# Perceptions and Perspectives: Understanding Teachers' Attitudes Towards AI in Education

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## Abstract

*The integration of Artificial intelligence (AI) in education is a complex process that is deeply influenced by teachers' attitudes towards its adoption. This paper examines Slovenian post-secondary teachers' perceptions of AI, focusing on their perceived benefits and concerns related to the use of AI in education. Based on a mixed-methods approach of survey and interviews, it reveals cautious optimism amongst teachers. In particular, teachers recognise the potential of AI to assist them in their work, create educational materials and engage students. However, their enthusiasm is tempered by concerns about ethical issues and data privacy. The paper highlights the importance of addressing these concerns through transparent and ethical AI development, supportive policies, and professional learning opportunities to create an enabling environment for AI in education.*

**Keywords:** artificial intelligence, teachers, attitudes, education, educational technology.

## INTRODUCTION

The rapid development of artificial intelligence (AI) is changing many sectors, with education standing at the forefront of this transformation. The current state of AI in education reflects a growing adoption trend as educational institutions explore various AI tools to enhance teaching and learning. Today, at a relatively early stage in the widespread use of AI in education, when no one really knows where these developments will lead, how effective AI tools are in education, or what future steps teachers should take, as there is still very little research, guidelines and policies in the subject, it is not surprising that teachers have many questions and very few answers (Fullan et al., 2023). With its ability to process large amounts of data, analyse learning patterns and make intelligent decisions, AI holds enormous potential to revolutionise teaching and learning practices, making them more personalised, engaging and efficient (Kumar et al., 2023). Various studies increasingly show that AI technologies may provide new opportunities to personalise learning experiences, accelerate learning, optimise administrative tasks, improve teaching strategies and even increase student performance and learning outcomes (Banerjee, 2023; Chiu et al., 2023; European Commission, 2023; Huang et al., 2021; Kumar et al., 2023; Lin, 2022; Yildirim et al., 2021).

Teachers play a crucial role in using AI technology in classrooms (Cukurova et al., 2023; Nazaretsky et al., 2022; Pokrivcakova, 2023). However, integrating AI tools into education undoubtedly requires teachers to make additional efforts to adapt their teaching strategies, to use their professional judgement on how to include them in the classroom, and to assess students' knowledge as AI products become more sophisticated and easily accessible (Fullan et al., 2023, p. 3). In European policy documents, teachers are expected to know how to use AI technology to prepare and deliver lessons (European Commission, 2020, 2023), but the question is whether they will do so and what are the key factors preventing them from doing so. Some studies show that teachers' willingness to adopt AI is slower than in other areas (Kaplan-Rakowski & Grotewold, 2023) and that although teachers see AI as a potentially powerful means of improving their teaching, they may avoid incorporating it into their daily teaching routines (Nazaretsky et al., 2022).

Research on technology integration in education has shown that "technology adoption and technology use by teachers are moderated by a variety of factors, comprising external (first-order) factors such as access, school support, provision of professional development, and internal (second-order) factors such as teachers' attitudes, concerns, technological competence and beliefs" (Burke et al., 2018, p. 1). Similarly, Ertmer et al. (2012, p. 423) identified first-order barriers to technology integration, which include external factors such as training and support, and more challenging second-order barriers, which are teacher-related and include teachers' confidence, beliefs about how students learn, and the perceived usefulness of technology in the teaching and learning process. The significance of this is the recognition that the successful integration of AI in education depends not only on teachers' knowledge and skills, but also on their attitudes, acceptance, and confidence in the technology. Indeed, teachers' perceptions of AI play a crucial role in shaping their willingness to incorporate AI technologies into their teaching practices (Nazaretsky et al., 2022). Teachers' readiness and confidence to use technology have been reported as key factors in technology integration, and teachers with higher levels of technology self-efficacy (i.e., a high belief in their ability to use technology) are more likely to integrate technology in their classrooms (Yurtseven Avci et al., 2020). This means that teachers' perceptions and perspectives on the benefits and concerns associated with AI are important. In other words, teachers' willingness to integrate AI into their teaching practice depends on a pragmatic decision about how much they expect to benefit from it and how many concerns they have about it.

