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PAPER

Teachers' Attitudes towards AI in Teaching and Learning

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ABSTRACT

This study examines teachers' perceptions of artificial intelligence (AI) in education, focusing on perceived benefits and concerns. The sample comprised 550 teachers from five technical universities in the Czech Republic, and the study employed a quantitative approach. The findings indicate cautious optimism toward AI, with teachers assigning moderate to high importance to its educational role. AI is primarily associated with information access, continuous availability, and instructional support, while more advanced applications such as assessment and creative assistance are viewed as less central. Although many teachers report at least occasional use of AI—most commonly ChatGPT; however—adoption remains moderate and focused on improving instructional efficiency. At the same time, respondents express concerns about misuse, cognitive impact, and ethical governance. Teachers perceive a notable gap between their own ethical awareness and students' limited consideration of ethical issues when using AI, highlighting the need for clear policies, professional development, and ethical guidance to support responsible AI integration in higher education.

KEYWORDS

artificial intelligence (AI), education, technical university, AI benefits, AI concerns

1 INTRODUCTION

The integration of artificial intelligence (AI) in education, particularly in technical higher education (HE), has become an area of increasing interest and debate. Rapid advances in AI-driven systems, including intelligent tutoring systems, learning analytics, and large language models, are reshaping how knowledge can be delivered, assessed, and constructed in educational environments. In technical disciplines, where abstract concepts, problem-solving skills, and applied reasoning play a central role, AI technologies offer promising opportunities to support both teaching and learning processes.

From a pedagogical perspective, AI has the potential to enhance instructional practices by enabling personalized learning pathways, adaptive feedback, and real-time

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support tailored to individual students' needs. AI-based tools can assist teachers in diagnosing learning difficulties, visualizing complex technical phenomena, and scaffolding students' understanding of challenging subject matter. Moreover, the automation of routine administrative tasks such as grading, attendance tracking, or basic student inquiries may reduce teachers' workload and allow them to devote more time to instructional design, mentoring, and meaningful interaction with students.

Despite these potential benefits, the implementation of AI in higher education is neither automatic nor value-neutral. The successful integration of any technology depends largely on teachers, who act as key mediators between technological innovation and educational practice [1]. Teachers' attitudes, beliefs, and perceptions significantly influence whether modern technologies are accepted, meaningfully used, or resisted in the classroom. Factors such as perceived usefulness, ease of use, and alignment with pedagogical goals play a critical role in shaping teachers' willingness to adopt technology-supported teaching approaches.

Teachers in technical higher education face specific challenges related to AI adoption. These include concerns about the reliability and transparency of AI systems, the risk of over-reliance on automated tools, and the potential impact of AI on students' cognitive development, critical thinking, and academic integrity. Ethical considerations such as AI misuse, data privacy, bias, and accountability also place new demands on teachers, who must navigate not only technical but also pedagogical and moral dimensions of AI use.

In this context, understanding AI integration from the teacher's point of view is essential. Teachers are not merely end users of AI technologies but active decision-makers who interpret, adapt, and contextualize these tools within their instructional practices. Examining their experiences, expectations, and concerns provides valuable insights into the conditions under which AI can genuinely support teaching and learning in technical higher education. This perspective is crucial for developing effective implementation strategies, professional development programs, and institutional policies that align technological innovation with pedagogical objectives.

2 LITERATURE REVIEW

2.1 Teacher opinions on the use of AI in education: opportunities vs. challenges

Attitudes, as defined by I. Ajzen's Theory of Planned Behavior [2], refer to an individual's positive or negative evaluation of a particular behavior—in this case, the use of AI in teaching. According to this framework, the decision to adopt AI technologies is influenced by three primary factors: attitude towards the behavior, subjective norms (the perceived social pressure to engage in the behavior), and perceived behavioral control (the individual's belief in their ability to perform the behavior). For instance, if a teacher has a positive attitude towards AI, believes that their colleagues support its use, and feels confident in their ability to integrate AI tools into their teaching, he/she is more likely to adopt these technologies.

