



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 ChatGPT, 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 ChatGPT 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 (Chernovaty, 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. Bohuslavskaya *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. Poltavskiy (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, методика 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