geographical knowledge. According to the testing results, lecturers, when designing curricula of the specified disciplines, considered the identified learning gaps and disparities of learners, as well as the potential possibilities of overcoming them. According to the needs of improving the mechanisms of diagnostics, assessment, and overcoming of educational losses of future geography teachers, a comprehensive methodological model was developed. The model defines and specifies its conceptual foundations and the set of tools for assessing educational losses. In addition, it presents the content of the stages of educational loss assessment: primary diagnostics; in-depth analysis of learning gaps and disparities; and development of corrective measures. The step-by-step algorithm of overcoming educational losses presented in the model will allow lecturers of the relevant disciplines to form effective corrective technologies, which will contribute to improving the professional training of learners (Fig. 3).
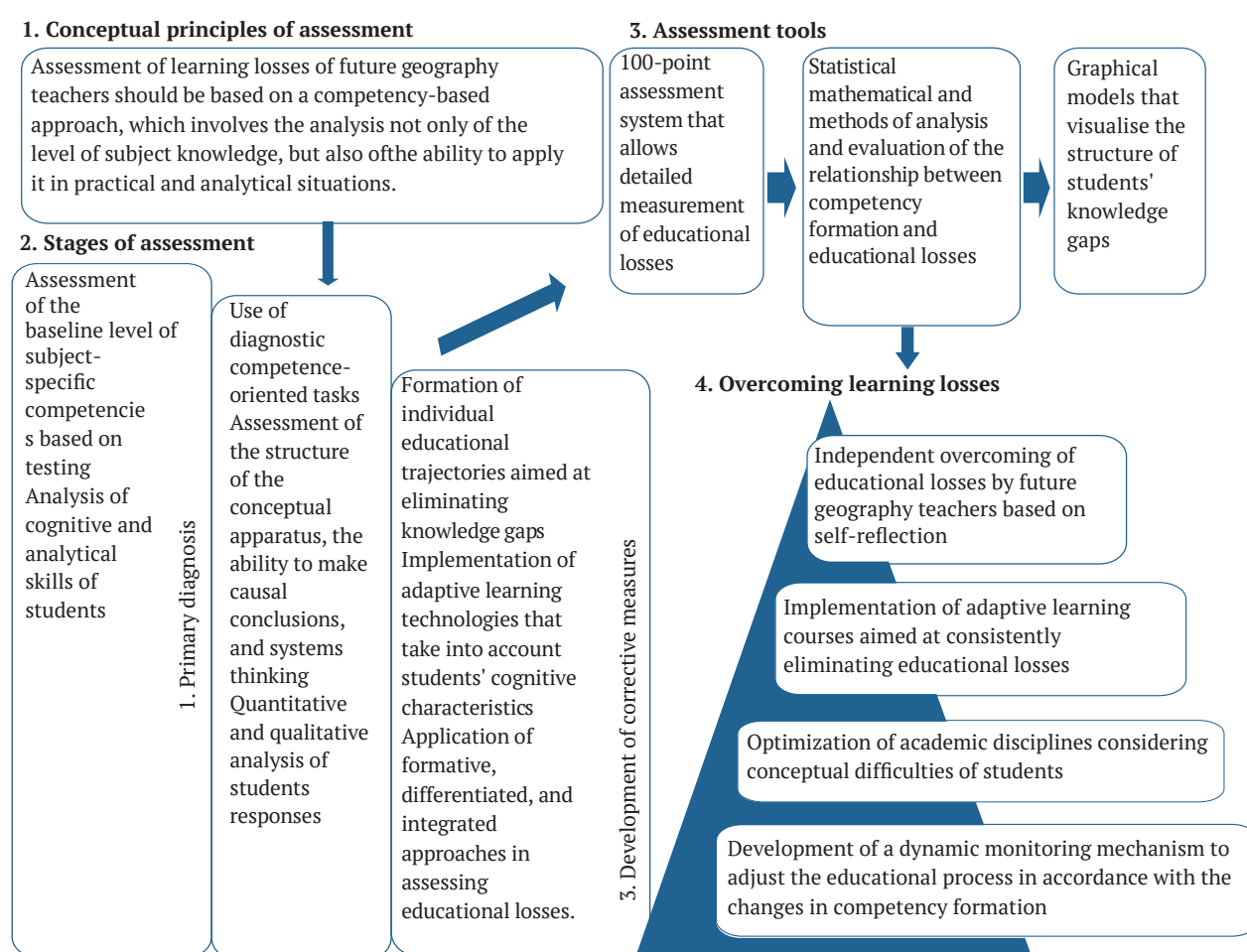