One of the major themes is the tension between the perceived opportunities and challenges that AI presents. Teachers who view AI as a potential asset to technical education tend to emphasize its capacity to offer personalized learning pathways, adapt to individual student needs, and support autonomous learning. AI can provide

instant feedback, generate simulations and models for complex technical tasks, and automate administrative functions such as grading, thereby freeing time for more interactive teaching practices. In this sense, AI can act as an enabler of innovative teaching practices, allowing educators to focus more on mentoring, guiding problem-solving, and fostering critical thinking. For example, [3] reports that AI tools are reshaping learning environments by enabling personalized instruction, automating feedback, and supporting academic writing, while [4] highlights the potential of AI to enhance student engagement and creativity. Furthermore, [5] and [6] argue that AI can democratize access to knowledge and improve learning outcomes.

On the other hand, some teachers may approach AI with skepticism or concern. Fear of job displacement is among the most frequently cited challenges. Some educators worry that AI could replace some aspects of their roles, particularly in areas such as assessment, tutoring, or content delivery [7], [8]. Concerns about the ethical implications of AI use, such as data privacy, algorithmic bias, or potential student academic dishonesty, are also significant for educators who strive to maintain fairness and equity in their classrooms [9], [10], [11], [12]. Moreover, the complexity of AI technologies may intimidate some teachers, especially those who lack familiarity with digital tools or adequate training to effectively integrate AI into their curricula [13], [14].

2.2 The influence of technological pedagogical content knowledge (TPACK) framework

To navigate these opportunities and challenges, the framework of Technological Pedagogical Content Knowledge (TPACK) provides a useful lens for understanding teacher attitudes toward AI integration in technical higher education [15]. TPACK highlights the intersection of three knowledge domains: technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). Teachers in technical fields must possess not only strong expertise in their subject matter but also an understanding of how to effectively integrate technology into their pedagogical practices [16].

In the context of AI, technical educators need to have an understanding of AI tools and their potential applications, while also considering how these tools align with the content they teach and the pedagogical approaches they employ [17]. Teachers who are familiar with the pedagogical potential of AI are more likely to see it as an asset rather than a threat, and they are better equipped to design AI-enhanced learning experiences. For example, in fields such as engineering, computer science, or robotics, AI-driven simulations and adaptive learning systems can be used to teach complex concepts in ways that traditional methods may not. Conversely, a lack of technological literacy or pedagogical strategies for integrating AI can create barriers to adoption, reinforcing resistance among teachers.

2.3 Social and institutional influences

Beyond individual attitudes, teachers' views on AI are also influenced by broader social and institutional factors. The organizational culture at the university plays a significant role in shaping teachers' willingness to experiment with new technologies. If the university promotes AI integration through professional development

programs, provides adequate resources, and fosters a supportive environment for experimentation, teachers are more likely to view AI as a tool to enhance their teaching. In contrast, a lack of university support or a focus on traditional teaching methods may lead to resistance or hesitation.

Moreover, societal perceptions of AI can impact teachers' attitudes. In contexts where AI is associated with technological progress and innovation, educators may be more inclined to embrace it as a valuable resource. However, in societies where there is a greater emphasis on human-centered teaching and skepticism towards automation, teachers may be more cautious about AI adoption.

2.4 Psychological influences

According to [18], barriers to technology integration can be categorized into first-order barriers, which involve factors such as knowledge and training, and second-order barriers, which are more complex and relate to teachers' personal characteristics, including their confidence and perceptions of the usefulness of technology in teaching and learning. This distinction highlights that the successful integration of AI in education depends not only on teachers' technical knowledge and skills but also on their emotional responses, such as joy, fear, and anxiety. Previous research indicates that teachers' readiness and confidence are critical determinants of technology adoption, with higher levels of technology self-efficacy being associated with greater likelihood of classroom integration. Thus, teachers' willingness to adopt AI in their instructional practices is also shaped by an emotional appraisal of its perceived benefits and the concerns it raises [19].

