

Artificial intelligence and the transformation of teaching roles: insights from lecturers' experiences

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Abstract

This study is devoted to examining and analysing the roles of university teachers (professors and lecturers) in the AI world. Today, AI is increasingly prevalent and ubiquitous in our lives. In such conditions, the role of the lecturer changes. The lecturer is no longer just a generous giver of knowledge or the verifier, but also a provider of information, sometimes a moderator, or a teammate. These are only three roles out of many (we characterised seven lecturers' roles) that exist and, in our view, differentiate lecturers' functions in the current era of AI. A mixed-methods approach (a combination of qualitative and quantitative strategies) was chosen and applied for the research procedure. Based on an analysis of previously published scientific literature on the use of AI in teaching by university teachers, the authors proposed seven roles that teachers can perform in the educational process using AI: a leading teacher, a mentor, a teammate, a provider of information, an assistant, an instructor, and an explorer. An analysis of the surveyed data and a Pearson correlation analysis (Pearson's r) were conducted. Findings confirm that lecturers primarily value AI as a tool for simulating learning and teaching tasks that are difficult to complete, allowing students to practice assignments and lecturers to provide their wards with multiple attempts to develop professional abilities and practice skills during tutorials. In their view, this role is more in demand in AI. The role of the lecturer in the era of AI is primarily to provide information, while AI serves as a helpful tool. Moreover, the results of the questionnaire analysis allowed us to note that the roles of an instructor, a mentor, and a leading teacher are also highly valuable in an AI-supported process of delivering knowledge to the mentee. A comprehensive Pearson's r and processing of survey data showed that lecturers (this is slightly more than one-third / 7% "always" = 27.9% "often" = 34.9% / Pearson's $r = 0.44$) who regularly incorporate AI into the teaching and learning process tend to have a more positive assessment of AI's potential and affirm its use in enhancing the quality of higher education. However, opinions varied. Pearson's r also revealed that some lecturers utilise AI in their work. Still, they are generally sceptical about the value of AI in general and its suitability for educational purposes (7% of respondents hold this view / Pearson's $r=0.06$).

Keywords

artificial intelligence, lecturer, Higher education, survey, role of lecturers, correlation, Pearson's r

1. Introduction

Since its inception, digital technologies have undergone a constant process of evolution and improvement during recent decades. The education system and pedagogical approaches to teaching students have evolved significantly since their inception. Computer technologies have been used in the educational sphere for a considerable time, evolving from analogue to digital devices as technology has advanced.

In the 1950s, the advent of television vastly expanded the range of opportunities for all members of society, becoming a dominant broadcast for sharing opinions quickly. The TV news is integrated

DigiTransfEd 2025: 4th Workshop on Digital Transformation of Education, (September 24, 2025, Kyiv, Ukraine)

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into the information environment, including the learning space. Moreover, headphones are used in lessons to listen to recorded audio lectures [1]. Notably 1953, the University of Houston offered the first televised college credit courses. For this, the first public television station, namely KUHT, in the United States was used [2]. In the subsequent decades, computer-based learning has revolutionised, giving students access to more educational resources. Coding languages have become essential for building modern applications [3].

In the early 21st century, SMART boards became prominent tools. Microsoft's online services division reshaped the educational landscape. Cloud-based Learning Management Systems (LMS), such as Blackboard, allow learners to access educational materials online. In 2010, self-directed learning (SDL) was seen as a key component of lifelong learning. Moreover, Massive Open Online Courses (MOOCs) have become widely used in education, offering a flexible and affordable learning environment [1].

Today, AI is one of the most innovative phenomena. In the United States of America, teachers are rapidly implementing and using AI tools during lessons. Meanwhile, AI-based applications and games are widely used in the USA by teachers (51% of teachers). Adaptive learning platforms (43%) are also widely used (see figure 1).

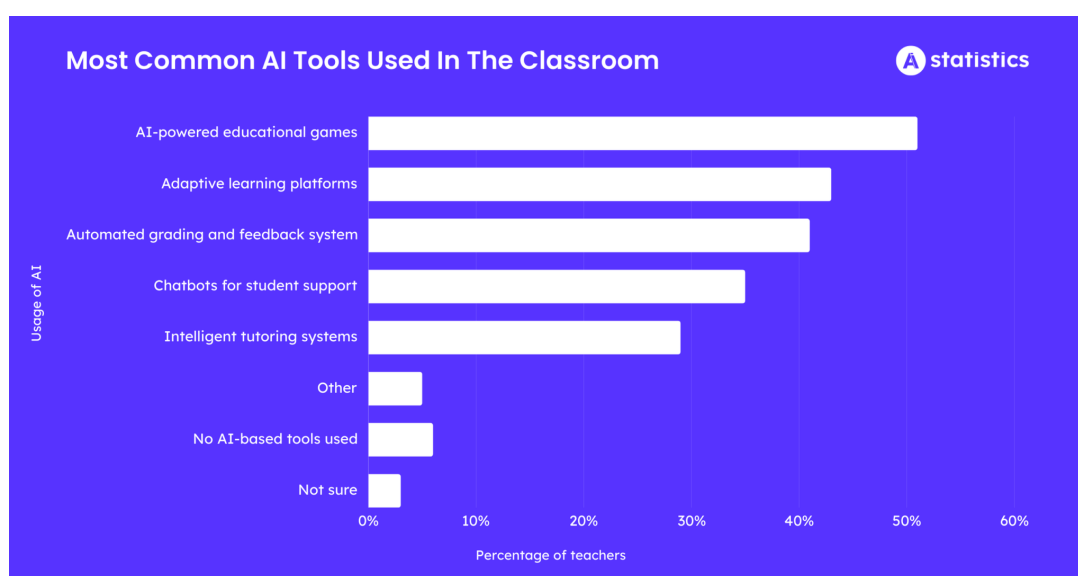


Figure 1: The AI tools that are most commonly used in the USA, during the lessons. Source: <https://aistatistics.ai/education>.

India's higher education system ranks among the largest in the world (the second-largest in the world). In India, there is a large population. Several significant trends in AI education are emerging there. It includes intelligent tutor systems, pedagogical agents, innovative (smart) classroom technologies, and adaptive learning [4]. Ukraine's higher education system has also kept pace with the times. Lecturers utilise AI tools in Ukraine to achieve various learning and teaching objectives. Particularly, lecturers use AI tools for increasing the availability of materials, improving the organisation of the educational process, automating the creation of didactic material [5], for developing and practically applying knowledge about soft skills among future specialists in the IT sphere [6], as well as for personalised teaching and automated assessment [7].

It should be noted that when new digital technologies, AI tools, AI-powered platforms, and other AI resources emerge, the teaching methods are subsequently tailored to the needs of students and adjusted to the education standards. Simultaneously, the work of teachers and lecturers inevitably adapts to the changing times. The role of the lecturers in class has been modified. Earlier, the primary role of the lecturer was to transfer knowledge to students and assess their outcomes. Today, the lecturer is more of a facilitator [8], a mentor, and a motivator who encourages and inspires students to learn, enabling them to navigate the difficulties that exist and affect the realm of education [9]. In the current era, the primary role of the lecturer is to help students navigate the information, critically evaluate available

information sources, and utilise modern digital opportunities and AI-based solutions for individual learning and personal development.