Figure 3. Comprehensive methodological model for assessing and overcoming educational losses of future geography teachers
Source: developed by the authors

To conduct monitoring research on the training of future geography teachers, it is advisable to involve lecturers who understand the specifics of geographical and psycho-pedagogical disciplines within the relevant educational programmes. Collective monitoring work carried out by lecturers will help comprehensively determine the content and extent of educational losses, as well as the methods for overcoming them. Considering the identified learning gaps and disparities during the design of the educational process will make it possible to provide individual support to students who experience difficulties. It is advisable to assess their academic progress at the beginning and at the end of the semester. A set of such procedures, combined with formative assessment, will enable lecturers to adjust their teaching activities and provide timely assistance to students who need support.

The advantage of this approach is the reduction of educational losses and the possibility of creating a supportive and positive atmosphere. It is important not to forget about academic integrity, the promotion of which will help learners to focus on learning and personal development rather than fear of results. If there is a need to make up academic hours, this can be done by providing additional learning materials and self-study assignments online. The amount of such hours depends on the number of students and the volume of missed learning material. There is no perfect strategy; therefore, it is necessary to take into account individual needs and circumstances when choosing the right compensation algorithm and making decisions for each student separately.

The effectiveness of using the above-mentioned diagnostic COT lies in their ability to measure the level of students' mastery of professional competences. Since COT are performed individually, both lecturers and students can jointly determine the scope and content of learning gaps that require additional work. It is important that the identification of such gaps takes place in a stress-free environment and contributes to overcoming the disparities that need to be filled, taking into account the individual circumstances of students - such as the inability to study during air raids, being in occupied territories, lack of internet access, relocation, evacuation, or power outages.

The design of diagnostic COT involves clear definition of the goals of diagnostic assessment and the creation of tasks based on real-life situations. At the first stage of designing diagnostic COT, the target learning outcomes are determined, and then tasks are developed based on realistic life scenarios. This approach makes it possible to ensure the connection between theoretical content and practical activities, which is especially important in the process of reducing educational losses during the professional training of future geography teachers. COT are multifunctional. Their functions include: objective identification of gaps in students' knowledge, skills, and abilities; providing lecturers with opportunities to adjust the educational process; enabling an individual approach to solving students' problems; preventing the emergence of further learning gaps; and guiding students toward continuous academic progress (Fig. 4).
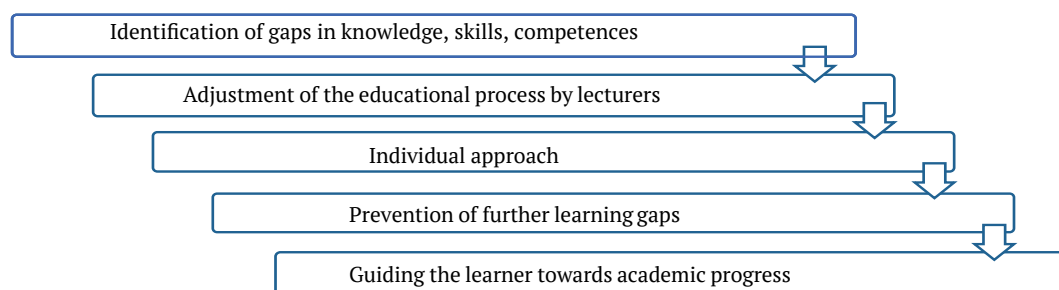

Figure 4. Features of diagnostic COT

Source: developed by the authors

Figure 4 illustrates a closed cycle in which diagnostics becomes the starting point for continuous improvement of the educational process. The transition from analysing current results to making corrections allows a quick response to students' individual needs. Timely prevention of new learning gaps simultaneously strengthens motivation and confidence in the ability to overcome challenging tasks. The vector of all stages is directed toward the steady growth of each student's academic achievements. The formation of methodological competences is a key component of the professional training of future teachers, as the quality of geography education depends on their ability to organise students' learning and cognitive activities both during lessons and in extracurricular contexts. Accordingly,

a set of diagnostic COT has been developed, which can be used to identify educational gaps in the course "Methods of Teaching Geography" (Table 4).