3 RESEARCH OBJECTIVE AND RESEARCH TOPICS

The aim of our study is to explore the teachers' attitudes towards AI in education, with a focus on their perceived benefits of AI and concerns about AI. In summary, it delves into the varying attitudes of technical university (TU) teachers towards generative AI, providing a holistic view of its perceived impact and reception in the educational landscape. By doing so, it aims to contribute to the rapidly growing body of knowledge on AI in education and support the development of policies and practices that enhance learning experiences worldwide.

Technical university teachers who participated in our survey shared their views on the following research topics:

Topic 1: Importance of AI in education
Identification of the teachers' general attitudes towards AI in education, including perceived benefits and concerns in their learning processes

Topic 2: Teacher familiarity with and use of AI in education
Assessment of current level of AI adoption in the academic activities of TU teachers and evaluation of the frequency and extent of AI technology usage among them

Topic 3: Ethical considerations of AI use in education
Identification of specific ethical barriers and considerations to AI adoption in education if/as seen by teachers

3.1 Research methodology

Our study employed a quantitative survey design to explore TU teachers' perspectives on several aspects of AI in higher education. Prior to data collection, ethical approval was obtained from all participating TUs in Czechia. The research was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki.

Questionnaire design and administration. A questionnaire was designed and administered within the framework of this study. Before designing the questionnaire, we defined the aim and scope of the study by revisiting relevant literature first. Then, we held interviews with several students to get more insight into their views on the issue. During the design, we drafted the questionnaire, including general instructions, personal information, and the questionnaire items themselves. In the introductory part, a short paragraph informed potential respondents about the researchers and the goal of the survey. Personal information enabled us to define the characteristics of the sample in terms of gender and faculty. The body of the questionnaire included 15 questions asking teachers to describe their opinions. Then, we asked for the opinions of two experts from each faculty, a total of sixteen, who had experience and expertise in AI use both in education and in questionnaire development. Considering experts' opinions, we deleted three items and modified the remaining 12 items. Also, we conducted a pilot implementation phase with students to check its intelligibility, and some items were modified based on their feedback. The final form consisted of 12 items, including close-ended and open-ended questions. The data collection process involved utilizing a Google Form questionnaire, which was distributed to teachers via email. The participants were provided with clear instructions and guidelines for completing the questionnaire, ensuring consistency in the data collection process.

3.2 Research participants

An invitation email was sent to all eligible teachers at TUs within the selected institutions. Convenience sampling was employed to recruit participants who were willing to take part in the study. In total, 606 TU teachers responded to the questionnaire. However, 56 respondents did not provide answers beyond the demographic section and were therefore excluded from further analysis. The final sample consisted of 550 TU teachers from five major TUs located in five different cities across the Czech Republic.

4 RESEARCH RESULTS

Overall, the data indicate that the sample is male-dominated (male teachers generally constitute the majority of academic staff in TUs), middle-aged, and highly experienced, which is consistent with workforce trends often observed in technical and vocational education (refer to Table 1). The strong representation of teachers with more than 15 years of experience suggests that the findings are likely informed by substantial professional expertise.

Table 1. Participant characteristics

Technical Teachers (n = 550)		Frequency	Percentage (%)
Gender	Man	393	71.5
	Woman	146	26.5
	Prefer not to say	11	2.0
Age	29 or less	27	4.9
	30–39	122	22.2
	40–49	196	35.6
	50–59	102	18.5
	60–69	67	12.2
	70 or more	30	5.5
	Prefer not to say	6	1.1
Teaching Experience	Less than 5 years	61	11.1
	6–10 years	93	16.9
	11–15 years	115	20.9
	More than 15 years	281	51.1

TU teachers provided their ideas on the following topics:

Topic I: Importance of AI in education

(Identification of the teachers' general attitudes towards AI in education, including perceived benefits and concerns in their learning processes)

Table 2 presents respondents' perceptions of the importance of AI in education on a 1–10 scale. The results indicate a generally moderate to high perception of importance. The largest proportion of respondents (48%, n = 264) rated the importance of AI between 5 and 6, suggesting that many view AI as moderately important in education. This is followed by 22% (n = 121) who rated AI highly, between 7 and 8, indicating a substantial group that recognizes AI as very important. A smaller percentage, 6% (n = 33), assigned the highest ratings (9–10), reflecting strong endorsement of AI's importance. In contrast, fewer respondents perceived AI as less important. Ratings between 3 and 4 accounted for 19% (n = 104) of responses, while only 5% (n = 28) selected the lowest range (1–2).