As a result of the changes in the times we all live, the role of the lecturer becomes more flexible and dynamic. The lecturer today is not only a provider of knowledge but also a guide in the world of AI opportunities, helping students develop the skills necessary for a long and successful career in today's competitive world in the 21st century.

The development of digital technologies, AI tools, and applications encourages us as scientists to rethink the role of the lecturer in education. A question that arises is as follows: Has the role of a lecturer changed due to the widespread use of AI in higher education? Along with the necessity to answer this question, we believe there is a need to rethink the role of the lecturer in the contemporary era of AI. Having this question and the need outlined in the sentence above in mind, we stated research questions (RQ):

1. Which lecturers' roles have scientists already determined (in recent scientific papers), considering the rhythm of the development of AI technologies?
2. How do lecturers see their roles in the era of AI?
3. Do the professional experience of lecturers (including working with AI and attitude towards AI) and their sense of anxiety about their roles in the AI era correlate with the roles they set out to themselves?

To answer these questions, it is good to start with a background that reveals how previous digital transformations (before the widespread use of AI-powered technologies) changed the role of the lecturer in the educational process.

2. Background

This section examines scientific sources that highlight the evolution of digital technology use in education and how these changes have impacted lecturers' roles and responsibilities. This review allowed us to identify at least five key stages in transforming the lecturer's professional role within the context of educational digitalisation. These stages range from the initial steps of computerisation to the introduction of e-learning and MOOCs and the use of immersive technologies and artificial intelligence. This section reviewed and analysed the first four of these stages.

2.1. The initial experience of computerisation in education: the place and role of the lecturer

As education becomes increasingly computerised, the lecturer's role is evolving and needs to adapt to the new realities of education. In the 1990s, the introduction of computers in education transformed traditional views of the lecturer's professional role. Previously, lecturers were primarily sources of knowledge and organisers of the educational process. However, with computers providing an alternative or additional source of information, students' reliance on lecturers gradually diminished. As a result, there was an urgent need to update teaching strategies. Muirhead [10] noted that the role of lecturers was evolving from that of merely translating knowledge to becoming facilitators of meaningful, student-centred learning. This shift required educators to take a more active and creative role in fostering an educational environment where students were engaged participants rather than passive recipients of information [11], [12]. Berge [13] emphasised that lecturers were expected to model effective learning and moderate discussions, integrate specialised knowledge, and support constructive group dynamics.

However, scholars and practitioners emphasised that computers by themselves do not ensure improvements in the educational process; the teacher plays a crucial role [14]. The computer is neutral as a tool, and its effectiveness depends on reasonable and pedagogically appropriate usage [15]. It is important to note that not all teachers initially viewed computers as valuable tools. Some were sceptical about their appropriateness and even saw them as distractions from the primary goal of delivering meaningful educational content. In many instances, computers were primarily used for administrative

purposes, and their deep integration into education was uncommon. Over time, however, lecturers began to recognise the educational potential of computer technologies.

Shi and Bichelmeyer [15] observed a significant shift in teachers' experiences between 1991 and 2004. During this period, most educators transitioned from having no computer experience to achieving basic computer integration in their daily activities. However, this initial adoption did not substantially change pedagogical strategies or educational program content. Although Internet access was limited in academic institutions, computers were already used to develop skills, demonstrate educational simulations, and automate routine tasks. Throughout this evolution, teachers remained central figures, gradually taking on new roles as mediators between students and technology and the navigators in the information landscape.

According to Berge [13], the computer age created several roles for lecturers, including pedagogical, social, administrative, and technical. However, one individual did not need to fulfil all these roles. Recognising the importance of dividing responsibilities and fostering team collaboration became increasingly essential.

A significant challenge during that period was the need for lecturers to become computer-literate. They had to learn how to create electronic materials, work with databases, test systems and digital reports. Wasserman and Millgram [16] noted that lecturers' attitudes towards computers changed significantly over time. They began to feel a sense of mastery with these digital tools, and their fear of using them disappeared. This change opened up opportunities for experimentation and the creative integration of technology into teaching.

So, lecturers gradually took on a leading role in the computerisation of education, acting as initiators of change, mediators between traditional and modern teaching methods, and responsible for integrating technology into the learning process. Computers did not replace lecturers during the early stages of computer education; instead, they fundamentally transformed the lecturers' professional roles and opened up new opportunities for enhancing the educational environment.

2.2. The transformation of the lecturer's role during the emergence of e-learning

The emergence of e-learning in the early 2000s was another stage in the transformation of the traditional role of the lecturer in the higher education system. In the transitional period preceding the widespread adoption of MOOCs, a gradual rethinking of the functions of the teacher in the digital educational environment began. The availability of learning materials in digital format without the direct involvement of lecturers led to a change in emphasis from transmitting knowledge to supporting the students' learning autonomy. Due to the increased flexibility of the educational process, the lecturer more frequently assumed the role of a mentor, helping students develop key skills for independent learning, such as self-organisation, time management, and reflection.

The scientists [17] identified several roles that teachers adopt with the emergence and development of e-learning. These roles included instructor, learning materials designer, social role, learning facilitator or consultant, technologist, student performance evaluator, and manager or administrator. Three new teacher roles were emphasised: learning materials developer, manager or administrator, and social role.

In the new environment, lecturers increasingly took on the role of creators of digital educational content, including video lectures, interactive presentations, visual and multimedia materials, and online tasks. This approach required not only proficiency with digital tools but also an evolution in teaching style to accommodate the unique characteristics of the electronic learning space. As Kassop [18] noted, preparing educational content in advance enabled teachers to devote more attention to providing individual student support. This, in turn, reduced the time needed for processing feedback and fostered conditions for deeper reflection and critical analysis.

An essential component of the teacher's professional role was the development of instructional design. The successful implementation of e-learning required the ability to structure the educational process, select relevant formats of interaction and assessment, and organise educational content considering the unique characteristics of digital communication [19].

One of the main new functions was the moderation of online communication, which involved

initiating and supporting discussions in forums, coordinating the work of student groups, providing timely feedback, and ensuring a social presence which was essential for forming a learning community [20]. Educators were often expected to be open-minded, willing to co-learn with students, and recognise the value of collective knowledge seeking in a digital environment. As Greener [21] emphasised, an effective teacher in the digital age had to demonstrate substantive and procedural expertise, flexibility, and the ability to engage in dialogue.

Moreover, the social role of the lecturer in the e-learning context was to create a supportive learning environment where conflicts were prevented, emotions were controlled, and an atmosphere of cooperation was maintained [22].

Thus, during the e-learning period, the teaching role expanded significantly. The lecturer was no longer simply a “source of knowledge”. However, it became a facilitator, designer, moderator, mentor, and technical intermediary who reduced the psychological and pedagogical distance between the student and the learning content.

