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CONTENT

PRE-SERVICE PRESCHOOL AND PRIMARY EDUCATION TEACHERS' POSITION TOWARD THE POTENTIAL OF ARTIFICIAL INTELLIGENCE TO ENHANCE UNIVERSITY LEARNING EXPERIENCE

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Abstract It is crucial to better understand pre-service teachers' positions regarding the application of artificial intelligence (AI) in university studies. Artificial intelligence (AI) can significantly enhance students', especially pre-service teachers', university learning experience; however, this technology also poses particular challenges. A qualitative empirical study was conducted to examine how pre-service preschool and primary school teachers evaluate the potential of artificial intelligence (AI) to enhance the university learning experience. Referring to quantitative content analysis, conducted on the responses of 112 students to an open-ended question, positive, negative, and neutral semantic units were identified, which were then grouped into subcategories and categories. Most of the students value AI as a helpful learning tool. AI helps to find the information more effectively, better understand complex material, organise work, and encourages creativity. Its potential for individualising learning is also emphasised. On the other hand, critical assessments are also becoming evident: students express concerns about the weakening of independent and critical thinking, the risk of academic dishonesty, and the reliability of information. Research reveals a complex attitude of students. AI is valued as an advanced tool, but also as a tool that requires responsibility. The results show that seeking purposeful AI integration in the study process requires increasing student and teacher AI literacy, strengthening ethical awareness, and applying balanced educational strategies.

Keywords: artificial intelligence (AI), informative-descriptive study, pre-service preschool teachers, pre-service primary school teachers, qualitative research.

Introduction

Technological advances, especially in the field of artificial intelligence, provide study process participants with new opportunities to seek study results and improve efficiency more effectively while studying at university. Artificial intelligence (AI) technologies have become the fastest-developing innovation in recent years, changing all areas of social life, including university studies. Artificial intelligence distinguishes itself in its great potential to integrate into teaching/learning processes. The tools and platforms of AI are becoming increasingly important. At the

same time, the application of technologies, competence, ethics, privacy, and other challenges arise. The application of artificial intelligence in study processes remains hard for many reasons: the competencies of teachers, their attitude, and students' skills in using such tools.

Empirical research reveals multifaceted attitudes of pre-service teachers toward AI. For example, Bae et al. (2024) research, after examining the attitudes of preschool teachers toward generative artificial intelligence (GenAI) tools, showed that although a small proportion of students were familiar with ChatGPT, only a small number intended to use this technology in their practice actively. The researchers linked this to still existing uncertainty that manifested itself in emotional reactions such as anxiety and concern (Bae et al., 2024). Research continually shows (Abualrob, 2025; Kalniņa et al., 2024; Karataş & Yüce, 2024) that although pre-service preschool and primary education teachers acknowledge the potential benefits of AI, anxiety is prevailing among them, linked to the threat AI poses to independent thinking, creativity, and academic integrity. These concerns are associated with fear regarding the future of the teaching profession and scepticism about AI reliability. Teacher education programmes incorporating AI literacy can enhance knowledge and increase confidence, but can also reveal or amplify these fears. This indicates that continual support, ethical discussions, and balanced integration strategies are necessary. The most important concern is that the use of artificial intelligence may undermine independent thinking, creativity, and critical thinking skills, leading to overreliance on AI-generated content (Hopcan et al., 2023).

A significant problem is that, although the number of studies on the general application of AI in education is growing, specific works devoted to the views of pre-service preschool and primary school teachers on various aspects are still underrepresented in the scientific literature. This lack of research limits the possibilities for a comprehensive understanding of how the most important teacher competencies are formed in the field of applying artificial intelligence technologies.

Thus, this research aimed to investigate how pre-service preschool and primary education teachers evaluate the potential of AI to enhance the university study experience.

Research Methodology

Design

A qualitative study was conducted. A quantitative content analysis is applied in the study. Such an approach involves coding text segments into subcategories and categories, focusing on hidden meanings and context (Drisko & Maschi, 2015). Qualitative research is a descriptive and inductive method, which aims to extract

meaning from the participants' attitude, and that helps exhaustively select and present data, using a holistic approach (Yıldırım & Simsek, 2011).