Overall, the findings suggest that most respondents acknowledge the relevance of AI in education, with a clear tendency toward moderate to high importance, while relatively few view it as having little significance.

Table 2. Perceived importance of AI in education on a scale of 1–10

Perceived Importance	Frequency	Percentage (%)
1–2	28	5
3–4	104	19
5–6	264	48
7–8	121	22
9–10	33	6

The results indicate that respondents perceive AI as having strong practical potential, particularly in supporting access to information and instructional preparation. The most frequently identified role of AI in education is as an information resource, selected by 62% (n = 340) of respondents (refer to Table 3). This highlights AI's perceived value in providing quick access to knowledge and explanations. Closely related, availability 24/7 was recognized by 60% (n = 328) of participants, emphasizing the importance of constant, on-demand support. An equally high proportion (60%, n = 329) identified lesson preparation as a key potential, suggesting that AI is widely viewed as a useful tool for educators' planning and content development.

Nearly half of the respondents (46%, n = 255) indicated tutoring support, reflecting recognition of AI's role in personalized learning and academic assistance. In contrast, more advanced or specialized applications were less frequently selected. Automatic assessment was chosen by 20% (n = 112), while inspiration for new ideas (16%, n = 89) and translation and stylistic support (14%, n = 76) received relatively lower endorsement. Finally, 12% (n = 66) of respondents selected other potentials, indicating that some participants perceive additional or alternative uses of AI beyond the predefined categories. Overall, the findings suggest that respondents primarily associate AI in education with information access, continuous availability, and instructional support, while more complex functions such as assessment and creative assistance are viewed as less central at this stage.

Table 3. General potentials of AI in education

Response	Frequency	Percentage (%)
Information resource	340	62
Availability 24/7	328	60
Lesson preparation	329	60
Tutoring support	255	46
Automatic assessment	112	20
Inspiration for new ideas	89	16
Translation + stylistics	76	14
Other	66	12

Table 4 summarizes respondents' perceptions of the main risks associated with the use of AI in education. Overall, the results indicate that concerns are primarily focused on student behavior and pedagogical impact, rather than purely technical issues. The most frequently cited risk is student misuse, identified by 60% (n = 328) of respondents. This suggests widespread concern that students may use AI inappropriately, for example, for plagiarism or bypassing learning processes. The second most common concern is over-reliance on technology, selected by 46% (n = 255), reflecting fears that excessive dependence on AI could diminish students' autonomy and learning skills.

Closely related, 42% (n = 237) of respondents indicated a reduction of critical thinking as a significant risk, highlighting apprehension that AI use may negatively affect students' ability to analyze, reason, and solve problems independently. Technical and ethical concerns are also prominent, with data privacy concerns reported by 38% (n = 211) of participants, underscoring anxieties about the security and handling of personal and educational data. Institutional and instructional challenges were mentioned less frequently but remain notable. Lack of proper training of teachers was identified by 32% (n = 176), suggesting that insufficient professional

development may hinder effective and responsible AI integration. Similarly, low supervision and guidance was selected by 28% (n = 155), indicating concerns about inadequate oversight of AI use in educational contexts.

Finally, 16% (n = 87) of respondents selected other risks, implying the presence of additional concerns beyond the predefined options. Overall, the findings suggest that while respondents recognize the potential benefits of AI in education, they also express substantial concern about misuse, cognitive impact, and governance, highlighting the need for clear policies, teacher training, and ethical guidelines to ensure responsible AI adoption.