2.3. Functions of a lecturer in the era of Massive Open Online Courses

With the emergence and rapid development of MOOCs, the educational space has undergone radical changes. The traditional role of the lecturer as a translator of knowledge gradually evolved into a facilitator of learning. In the context of MOOCs, aspects of teaching activities such as supporting student autonomy, structuring the educational process, stimulating self-reflection, and social interaction have gained greater importance. The lecturer had become not only a source of information, but also a moderator of the educational environment, which contributed to the active assimilation of knowledge and the formation of individual educational paths (e.g. [23]). Cohen and Holstein [24] study, which analysed 3.460 student reviews of MOOCs, demonstrated that the presence of the lecturer and their active participation were key factors in a positive educational experience. Course participants expected structured support and feedback, without which the effectiveness of the educational process in the online environment is significantly reduced. Thus, despite the scalability of MOOCs, the human factor continued to play a decisive role.

In modern reality, the lecturer increasingly becomes the “designer” of the learning experience. This role involves creating and providing interactive digital content, completing tasks with automated feedback, integrating gamification elements in educational materials, and ensuring the availability of materials to students. As Haavind and Sistek-Chandler [25] noted, with the emergence of MOOCs, the role of the lecturer (a professor, a university teacher) differed from the lecturer’s role when explaining the content and peculiarities of the course on the online platform. It involved transferring knowledge and directing, organising, and technically producing content, which requires a high level of professional training.

An analysis (conducted by Goshtasbpour et al. [26]) of teachers’ work using MOOCs’ resources revealed that the priority is given to the social presence of the teacher in the educational process to support the process and the facilitating role of the teacher in the teaching-learning interaction. This again demonstrated the multifunctionality of the lecturer role in the digital environment, extending beyond the traditional notion of the educator. Providing an effective learning experience in massively online courses was often carried out by interdisciplinary teams that included lecturers, technical support specialists, content managers and learning environment designers [27].

A significant consequence of MOOCs’ openness and global reach has been the lecturer’s public positioning. Their personality, interaction style and professional values were visible to many students, forming a new level of academic influence and responsibility [28]. In this context, the lecturer also performed the function of a facilitator, which facilitates discourse (oversees and moderates debate forums, maintains a pleasant learning environment, motivates students, oversees possible social networks associated to the course) and oversees quality (performs a final qualitative test before course start, reports on technical issues) [29].

In addition, new realities required merging the roles of lecturer and ICT coordinator. As Fairman and Mackenzie [30] noted, these professional positions often overlap with the role of educational

leader, which involves active innovation, reflective practice, and support for colleagues' professional development. According to Tømte and Wollscheid [31], the boundaries between these roles have become increasingly blurred, creating new forms of pedagogical leadership in the context of the digital transformation of education.

Therefore, despite the automation of many processes, human factors and human labour remain crucial. MOOCs do not substitute a professional lecturer's work. Moreover, MOOCs' platforms and their use in training require even more supportive work from the lecturer to be effective in the educational process. In the digital age, a lecturer must be not only an expert in the field of education but also be able to mentor, motivate, and provide innovative ideas.

2.4. The role of a lecturer in the age of immersive technologies: Is the lecturer's role transforming?

The rise of immersive technologies (virtual reality (VR), augmented reality (AR), and extended reality (XR)) has transformed how teachers and students are involved in the educational process. The role of the lecturer, traditionally recognised as one of transferring knowledge, is being increasingly transformed. Today, the scientific community can confirm that the lecturer assumes the roles of both a facilitator of the teaching-learning process and an analyst of digital enhancements [32, 33].

In the VR/AR environment, lecturers have taken on greater responsibility (from delivering the content educational materials to contributing to the formation of cognitive knowledge). Teaching has increasingly shifted towards project-based learning, where lecturers promote independent learning [34, 35]. In the context of XR, lecturers are organisers of the teaching-learning process, which is interactive [33]. This new approach demands a high level of digital literacy (including methodological flexibility and interdisciplinary awareness from lecturers).

The lecturer's ability to analytically comprehend the process of teaching and training based on data became increasingly important. An immersive environment opens up the possibility of personalising learning through the analysis of students' behaviour [36]. As a result, the lecture serves as an "interpreter" of educational analytics, transforming digital data into pedagogical solutions that focus on developing the student's potential.

In the context of the rapid technologicalisation of education, the issue of pedagogical identity has acquired particular significance. According to Lee and Wu [37], VR training for lecturers contributed to developing new skills and rethinking the teacher's role as a mentor (or designer, a mediator) capable of solving complex teaching tasks. At the same time, this transformation has led to challenges. In this context, Jantanukul [38] constated a mixed attitude of lecturers to immersive technologies (on the one hand, enthusiastic and on the other hand, uncertain, because of the lack of methodological instructions). This situation highlights the need to establish comprehensive pedagogical support. AR transforms the teacher's mission, shifting it to the coordination of the training process. In a VR learning environment, a teacher serves as a coordinator in the classroom [39]. This function implied high flexibility [40].

Thus, the transformation of the lecturer's role in the age of immersive technologies is obvious. The lecturer is increasingly becoming an analyst and a mentor rather than just a giver of knowledge.

3. Research methodology

A mixed-methods approach is applied. This approach (a mixed-methods way of exploration) is suitable for clarifying the essence of the RQs. The research methodology incorporates a descriptive approach, qualitative and quantitative analysis, a survey method, and a correlation analysis.

3.1. Descriptive method (to capture the essence of the RQ1)

The descriptive method was used to analyse previously published scientific literature on using AI in teaching by university teachers and journal articles from open-access and peer-reviewed journals. It enabled researchers to share their views on the role of lecturers in education in the era of AI. The

analysis focused on conceptual aspects that define the role of lecturers in teaching in the AI era. To analyse scientific publications on the roles of lecturers in the AI era at the current stage of AI technology development as of 2025, we searched for relevant scientific publications on the Scopus platform, Scopus AI, and Web of Science.

After employing inclusion and exclusion criteria (table 1), nine studies were included in the analysis (figure 2).

Table 1

Inclusion and exclusion criteria.