This is part of a complex study, the quantitative analysis results of which were published earlier (Lamanauskas & Makarskaitė-Petkevičienė, 2025). The study was conducted in March-April 2024 (during the spring semester).

Sample

The research sample consisted of university students in their first to fourth year of study, pre-service preschool and primary education teachers. Due to the homogeneity of the research population and sample, possible differences between variables by gender are not analysed. A total of 112 Vilnius University students participated in the study.

The study used a non-random, convenience sample. This sampling strategy was used because the population is relatively small, the study focuses only on university students of a defined profile, and the population itself is quite homogeneous. It can be argued that in studies with small, homogeneous populations (e.g., students), this strategy is often chosen, which is optimal and justified (Bornstein et al., 2013; Sedgwick, 2013).

Instrument

The study used open-ended questions. In a written survey, everybody was given the same questions. The researchers take the position that this is useful because it is sought to gain a deeper understanding of respondents' opinions or assess specific aspects. A series of open-ended questions was presented. This analysis presents the results based on one question:

- Do you think that artificial intelligence can enhance the learning experience at university?

In the study, students were asked to describe and comment on their position on the given question about the potential of AI to enhance the study experience. Strengthening the study experience at university means creating conditions in which students can gain not only academic knowledge but also personal and professional experience, feel valued, engaged in the study process, and motivated. This question is a component of a complex research instrument (Lamanauskas & Makarskaitė-Petkevičienė, 2025a, 2025b). Some of the research results were published earlier according to other research aspects (Lamanauskas, 2024; 2025b).

Data Analysis

Multiple readings of the extracted text array were performed. Identified semantic units are text segments that contain significant information. Taking into account the complexity of the variable, positive, negative, and neutral semantic units were distinguished.

In the subsequent analysis stage, similar semantic units were combined into larger groups (subcategories). They were evaluated and interpreted. In the final analysis stage, semantically close subcategories were grouped into categories. This provides opportunities to create a semantic structure that allows for a clearer understanding of the phenomenon under study. Such methods allow for a deeper analysis of the context and hidden meanings of the text (Koshorek et al., 2018). Content analysis as a method is a scientifically sound and effective solution that allows for drawing reasonable conclusions from various textual information sources. (Coners & Matthies, 2014). The studied content categories were then quantitatively evaluated by calculating absolute and relative frequencies in percentages.

Research Results

The respondents' position on AI's potential to enhance the university's study experience was analysed. Three categories were distinguished: *Improving the efficiency of the study process*; *Promoting creativity and ideas*; and *Individualisation and inclusion.* The results are presented in Table 1.

Table 1. Positive Evaluation of AI's Potential to Enhance the Study Experience.

Category	***N* (%)**	**Subcategory**	***N* (%)**	**Subcategory components**	***N* (%)**
Improving the efficiency of the study process	55 (51.0)	Information accessibility and speed	31 (28.9)	Helps to find information quickly	12 (11.5)
				Reduces time for searching answers and sources	8 (7.4)
				Speeds up task completion	6 (5.5)
				Helps to systemise information	5 (4.6)
		Assistance in the learning process	24 (22.1)	Makes it easier to understand complex topics or concepts	7 (6.5)
				Explains the material in other words	6 (5.5)
				Helps to prepare for written assignments	6 (5.5)

				Helps to check understanding of the topic	5 (4.6)
Promoting creativity and ideas	31 (28.6)	Generating creativity and ideas	21 (19.4)	Generates ideas and ways of solving	10 (9.3)
				Used in creative tasks	8 (7.4)
				Encourages thinking from new angles	3 (2.7)
		Practical benefit	10 (9.2)	Creates outlines, summaries	5 (4.6)
				Helps to prepare for presentations	3 (2.7)
				Creates learning tools	2 (1.9)
Individualisation and inclusion	22 (20.4)	Individualisation and accessibility	11 (10.3)	Provides the opportunity for	5 (4.6)

Note. 108 semantic units were extracted

As can be seen in the first table, the students' responses reveal that the vast majority see the potential of artificial intelligence (AI) in the study process. Students most often emphasise AI's ability to find information (11.5%) quickly, shorten the time for searching answers (7.4%), facilitate task completion (5.5%), and help systemise information (4.6%). This shows that AI is valued as a practical, time-saving tool. Efficiency and faster information retrieval are considered essential advantages during the studies. Also highlighted are aspects such as the ability of AI to help understand complex topics (6.5%), to explain the material in other words (5.5%), help with writing assignments (5.5%), and check understanding (4.6%). Thus, AI is considered an additional learning resource that strengthens understanding and ensures students are better prepared for their studies.