Table 4. General risks of AI use in education

Response	Frequency	Percentage (%)
Student misuse	328	60
Over-reliance on technology	255	46
Reduction of critical thinking	237	42
Data privacy concern	211	38
Lack for proper training of teachers	176	32
Low supervision and guidance	155	28
Other	87	16

Topic II: Teachers' familiarity with and use of AI in education

The distribution of responses indicates that the behavior or practice under investigation is generally infrequent among respondents. Nearly half of the participants (48.64%) reported engaging in it occasionally, while a substantial proportion (38.66%) indicated that they rarely do so (refer to Table 5). Together, these two categories account for over 87% of responses, suggesting limited or irregular engagement overall. Only a small minority of respondents reported frequent use: 8.71% selected "often" and just 1.27% "very often". In contrast, 2.72% indicated that they never engage in the activity. This pattern suggests that while complete non-use is relatively uncommon, consistent or habitual use remains limited.

Overall, the findings point to a cautious or emerging adoption rather than widespread or systematic practice, with most respondents occupying a middle ground between rare and occasional engagement.

Table 5. Usage of AI tools in academic activities

Category	Frequency	Percentage (%)
Never	15	2.72
Rarely	213	38.66
Occasionally	268	48.64
Often	48	8.71
Very often	7	1.27

The results concerning the use of AI tools by technical teachers reveal that ChatGPT (OpenAI) is the most prevalent tool, selected by 298 (51.5%) teachers (see Table 6). This majority recommends that ChatGPT act as the starting point for AI implementation in academics. ChatGPT is followed by Microsoft Copilot (11.9%)

and Google Gemini (8.5%) with comparatively low scores. Together, these three main tools cover around 70% of all reported AI tools, highlighting a high focus of use within a few commercially dominant systems.

Table 6. Which tools do you use?

AI Tool/Category	Frequency	Percentage (%)
ChatGPT (OpenAI)	298	51.5%
Microsoft Copilot	69	11.9%
Google Gemini	49	8.5%
DeepL (Translation & Grammar)	29	5.0%
Perplexity AI (Search/Research)	24	4.1%
Scite.ai (Citations/Research)	20	3.5%
Claude AI (Anthropic)	15	2.6%
Grammarly (Writing Assistant)	14	2.4%
Consensus/Elicit (Research Analysis)	15	2.6%
Deepseek	7	1.2%
Others (Canva, Gamma, Midjourney, etc.)	39	6.7%

The results regarding the purpose for which the technical teachers use AI tools show that the most common application is the preparation of presentations (17.61%). Similarly, the other key areas of AI use by technical teachers include the summarization of complex texts (17.04%), new research inspiration (12.92%), quizzes and tests generation (12.20%), AI-generated material explanation (11.71%), new concepts learning (10.34%), lesson planning (9.29%), and detection of plagiarism and AI content (8.89%), as listed in Table 7. These results reveal that AI adoption in technical teachers is diverse, currently focusing on improving the clarity and speed of instructional design and basic research conceptualization.

Table 7. Purpose of use

Purpose	Frequency	Perceived (%)
Preparation of presentations	218	17.61
Summarizing texts	211	17.04
New research inspiration	160	12.92
Creating assessment content (Quizzes/Tests)	151	12.20
AI-generated content explanation	145	11.71
Learning new professional concepts	128	10.34
Lesson planning	115	9.29
Plagiarism & AI content detection	110	8.89

The analysis of AI adoption among colleagues demonstrates a general trend towards using these AI tools, although the frequency of this use is moderate to low. A significant number of teachers perceive their colleagues employing AI tools as either “rarely” (38.66%) or “occasionally” (48.64%), as listed in Table 8. While a small

portion of teachers observed to "never" (2.72%) use AI tools indicates that complete non-engagement with the technology is now very rare.