Inclusion	Exclusion
Peer-reviewed final scientific publications involving Higher IT education	Scientific works not related to higher IT education
Include topics about the role of university teachers in the AI era	Not include topics about the role of university teachers in the AI era
Published between 2022 – 2025	Published before 2022
Published in English	Published in a language other than English
Open access	Closed access
	Duplicates

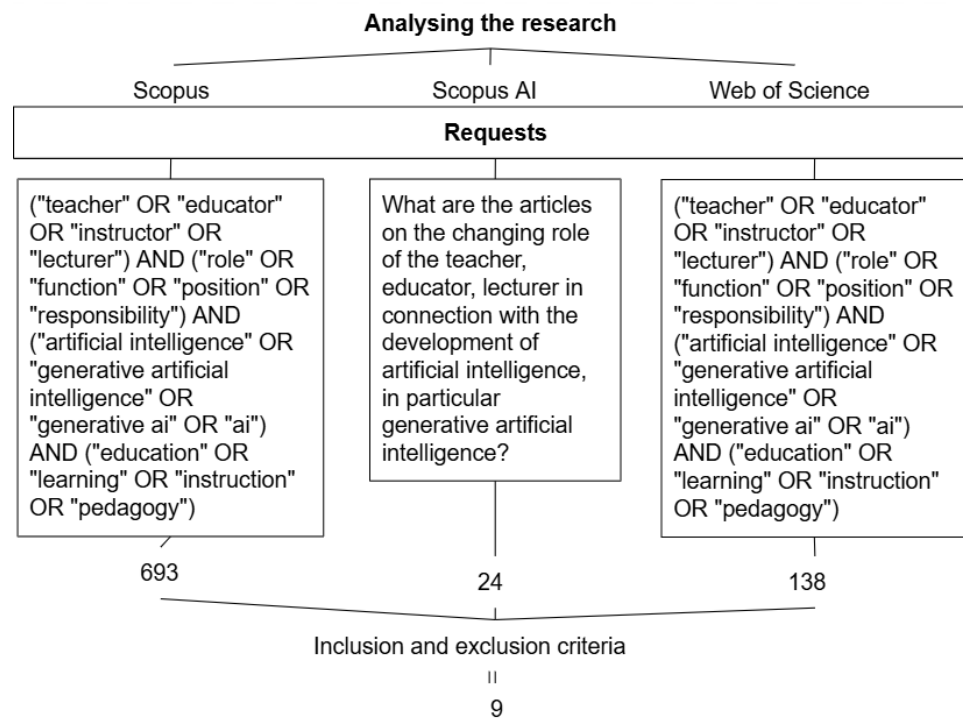


Figure 2: Scheme of research analysis on the role of a lecturer (a university teacher) in conditions of the current state of development of AI technologies

3.2. Quantitative and qualitative analysis / Survey method (to capture the essence of the RQ2)

To explore lecturers' self-perception regarding their roles in the AI era, an online survey (Google Forms) was offered. The survey offers both closed-ended and open-ended questions (such as in which university you are working). Participants expressed their views on their role (what they think), attitudes toward AI, and perceived challenges. All participants were informed about the purpose of the research and provided informed consent before participating (explanatory notes). The target survey group consisted

of lecturers. The questions are thematically related to AI's current use or consideration in university teachers' teaching practice. To process the obtained data, quantitative and qualitative analysis was conducted. This allowed for clarification of views on teacher roles.

3.3. Correlation / Qualitative method (to capture the essence of the RQ3)

Quantitative analysis methods were employed to determine whether there is a correlation between lecturers' attitudes toward AI and their implementation of AI tools in teaching. The collected survey data were analysed using correlational analysis (Pearson correlation coefficients).

4. Result

4.1. Analysis of articles

In the era of rapid Gen AI development, the role of the lecturer is being reconsidered. Increasingly, scientists are examining how the responsibilities of lecturers are evolving, identifying new competencies that are becoming essential, and exploring the ethical and pedagogical challenges that arise from interactions with AI. Researchers (see table 2) are not only focusing on the pedagogical aspects of integrating AI into students' training process but also exploring the relationships between lecturers, students, and opportunities for using AI technology, as well as their applications. The scholars' views and studies' findings from recent study-related publications are summarised in the table below.

Table 2

The role and functions of a lecturer in the age of AI: a literature review.

The authors	The role and functions
Kshetri [41]	Professional leadership, critical thinking, and pedagogical responsibility on the part of humans
Thompson et al. [42]	Mediator: helps students interpret and validate AI output Practitioner: adapts methodologies and instructional design Critical thinker: participates in shaping ethical frameworks and policies Researcher: creates and disseminates the empirical basis for educational decision-making
Mateus et al. [43]	Critical analyst and evaluator Learning environment designer Facilitator, GenAI is just a helper, and the lecturer is the central figure guiding constructivist learning Reflective practitioner and researcher
Deng and Meng [44]	A three-way collaborative model of intelligent learning, referred to as "teacher-AI-student", is presented
Ravarini et al. [45]	Creator and designer
Zhai [46]	Observer, Adopter, Collaborator, and Innovator
Bower et al. [47]	Adapt the content, methods, and assessments Teach students to work with AI critically and ethically Motivate students to develop fundamental human qualities that remain beyond the reach of AI
Nadim and Di Fuccio [48]	Ethically integrate AI and prepare students for an AI-driven future Ensure the development of critical thinking and emotional intelligence in students Form a moral position on the use of AI
Cooper et al. [49]	GenAI user and critical analyst, an ethical mediator between students and new technologies

A literature review enabled us to focus on the role of the lecturer in the era of AI, which has evolved (from a giver of knowledge to a professional well-versed in pedagogical, ethical, technological, and

research aspects). Today, a lecturer serves as a facilitator of learning, a mediator, or a creator of teaching resources. Moreover, a lecturer serves as a mentor today, promoting the responsible use of AI. A lecturer clarifies the ethical standards to be followed while using AI. So, in the era of Gen AI, the role of the lecturer can not be underestimated.

The study deserves special attention E. R. Mollick and L. Mollick who proposed approaches to using AI in education [50] (see table 3).

Table 3

Approaches for using AI in class. Adopted from Mollick and Mollick [50].

Approach	The characteristics of the approaches	Pedagogical benefits	Pedagogical risks
AI-tutor	Direct instruction	Effective in teaching	Confabulation (fabricated information believed to be true) risks
AI-coach	Prompt metacognition	Contribute to improving learning outcomes	Risks of incorrect advice
AI-mentor	Providing feedback	Frequent feedback contributes to improving learning outcomes	May contain errors
AI-teammate	Increase team performance	Provide alternate opinions	Confabulation (fabricated information believed to be true) and errors
AI-tool	Accomplish tasks	Help learners accomplish more within the same time frame	Outsourcing thinking, rather than work
AI-simulator	Deliberate practice	Practicing	Inaccuracies
AI-student	Receive explanations	Teaching others is a powerful learning technique	Confabulation (fabricated information believed to be true) risks

Considering the approaches detailed in table 3, we defined the roles of lecturers in the teaching process with AI integration. These lecturer's roles are as follows:

1. A leading teacher acts as the lead teacher or a head teacher, and AI is a supportive assistant in a leading teacher's work (a leading teacher explains, guides, and corrects the errors. AI provides examples or practice.
2. A mentor helps students reflect, think critically, and assess the completed tasks by the mentee. AI generates content and assists in preparing instructions.
3. A teammate assists students. The lecturer's role in this case is to help teammates by cooperating with an AI resource. They both support students in collaborative or group activities.
4. A provider of information uses AI mainly as a tool. At the same time, the lecturer remains the primary source of information in the teaching process. AI helps complete tasks, but it does not assume a teaching role.
5. An assistant guides students while they complete the assigned tasks and explains these tasks. AI helps students deepen their understanding.
6. An instructor uses AI as a simulator for practice, while he is supervising and providing feedback (For example, AI chats for language practice or role-play).
7. An explorer is unsure how to define his role yet. He is still exploring.