After completing diagnostic COT, learners review the correct answers that helps them to adequately evaluate their own achievements and gaps in knowledge, skills, and competences. During this research it was found that diagnostic COT, both in distance learning and in classroom settings, help future teachers to understand their own learning gaps, while enabling the lecturer to determine the level of complexity of the problem that needs to be solved. The scheme presented in Figure 5 illustrates the process of awareness of educational losses by future geography teachers with the help of diagnostic COT.

Table 4. Diagnostic COT in the professional training of future geography teachers

Topic of practical classes, discipline "Methods of Teaching Geography"	Formulation of diagnostic COT
Formation of subject-specific geographical competences	It is well known that one of the priority tasks of geography education in secondary schools is the development of various types of skills. Imagine that you are currently conducting a lesson for 6th-grade pupils and need to develop their intellectual skills. How would you do this? Design a fragment of a geography lesson (the topic of the lesson is chosen by the student).
Verbal teaching methods in geography	You probably all have memories of school when a teacher explained something in such a way that you still remember their story. They create a mental representation of a geographical object, process, or phenomenon. A vivid description of nature, not overloaded with facts, is easy to remember. Try to design a 7th-grade lesson segment in which storytelling and explanation are applied. The duration should be up to 10 minutes (the lesson topic is at the learner's discretion).
Practical teaching methods in geography	Creating a weather calendar by pupils requires new methodological approaches, taking into account their access to modern information sources. At the same time, the systematic observation of weather details encourages pupils to compare and analyse results, overcoming potential challenges. Provide interesting examples of motivating and encouraging pupils to organise weather observations (5 examples).
Methodology for working with outline maps	A geographical map is both a language and a source of information in geography. The creativity of a geography teacher is revealed in the innovative design of engaging tasks that correspond to the current level of scientific development. The teacher should derive satisfaction from designing unconventional lessons that serve as didactic discoveries. Therefore, design two tasks for pupils of 6–9 grades using an outline map. Primitive or well-known tasks are not accepted.

Source: developed by the authors
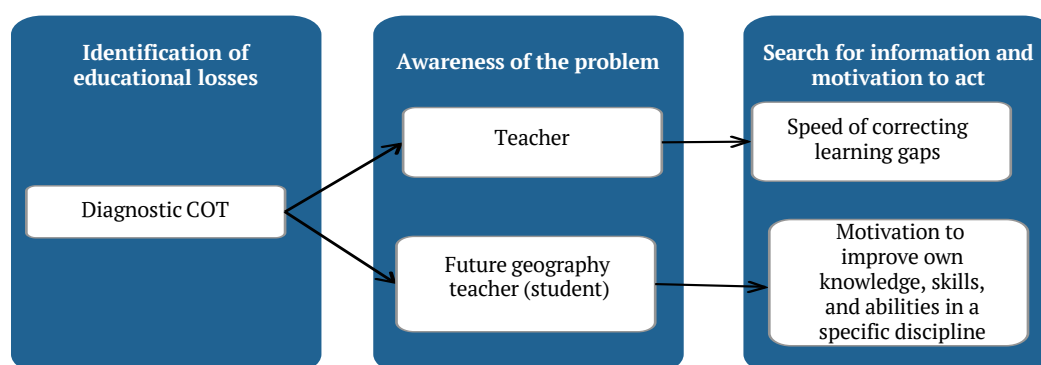
Figure 5. The process of identifying and remediation educational losses through diagnostic competence-oriented tasks
Source: developed by the authors

The sequence of transforming the results of applying diagnostic COT into practical corrective steps is determined by the close connection between the identification of gaps and the targeted search for information. Through the involvement of both participants, both lecturer and learner, an interaction arises that increases the accuracy of assessment and the promptness of further changes in the learning process. The emphasis on the speed of implementing corrections and the students' internal motivation shows that the effectiveness of the process largely depends not only on methodological tools but also on the students' readiness to take responsibility for their own development. Overall, this approach strengthens the cyclical nature of the educational process, where each stage becomes an impulse for continuous improvement. The analysis of completed tasks contributes to the formation of the ability for reflection and self-correction of learning achievements.