Table 8. Use of AI tools by colleagues

Category	Frequency	Percentage (%)
Never	15	2.72
Rarely	213	38.66
Occasionally	268	48.64
Often	48	8.71
Very often	7	1.27

The results regarding the teachers' colleagues' belief in the potential of AI tools in teaching and learning show that most of the teachers (81.7%) selected "high" and "moderate" levels as compared to the "moderate" and "low" levels with 67.7% scores (see Table 9). These results demonstrate that colleagues seem ready to use AI tools in their future.

Table 9. Teachers' perceptions of their colleagues' beliefs in the potential of AI tools for teaching and learning

Category	Frequency	Percentage (%)
Very high	34	6.2
High	121	27.3
Moderate	307	54.4
Low	75	13.3
Very low	27	4.8

Topic III: Ethical Considerations

(Identification of specific ethical barriers and considerations to AI adoption in education if/as seen by teachers).

A strong majority of respondents (77%) indicated that students never or rarely consider ethical issues when using AI for assignments (see Table 10), suggesting that ethical reflection is largely absent from students' AI-related academic practices, according to teachers' perceptions. A smaller proportion of respondents (15%) reported that students sometimes consider ethical issues, indicating occasional awareness but a lack of consistent ethical engagement. Only a very limited group (8%) stated that students often or very often consider ethical implications, demonstrating that regular ethical consideration remains uncommon among students.

Table 10. Students' consideration of ethical aspects when using AI tools

Category	Frequency	Percentage (%)
Never	352	64
Rarely	71	13
Sometimes	83	15
Often	33	6
Very often	11	2

The findings indicate a high level of ethical consideration among teachers. A strong majority of respondents (77%) report that their colleagues "often" or "very" often consider ethical issues concerning students' use of AI (refer to Table 11). This suggests that ethical implications of AI are a prominent concern within the teaching staff. A smaller proportion (14%) perceive that ethical issues are considered only sometimes, while very few respondents (9%) believe that their colleagues never or rarely address ethical concerns.

Overall, the results suggest that teachers largely recognize and actively consider ethical issues related to students' use of AI. When contrasted with student-reported behavior, these findings may indicate a gap between educators' ethical awareness and students' ethical practices, highlighting the importance of aligning ethical expectations, communication, and instruction regarding AI use in educational contexts.

Table 11. Colleagues' (teachers') consideration of ethical aspects of student AI use

Category	Frequency	Percentage (%)
Never	17	3
Rarely	33	6
Sometimes	77	14
Often	319	58
Very often	104	19

The results concerning teachers' reactions to students' AI use demonstrate a strong shift toward "conditional acceptance" (75.9%), revealing that most teachers consider AI an acceptable aid to maintain academic integrity and student understanding (refer to Table 12). Some portion (16.4%) of the teachers keeps a "positive" view, encouraging the proper use of AI tools as a future need, while a small number (0.9%) is strictly "negative" in this regard. Consequently, these findings suggest that the key ethical barrier is not the technology itself but rather the personal effort and accountability related to its use, as about 92% of teachers now encourage or accept the use of AI in the right conditions.

Table 12. Details of teachers' reaction against the students AI use in academic activities

Category	Frequency	Percentage (%)	Educator View
Conditional acceptance	412	75.9%	"It's okay if they understand the result, cite the tool, and can defend their work."
Positive/ encouraging	89	16.4%	"I welcome it; it's a modern tool like a calculator. I praise students who use it correctly."
Neutral	37	6.8%	"I don't mind," "I don't track it," or "I have no experience with this yet."
Negative/ discouraging	5	0.9%	"I require personal effort only," or "I view it negatively if it replaces thinking."

5 DISCUSSION

The findings indicate that the participating technical teachers were predominantly male, middle-aged, and highly experienced, reflecting workforce patterns

commonly reported in technical and vocational higher education. The strong representation of teachers with more than 15 years of experience suggests that the results are informed by substantial professional expertise, lending credibility to respondents' evaluations of AI's role in education.