Summarising the above, we have distinguished and characterised the roles of lecturers in the educational process with the implementation of AI. We characterised the functionality of these roles. Our considerations are based on the previous research findings of researchers and our own experience working with AI. The following lecturers' roles with AI implementation were identified: a leading teacher, a mentor, a teammate, a provider of information, an assistant, an instructor, and an explorer.

4.2. Analysis of a survey

In the questionnaire (see Appendix A), teachers from various countries participated, including Ukraine (72.1%), Norway and Romania (7%), Spain and Lithuania (4.7% each), Slovakia, and Poland (2.3% each) (figure 3). The total number of participants is 43. The survey was conducted using an online Google Form from June 4 to 16, 2025.

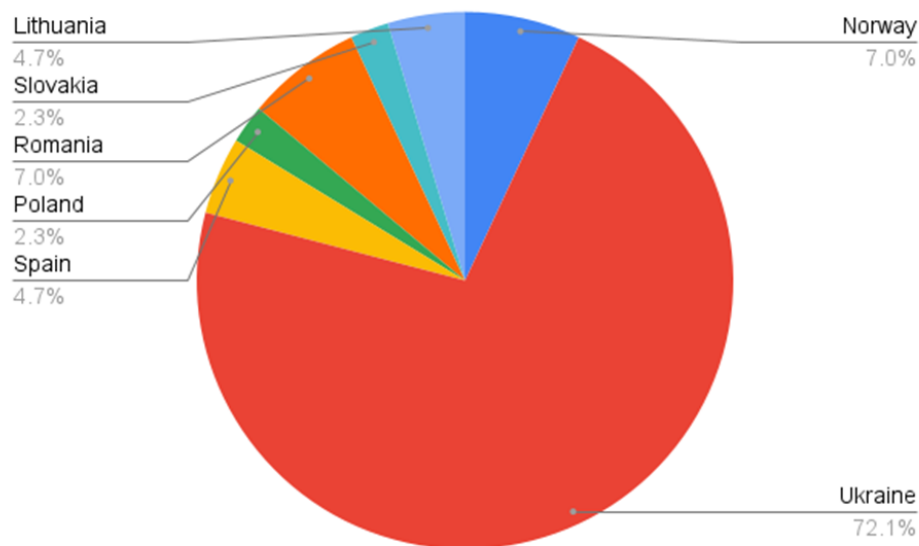


Figure 3: Countries of origin of the survey participants.

Education is a professional sphere in which most (52.4%) of the surveyed participants are specialised. Information technology specialists (14.3%) also took part in the questionnaire. Moreover, teachers of maths, healthcare, and medicine (each at 9.5%) express their opinions on AI in their work. Furthermore, the educators in the following subjects participated in the survey: science and technology (4.8%), environment and agriculture, energy and utilities, management and administration, and applied mathematics and cybernetics (2.4% each) (figure 4).

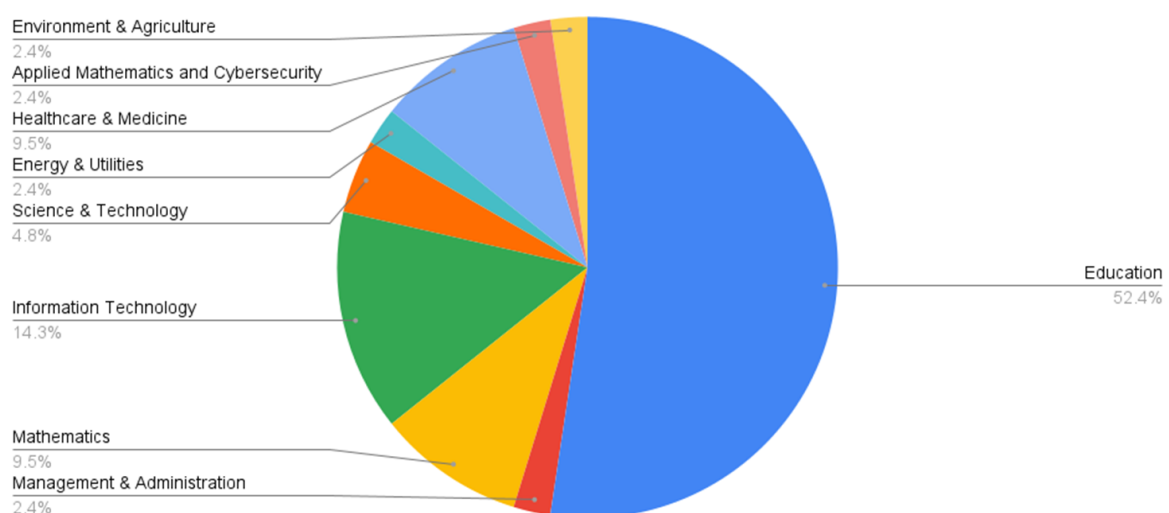


Figure 4: Teaching specialisations of the survey participants.

Most of the surveyed individuals hold a PhD (39.5%). Postdoctoral or Doctor of Science (37.2%),

Master's degree (20.9%), and one participant has another qualification not indicated in the survey.

Most of the teachers who took part in the survey have been working in educational sphere more than 20 years (46.5%), 23.3% has 10–20 years of experience, 5–10 years – 16.3%, 3–5 years – 9.3%, not over 3 years – 4.7% of the surveyed participants (figure 5).

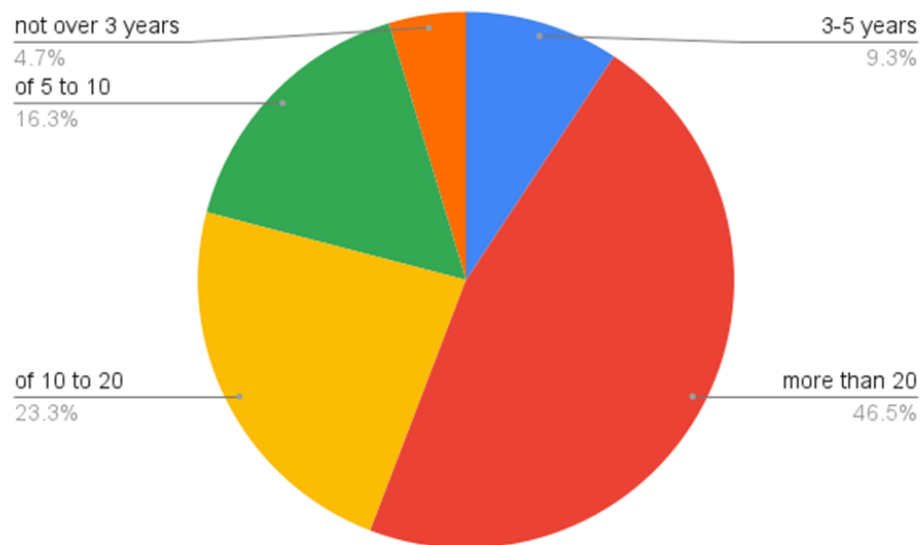


Figure 5: Experience in higher education (in years).