"Likely, this will significantly change not only the learning process itself but also the structure of assigned works. The format of interaction and communication will change" (A).

"AI can become an auxiliary tool for searching for information, preparing presentations, etc. Various AI applications used in lectures make the process more interesting" (C).

"Yes, I think it can be improved because using AI technologies, you can sometimes find information much faster than you would normally search for it yourself" (D).

"Artificial intelligence can be used for various creative tasks. To generate ideas, AI can be used to generalise various experiences. AI also provides an opportunity to acquire new knowledge and skills" (E).

On the other hand, students value AI as a source for generating ideas and as a means of developing creativity. However, this function is still less emphasized than the search for information. Practical applications of AI are especially significant, such as creating structured documents and visual materials. This is extremely useful but somewhat less emphasized than the information function. It is indicated that AI provides an opportunity to learn independently (4.6%), allows for getting faster feedback (1.9%), helps students with individual needs (1.9%), and allows for individualising teaching (1.9%). It is evident that students value AI as a tool that can help them adapt more flexibly to individual learning styles and needs.

Thus, it can be stated that students' position on using AI at the university is essentially positive and constructive. The results show that students view AI as a means of assistance and an essential component of the future learning process. However, successful AI integration requires awareness, competence development, and conscious application.

Negative semantic units (their information array) were also analysed. Two categories were reasonably distinguished: *Threats to independent thinking and academic integrity,* and *Information reliability and AI limitations.* The results are presented in Table 2.

Table 2. Negative Evaluation of AI's Potential to Enhance the Study Experience.

Category	***N* (%)**	**Subcategory**	***N* (%)**	**Subcategory components**	***N* (%)**
Threats to independent thinking and academic integrity	40 (64.6)	Loss of creativity and critical thinking	22 (35.5)	AI can inhibit creativity and self-expression	10 (16.2)
				Students think less critically if they rely on AI	7 (11.3)
				Use can discourage independent thinking	5 (8.0)
		Academic dishonesty	18 (29.1)	Students can abuse AI functions	8 (12.9)
				AI threatens the uniqueness of assignments	6 (9.7)
				May encourage cheating	4 (6.5)

Information reliability and limitations of AI	22 (35.4)	Information reliability	12 (19.3)	AI sometimes provides false and misleading information	5 (8.0)
				Not reliable as the only source of information	4 (6.5)
				Cannot always replace a live teacher's explanation	3 (4.8)
		Too much dependency	10 (16.1)	May discourage independent effort	7 (11.3)
				Students become dependent on technology	3 (4.8)

Note. 62 semantic units were extracted

The second table shows that the category *Threats to independent thinking and academic integrity* (64.6%) dominates. This category dominates among all negative insights, encompassing two essential threats: weakening of critical thinking and academic dishonesty. Students fear that AI may take away the opportunity to solve problems, reflect, or express individual attitudes independently. This criticism reveals concern that technology may reduce the quality of deep learning and personal intellectual growth. In addition, technology is considered ambiguous: although it helps, it can easily be exploited for unethical purposes. Using AI to generate written work or complete assignments can contribute to violations of academic rules, which threatens the value of university studies.

"Artificial intelligence is not conscious and therefore is not and cannot be creative. Thus, learning with AI would not encourage students' creative ideas, self-expression, and individual personal experience, which is important for the reflection and development of every person" (B)

"Overuse can reduce personal thinking ability" (G).

"I think it can improve, but the price is very high. Students will not think critically and creatively, they will just choose the easiest way" (E).

"Artificial intelligence possibly fastens the learning process; however, it does not reveal the student's abilities, and the student gets less experience, necessary for their profession (F).

The second, also quite significant category is *Information reliability and AI limitations* (35.4%). Namely, the limitations of the reliability and use of AI content are emphasised, as well as the risks associated with it. Students understand that AI is not an authoritative source, but an algorithmic source, the content of which does not always meet academic quality standards. It is also emphasised that a live teacher's explanation is more valuable than an automatic AI output. Fear about long-term consequences is also expressed. This is associated with the fact that AI can encourage a passive way of learning and reduce students' ability to overcome academic challenges independently without technological assistance.