Overall, teachers perceive AI as moderately to highly important, with most respondents acknowledging its relevance while expressing measured optimism rather than uncritical enthusiasm. This balanced perception aligns with the experienced profile of the sample, suggesting that attitudes toward AI are shaped by practical pedagogical considerations rather than novelty. Teachers primarily associate AI with supportive and efficiency-oriented functions, particularly access to information, continuous availability, and lesson preparation. These findings indicate that AI is currently viewed as a complementary tool that enhances instructional planning and access to knowledge, rather than as a substitute for teaching or a driver of fundamental pedagogical change.

Despite recognizing its potential, respondents expressed notable concerns regarding AI-related risks. The most prominent issues relate to student misuse, overreliance on technology, and reduced critical thinking, highlighting apprehension about AI's impact on learning processes rather than technical limitations alone. Ethical and governance concerns, including data privacy and insufficient teacher training, further underscore the need for institutional frameworks to support responsible AI integration.

In terms of practice, most teachers report using AI tools occasionally or often, indicating widespread but moderate adoption. AI is mainly employed for presentation preparation, text summarization, research inspiration, and assessment-related tasks, suggesting that current use focuses on improving efficiency and clarity in instructional design. Perceptions of colleagues' AI use reflect a similar pattern, with AI increasingly normalized but not yet fully embedded in everyday academic practice. Notably, teachers express strong confidence in AI's future potential, revealing a gap between current use and anticipated adoption.

A key finding concerns the divergence between teachers' and students' ethical engagement with AI. While teachers report high levels of ethical consideration regarding students' AI use, students themselves rarely reflect on ethical implications. This mismatch highlights a critical need for clearer communication, explicit instruction, and institutional guidance on ethical AI use. Teachers' responses to student AI use further support this interpretation, as most adopt a stance of conditional acceptance, emphasizing responsible use, transparency, and accountability rather than outright restriction.

Overall, the findings portray technical teachers as cautiously optimistic and pragmatically engaged with AI. While they recognize its educational value and are increasingly integrating it into their practice, concerns about misuse, cognitive impact, and ethical awareness, particularly among students, remain central. These results highlight the importance of targeted professional development, clear institutional policies, and explicit ethical education to ensure that AI adoption in technical higher education is both effective and responsible.

6 CONCLUSION

This study provides empirical insight into technical university teachers' attitudes toward artificial intelligence in higher education, based on a large sample of 550 respondents from five Czech technical universities. The findings indicate that teachers adopt a position of cautious optimism: they acknowledge AI's growing

relevance and practical utility, yet simultaneously express concerns regarding its pedagogical, cognitive, and ethical implications.

AI is primarily perceived as a supportive and efficiency-enhancing tool, particularly for information access, lesson preparation, and instructional clarification. More transformative applications, such as automated assessment or creative co-generation, remain secondary in teachers' perceptions. This suggests that AI integration in technical higher education is currently incremental rather than disruptive.

A central finding of the study is the tension between perceived benefits and perceived risks. While most teachers report at least occasional use of AI tools—most commonly ChatGPT—concerns about student misuse, over-reliance on technology, and reduced critical thinking remain prominent. Importantly, the results reveal a notable discrepancy between teachers' strong ethical awareness and their perception of limited ethical reflection among students. This gap highlights the urgent need for clearer institutional policies, structured guidance, and explicit ethical instruction related to AI use.

From a theoretical perspective, the findings contribute to the growing body of research on AI in education by contextualizing teacher attitudes within technical higher education environments. The study reinforces the relevance of frameworks such as TPACK and the Theory of Planned Behavior in explaining AI adoption while emphasizing the role of professional experience and institutional culture.

From a practical standpoint, successful AI integration requires more than technological availability. Higher education institutions should prioritize targeted professional development, support reflective pedagogical practices, and establish transparent ethical standards for AI use. Rather than replacing educators, AI should be positioned as a complementary system that enhances instructional quality while preserving human judgment, critical inquiry, and academic integrity.

In conclusion, technical university teachers appear prepared to engage with AI in responsible and pedagogically meaningful ways. However, sustainable and effective integration will depend on balancing innovation with ethical accountability and educational purpose.

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