Teachers use AI technologies in their teaching activities. Most participants occasionally use AI. 27.9% often use AI, 16.3% rarely use AI, and 7% always use AI (figure 6).

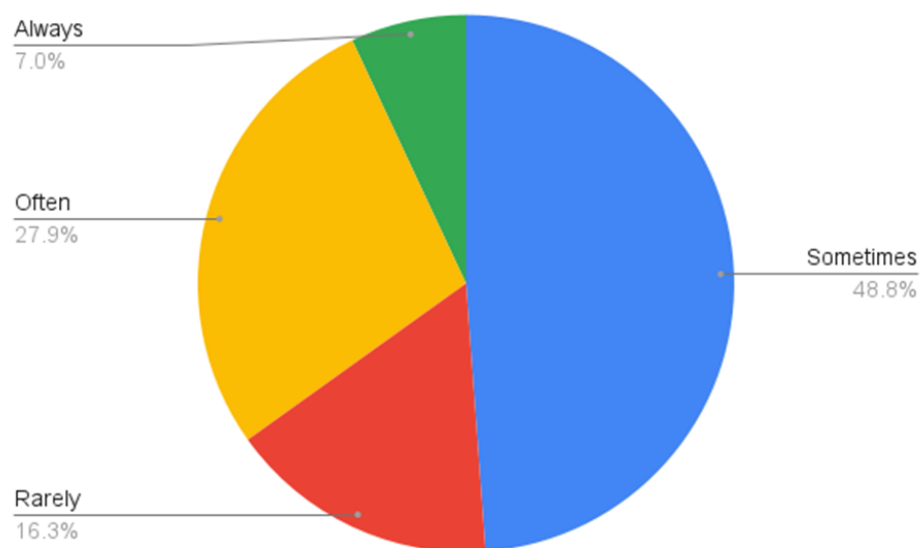


Figure 6: Usage frequency of AI tools for teaching purposes by the survey participants.

Over half of respondents believe that integrating AI into teaching improves the quality of the learning process (55.8% – agree, and 4.7% – strongly agree). Almost 33% (to be more precise, 32.6%) were neutral on this subject. But 7% disagree (figure 7).

The survey addresses a few key issues: (1) what is the role of AI in teaching and which approach for using AI in class is the most recognised by survey participants, (2) how AI has transformed teachers'

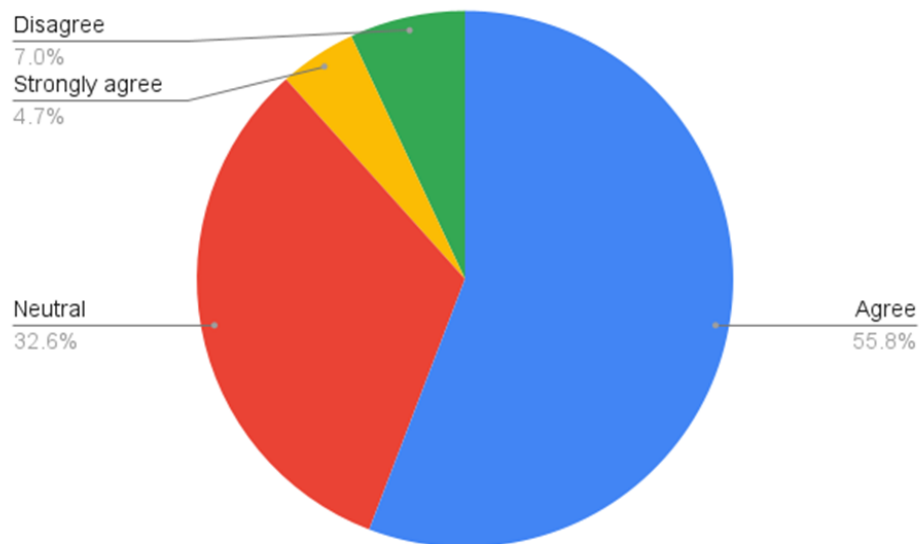


Figure 7: Views related to the AI implementation in the teaching and learning process for enhancing the quality of education.

roles in class, and (3) to what extent anxious thoughts and fears related to AI govern teachers' minds. For this purpose, survey questions were administered, and the following findings were obtained. Defining the role of AI for teachers in teaching (participants were asked to choose more than one of the proposed roles in the list). Thus, thanks to this, it was possible to find out that more than half of the respondents, 60.5% perceive AI as a "helper of the teacher", as an AI-simulator. For many teachers, AI is seen as either an AI coach or an AI tool (39.5% each). Teachers also acknowledge the value of AI-mentor (37.2%), AI-tutor (34.9%), AI-teammate (30.2%), AI-student (25.6%), and AI as a helpful assistant for improving both students' work and teaching materials (1 participant thinks so, which accounts for 2.3%) (figure 8).

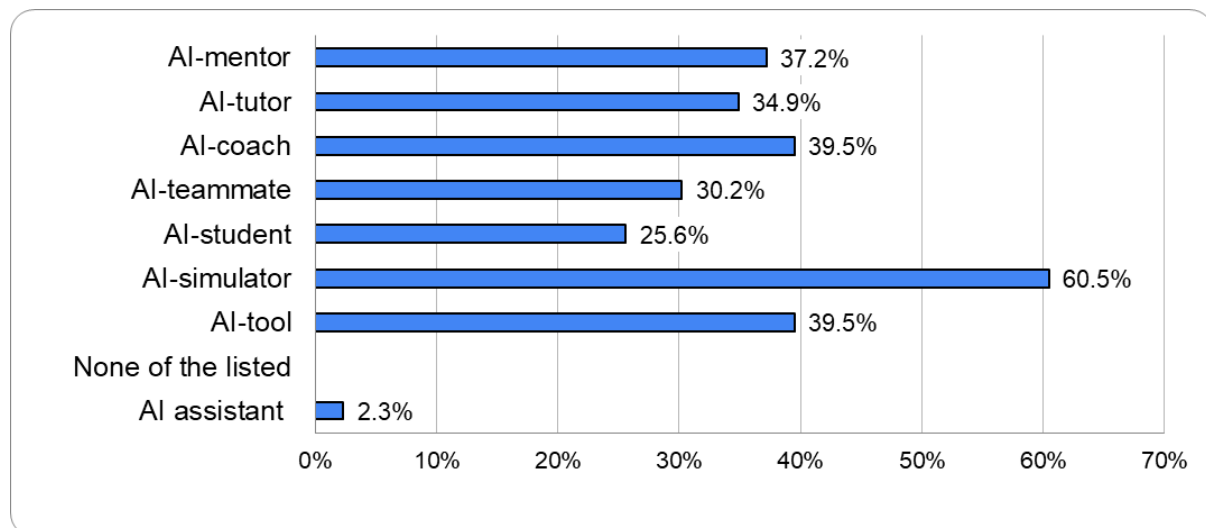


Figure 8: AI's roles in class: respondents' views.