Discussion

The research aimed to analyse pre-service preschool and primary education teachers' position on AI's potential to enhance the study experience at the university. Understandably, there is an increasing number of empirical studies examining how pre-service preschool and primary school teachers perceive the potential of AI to enhance university study experience. The results of the study showed that a specific dichotomous position is distinguished. Some respondents evaluate it positively, while a smaller part evaluates it negatively. A relatively small portion of respondents expresses a neutral attitude. As can be seen, the position that AI makes the study process more effective dominates in positive assessments. This includes the availability of information, the speed of its search, and assistance while studying. Other studies have shown similar results. For example, qualitative research involving 141 beginning teachers indicated that the application of AI, mainly in educational settings, led to various reflections on its use, highlighting both opportunities and concerns. (Karataş & Yüce, 2024). Another research which focused on language teachers working in preschool educational institutions, during a distance learning course, showed that the attitude toward AI is changing, and this indicates that the encounter with artificial intelligence and its practical use can have a positive influence on AI's integration into education (Uwosomah & Dooly, 2025). Comprehensive research conducted at the University of Latvia, which included 240 pre-service teachers from various disciplines, showed that less than half of them actively applied artificial intelligence during their studies. The benefits recognised are linguistic assistance and access to global knowledge, while the problems are concerns about reduced critical thinking and the risk of plagiarism (Kalniņa et al., 2024). Research shows that pre-service teachers value AI-assisted feedback through practical experience as an idea generation and teaching improvement catalyst. However, it should complement, not replace, human feedback (Schamber, 2025; Zaugg, 2024

The study also revealed some negative attitudes. The dominant position is associated with threats to independent thinking and academic integrity. First, it is a possible weakening of creativity and critical thinking, as well as academic dishonesty. Less than half of the respondents negatively value information reliability and AI limitations. Similar results were reported by other studies, showing that many pre-service teachers are concerned that using artificial intelligence can weaken creativity and critical thinking skills. Academic dishonesty, such as plagiarism, which is facilitated by artificial intelligence tools, is a significant concern (Hur, 2025; Pokrivcakova, 2023). The research also found that information reliability is a big concern. Moreover, there exists a possibility of over-reliance on technology. This is linked to the apparent limitations of AI. Similar results were presented in other studies. Students express doubts about the accuracy and reliability of artificial intelligence-generated information; therefore, disinformation and the need to critically evaluate artificial intelligence results are of great concern (Brianza et al., 2024). It was also found that anxiety and concern regarding social and ethical implications of using AI are factors that influence their intentions to use AI, and this shows that the attitude toward AI in the field of teacher preparation is complex (Sanusi et al., 2024).

This study has several significant limitations. First, the study was conducted with a small sample size, and therefore, the obtained results and conclusions are not generalizable. Various demographic factors were also not assessed. The study subjects were also students in a very defined field of study, namely, pre-service preschool and primary education teachers. Further studies should use a more diverse and larger sample size to improve external validity.

Conclusions and Implications

A study that analysed pre-service preschool and primary education teachers' attitudes toward artificial intelligence AI's potential to enhance the study experience at university revealed a multi-layered and dynamic position structure. The majority of students value the integration of AI into the study process positively. Particular emphasis is placed on aspects such as increasing efficiency, facilitating learning, promoting creativity, and individualisation. This shows that AI has the potential to effectively complement the study process if used thoughtfully.

Despite the prevailing favourability, significant negative assessments were revealed, which focused on two directions: the threat to independent and academic ethics, and information reliability limitations.

The students' attitude is not binary positive or negative – most emphasize benefits and risks. AI is perceived not as a "solution" but as a tool that requires

knowledge, responsibility, and criticality. In other words, the position multiplicity indicates the growing complexity of the perception of AI.

Successfully implemented integration of AI into university studies must be scientifically sound, ethically responsible, and educationally oriented, so that technology does not replace but enhances the quality of studies. Universities should promote technology integration as a system of study aids, develop digital skills, and provide teaching/learning guidelines for students.

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