This, in turn, positively influences learners' educational progress and motivation for further learning activities.

CONCLUSIONS

In the conditions of modern global challenges, particularly the combination of the pandemic and the war, educational losses have become a serious challenge for learners. Future geography teachers, as key participants in the educational process, require effective tools to minimise such losses. One of such a tool is COT, which, on the one hand, are a component of the assessment-analytical element of the educational process, and on the other hand, an effective means of reducing educational losses of future geography teachers. However, it is difficult to implement new models of overcoming educational losses at the state level during martial law. To solve this task, cooperation of lecturers from different HEI is required. A comprehensive system of educational

measurement should be created within the relevant educational programmes, using standardised testing based on the combination of diagnostic competence-oriented tasks. Special attention should be paid to the integration of adaptive digital educational platforms, which, based on the results of diagnostic testing, will form individual learning trajectories for learners. Without a system of objective measurement of educational losses, it is impossible to build a strategy for overcoming them. In addition, it is advisable to study and adopt the experience of foreign countries in overcoming educational losses more attentively.

The presented study does not exhaust the essence of the problem of applying diagnostic COT as a means of overcoming educational losses of future geography teachers, since it requires recognising the problem of educational losses in HEI as one that needs urgent solution on the basis of systematic methodological reflection. There is also a need for further development of applied aspects of the proposed methodological model for assessing and overcoming such losses. A lecturer of HEI should see the real picture of students' educational losses in order to overcome them in time. The application of diagnostic COT contributes to the development of reflection and self-assessment skills, to the identification of gaps and their subsequent elimination. This allows future teachers to adapt more effectively to the conditions of the educational process and to achieve the planned results envisaged by the curricula. Future research should focus on determining the impact of diagnostic COT on the correction and reduction of educational losses of future geography teachers and on assessing the long-term effects of their use.

CONFLICT OF INTEREST
The authors declare no conflict of interest.

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Любов Вішнікіна
Доктор педагогічних наук, професор
Полтавський національний педагогічний університет імені В.Г. Короленка
36003, вул. Остроградського, 2, м. Полтава, Україна
https://orcid.org/0000-0003-0976-5512

Ліана Галушка
Аспірант
Полтавський національний педагогічний університет імені В.Г. Короленка
36003, вул. Остроградського, 2, м. Полтава, Україна
https://orcid.org/0000-0002-2666-6447

Застосування діагностичних компетентнісно орієнтованих завдань як засіб подолання освітніх втрат майбутніх учителів географії

Анотація. Актуальною є проблема виникнення та подолання освітніх втрат майбутніх вчителів географії у закладах вищої освіти України за умов сучасних викликів: наслідків пандемії COVID-19, військових дій та воєнного стану. Метою дослідження було теоретичне обґрунтування методичних засад застосування діагностичних компетентнісно орієнтованих завдань як засобу мінімізації освітніх втрат здобувачів на основі емпіричного дослідження. У дослідженні застосовано методи аналізу, синтезу та систематизування при опрацюванні джерельної бази. Задля з'ясування причин виникнення освітніх втрат, визначення їх обсягу і змісту використовувались методи тестування, педагогічного спостереження та бесіди. Здійснено систематизування термінів «освітні втрати», «навчальні прогалини», «навчальні розриви» як педагогічних категорій; проаналізовано причини виникнення освітніх втрат, масштаб і тривалість їхнього впливу, способи їх подолання. Обґрунтували поетапний алгоритм корегування освітніх втрат, необхідність використання цифрових засобів навчання, схарактеризували позитивні й негативні наслідки застосування штучного інтелекту задля подолання освітніх втрат здобувачів. У роботі визначено сутність діагностичних компетентнісно орієнтованих завдань, проведенню дослідження обсягу і змісту освітніх втрат на основі їх застосування, наведено приклади авторських діагностичних завдань з дисципліни «Методика навчання географії», розроблено графічну схему процесу усвідомлення та корекції освітніх втрат за допомогою цих завдань. Результатом дослідження авторів стала розроблена методична модель оцінювання й подолання освітніх втрат, яка має прикладне значення і може бути використана викладачами закладів освіти

Ключові слова: здобувачі вищої освіти; навчальні прогалини; навчальні розриви; штучний інтелект; методична модель