Considering that AI can act as a tutor, mentor, coach, teammate, tool, simulator, or student, the survey participants were asked to choose the role they see themselves taking on in the contemporary learning environment where AI is an inseparable part of reality. Research results indicate that lecturers perceive their roles in education differently in the era of AI. Most participants (25.6%) confirm that they are information providers in class, and AI tools assume the role of a helper. More or less the

same number of surveyed respondents defined their roles as follows: an instructor (18.6%) who uses AI as a simulator for practising task completion; a mentor (16.3%) who uses AI to assist in preparing instructions; and a leading teacher (16.3%) who uses AI as a supportive assistant. Participants believe their primary role is to be a teammate or an assistant (4.7% each). At the same time, 14% of survey participants are unsure how to define their roles (figure 9).

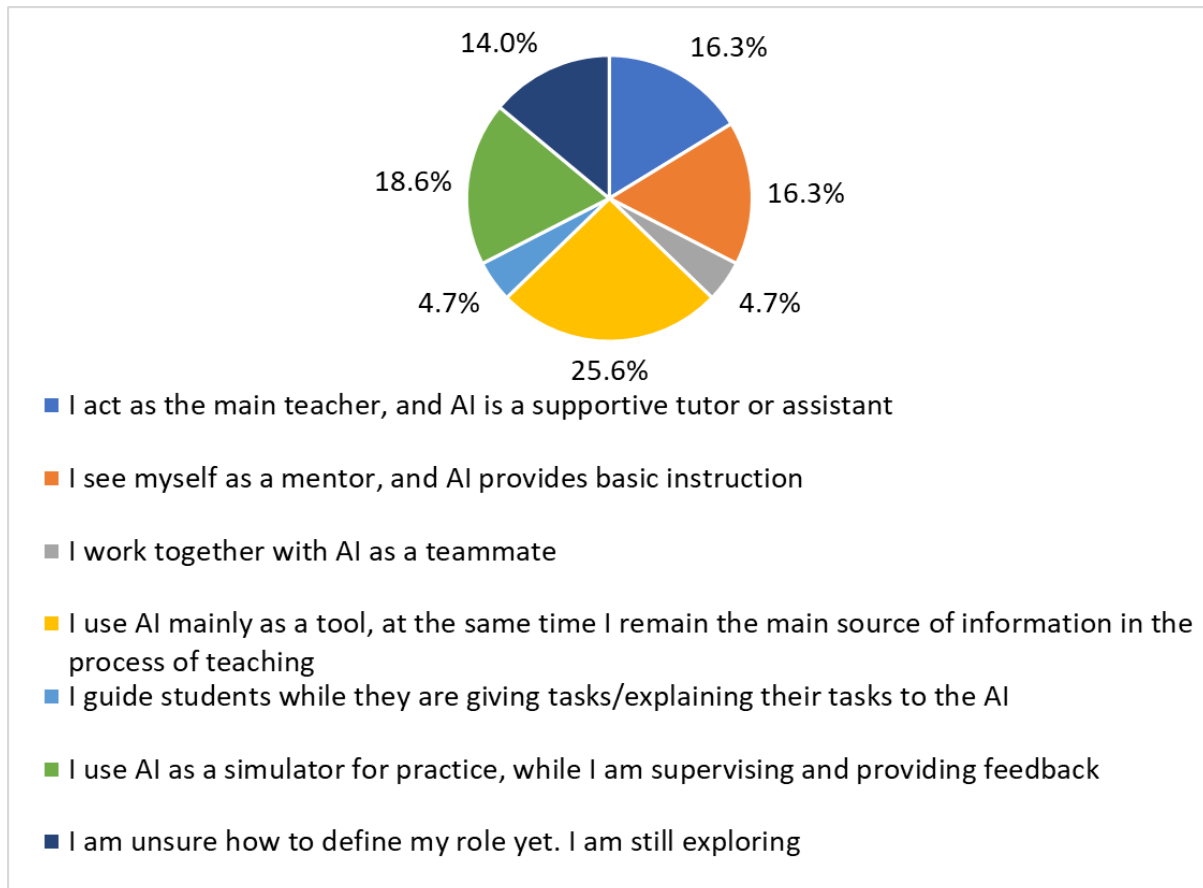


Figure 9: Lecturers' roles in AI-supported process of education: respondents' views (considering of own experience).

It is important to note that nearly half of all teachers surveyed (44.2%) are overcome with anxious thoughts and fears related to a teacher's leading role in the AI age. The exact number of respondents (44.2%) is not of concern in this regard. Only 5% of respondents (11.6%) expressed concern over this subject.

The following measures can be taken to avoid this anxiety. The most effective measure is to keep a balance between technology and human interaction. It is the opinion shared by the vast majority of the surveyed (60.5%). A clear AI policy that implies a close collaboration between international and national organisations and educational institutions is essential (46.5% of respondents think so) in eliminating anxious thoughts and fears related to a teacher's leading role in the AI age. A slightly smaller number of respondents (44.2%) believe that continuous training and support is a key to the question. Many teachers believe this is the government's responsibility (37.2%). It remains an open question for 23.3% of the respondents. 16.3% of the surveyed do not feel anxiety while teaching in an age of AI. Participants could choose more than one of the proposed measures for avoiding anxiety.

4.3. Finding the correlation coefficients

A correlation analysis was conducted on the survey results to identify potential statistical relationships among the respondents' answers. The following variables were included in the study: a level of

education, an academic degree (X1), teaching experience (X2), the use of AI in work (X3), attitude towards AI as a factor in improving education (X4), and feelings of anxiety about the role of a teacher in the AI era (X5). The results of the constructed correlation matrix generally demonstrated weak relationships between the indicated variables (table 4).

Table 4
Correlation matrix of survey results.

	X1	X2	X3	X4	X5
X1	1				
X2	0.437133	1			
X3	-0.06107	0.186101	1		
X4	-0.13856	-0.07321	0.443377	1	
X5	0.196903	-0.22289	0.056516	0.095724	1

The correlation coefficient of 0.44 between the use of AI in university educators' work and their attitude towards AI as a factor in improving education indicates a moderate positive relationship. This means that, in general, lecturers who frequently use AI in their professional activities tend to assess its potential for improving the quality of education more positively. However, this relationship is not particularly strong, as there are many exceptions among the respondents. Some lecturers actively use AI, but are sceptical about its educational value, and vice versa.

5. Conclusions

Based on the conducted literature review on the use of AI by lecturers in the teaching process, we determined seven roles that lecturers serve during the process of training with AI implementation: 1) a leading teacher, who explains new rules, guide students, and correct errors; 2) a mentor, who helps his mentee, supports critical thinking, explains the value of AI-generated content; 3) a teammate, whose work is accompanied by AI-powered resources; 4) a provider of information whose work is just assisted by AI in the process of teaching; 5) an assistant, who gives instructions while students are competing the tasks using the AI tools; 6) an instructor who carries out supervision and provides feedback; 7) an explorer who has not defined his role yet.

Research results confirm that lecturers mostly believe their role in AI is to be a reliable human-informed information provider. In this case, AI serves as a helpful assistant. However, the roles of an instructor (who uses AI as a simulator for practising task completion), a mentor (who uses AI to assist in preparing instructions), and a leading teacher (who uses AI as a supportive assistant) are also highly prioritised. Fewer participants think their role is to be a teammate or an assistant.

The study analysis showed generally weak relationships between lecturers' attitudes towards AI, the frequency of its use in professional activities and their chosen role in the educational model with the participation of AI. The highest correlation coefficient ($r = 0.44$) was observed between the frequency of AI use in teaching practice and its perception as a factor in improving the quality of education. This result indicates a moderate positive relationship: lecturers who more intensively integrate AI into their professional activities tend to demonstrate a more favourable attitude towards its educational potential. At the same time, the relationship is not strong enough, indicating significant variations in respondents' views: some actively use AI, despite a sceptical attitude towards its educational value, while others express positive assessments but rarely use these tools in practice.

Author contributions

Conceptualisation, methodology, visualisation, formal analysis, writing – review and editing, Kateryna P. Osadcha; project administration, supervision, resources, writing – review and editing, Viacheslav V. Osadchy; data curation, writing – original draft preparation, writing – review and editing, Volodymyr

V. Proshkin; data curation, writing – original draft preparation, writing – review and editing, Natalia V. Shumeiko.

All authors have read and agreed to the published version of the manuscript.

Funding

This paper was written within the project No. 09I03-03-V01-00045, which received funding from the EU NextGenerationEU through the Recovery and Resilience Plan for Slovakia.

Data availability statement

In this study, no new data were created. Data sharing is not applicable.

Conflicts of interest

The authors declare no conflict of interest.

Acknowledgments

The authors thank the survey participants for their invaluable input in the research. We greatly thank the lectures of the the following universities for participating in the survey and sharing their views: Drohobych State Pedagogical University of Ivan Franko, Borys Grinchenko Kyiv Metropolitan University, Ivan Franko National University of Lviv, Skovoroda Kharkiv National Pedagogical University, Municipal Establishment “Kharkiv Humanitarian-Pedagogical Academy”, National University of Life and Environmental Sciences of Ukraine, University of Lodz, Kyiv national University of Technologies and Design, Ternopil Volodymyr Hnatiuk National Pedagogical University, The Arctic University of Norway, Bohdan Khmelnytsky Melitopol State Pedagogical University, Khortyts’ka National Academy, University of the State Fiscal Service of Ukraine, Kherson State University, Kharkiv National Medical University, Poltava State Medical University, Vilnius University, Lutsk National Technical University, Poltava V.G. Korolenko National Pedagogical University, Vasyl’ Stus Donetsk National University, National Technical University “Kharkiv Polytechnic Institute”, Bratislava University of Economics and Business, Dmytro Motornyi Tavria State Agrotechnological University, Norwegian University of Science and Technology, The University of Western Norway (Norway), Zhytomyr Polytechnic State University, Nature research centre (Lithuania).

This paper is a part of the KEGA project “e-Portfolio as Pedagogy Facilitating Integrative Learning” (012EU-4/2023).

Declaration on Generative AI

In preparing this study, the authors used Scopus AI to search for articles in Scopus about the role of lecturers in the educational process using AI; Grammarly AI Writing Assistant for grammar and spelling check. After using these tools/services, the authors reviewed and edited the content as needed and take full responsibility for the publication’s content.

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A. Survey “AI in Education: A Questionnaire for Teachers, University Lecturers”

Section 1. The country and the university

1. The country You are working in...

- China
- Norway
- Poland
- Slovakia
- Spain
- Ukraine
- USA
- Other...

2. The university You are working for...

3. What is your field of work?

- Healthcare & Medicine
- Technology & Engineering
- Finance & Business
- Arts, Design & Media Science
- Law & Government
- Architecture & Engineering
- Culture & Entertainment
- Management & Administration
- Communications
- Community & Social Services
- Education
- Science & Technology
- Information Technology
- Law Enforcement & Security
- Hospitality & Tourism
- Environment & Agriculture
- Energy & Utilities
- Transportation & Logistics
- Manufacturing
- Mathematics
- Other...

4. What degree do you have?

- Master's degree
- PhD
- Post Doc or Doctor of Science
- Another

5. How long have you been working as a teacher / a university lecturer?

- not over 3 years
- 3-5 years
- of 5 to 10
- of 10 to 20
- more than 20

Section 2. AI in your teaching activity

6. Do you use AI in your teaching activity?

- Never
- Rarely
- Sometimes
- Often
- Always

7. To what extent do you agree with the following statement: "Integrating AI into teaching improves the quality of the learning process"?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Section 3. Is AI a “helper” of the teacher?

8. Which of the following AI’s roles do you find most relevant or useful in your class?

- AI-mentor: to provide feedback
- AI-tutor: to give direct instruction to students
- AI-coach: to encourage reflection and regulation, which improve learning outcomes
- AI-teammate: to increase team performance
- AI-student: students “teach” the AI about the topic by evaluating its output and explaining
- AI-simulator: to help students practice hard-to-practice skills in new situations
- AI-tool: to complete the tasks
- None of the listed
- Other...

9. How do you perceive your role as a teacher concerning AI in class?

If AI can act as a tutor, mentor, coach, teammate, tool, simulator, or student, what role do you see yourself taking on in this new learning environment?

Please choose the option that best describes your role:

- I act as the main teacher, and AI is a supportive tutor or assistant (I explain, guide, and correct. AI helps with examples or practice)
- I see myself as a mentor, and AI provides basic instruction (I help students reflect, think critically, and evaluate AI-generated content)
- I work together with AI as a teammate (We both support students in collaborative or group activities)
- I use AI mainly as a tool, at the same time I remain the main source of information in the process of teaching (AI helps complete tasks, but does not take on a teaching role)
- I guide students while they are giving tasks/explaining their tasks to the AI (AI as student) (This helps them deepen their own understanding)
- I use AI as a simulator for practice, while I am supervising and providing feedback (For example, AI chats for language practice or role-play)
- I am unsure how to define my role yet. I am still exploring.
- Other...

11. Do you feel anxious about your leading role as a teacher in the age of artificial intelligence?

- Yes
- Partially
- No

12. What do you think you need to do to avoid this anxiety?

- Clear AI policies – international and national organisations, educational institutions should implement clear rules for the use of AI to avoid abuse and ensure appropriate use of the technology.
- Continuous training and support – access to quality professional development programs that will allow you to master AI technologies, understand their benefits and limitations, and effectively integrate them into your teaching activities.

- Balance between technology and human interaction – AI should complement, not replace, the teacher, who remains the central figure in shaping the personality of the student.
- Open discussions and feedback – monitoring feedback from teachers, students, and administration on the impact of AI to ultimately identify problems and improve the implementation process.
- Guaranteeing job security – governments must understand that AI does not replace teachers but changes their functions, opening up new opportunities for professional fulfilment, such as in organising extracurricular activities, developing soft skills, etc.
- A feeling of anxiety while I am teaching in AI time – is not about me / I do not have it
- Other...