The aim of this paper is to explore the teachers' attitudes towards AI in education, with a focus on their perceived benefits of AI and concerns about AI. Drawing on the data from the Artificial Intelligence for and by Teachers (AI4T) project that was implemented in five European countries (Slovenia, France, Italy, Luxembourg and Ireland) between 2021 and 2024, it presents insights into the diverse perceived benefits and challenges of AI among post-secondary teachers in Slovenia. Through this exploration, the paper intends to highlight the significance of understanding and addressing teachers' concerns. This understanding is critical for fostering a positive and open attitude towards adopting AI in educational settings, which is essential for realising the full potential of AI in education and preparing students for a future intertwined with AI.

**METHODOLOGY**

The study uses a mixed-methods research design that integrates qualitative and quantitative approaches to gather comprehensive data on the attitudes towards AI of post-secondary teachers who participated

in the AI4T project and its professional learning pathway in Slovenia. It employs two research instruments, an online questionnaire and interviews, and relies on teachers' self-reported data from these instruments. The data used in this paper is largely based on the analysis prepared by Bezjak and Mirazchiyski (2023) for the AI4T project evaluation report.

Quantitative data was collected using a questionnaire designed to evaluate teachers' attitudes towards AI, including their perceived benefits and challenges, ethical concerns, ease of use, and usefulness of AI. The questionnaire was administered online in April 2023. It was completed by 257 teachers (the response rate was 95.5%) from 76 post-secondary general and vocational or technical schools, which corresponds to about 50% of the total number of post-secondary schools and 4% of all teachers teaching at the post-secondary level in Slovenia. The questionnaire sample consisted mainly of female teachers (79.0%) with an average teaching experience of 16.8 years. It included a significant number of mathematics teachers (44.36%) and foreign language teachers (35.8%), as well as smaller percentages of computer science teachers (3.89%) and teachers of other subjects (15.95%). The participants came from a variety of school types, including academic schools (36.2%), vocational schools (43.6%) and mixed-type schools (20.2%). The sample, which consisted mainly of targeted mathematics and foreign language teachers, is not considered representative of Slovenia's general population of teachers. Teachers participated in the project voluntarily, which could imply various biases, such as a strong interest in AI technology.

Qualitative data was collected through semi-structured interviews with a subset of 18 teachers (nine mathematics teachers, eight foreign language teachers and one physics teacher) who participated in the AI4T project's professional learning pathway. The interviews covered topics similar to those covered in the questionnaire but allowed teachers to share their detailed perceptions and perspectives, complementing the quantitative data collected through the questionnaire. The characteristics of the participants in the interview sample differ slightly from those of the questionnaire sample. The interview sample comprised teachers with comparatively more teaching experience (21.5 years) and had a higher percentage of female teachers (83.3%), mathematics (50.4%) and foreign language teachers (44.4%), and teachers from academic schools (50.0%) than the questionnaire sample.

The quantitative data presented were analysed using descriptive statistics. Data from the interview transcripts were systematically categorised and thematically analysed using NVivo 12 software. Open-ended answers in the questionnaire were also treated as qualitative data.

**RESULTS**

**Teachers' perceived benefits of AI in education**

According to the data, Slovenian teachers have a positive attitude towards AI. In the questionnaire, 86.8% of the participating teachers expressed their excitement to learn about AI. Most of them, 77.8%, enjoy using AI tools, and an overwhelming 95.9% found it stimulating to use AI tools. In addition, 70.4% of teachers enjoy teaching lessons in which their students use AI tools. The AI enjoyment scale, calculated from the above items, has a relatively high score of 5.35 (SD 1.08) on the 7-point Likert scale. This reflects a high level of enthusiasm and acceptance of AI among teachers, suggesting that they recognise the potential of AI in education and are open to exploring the challenges and opportunities

that AI offers in education. Similarly, data extracted from the interviews showed that 77.8% of the teachers interviewed reported having a positive attitude towards AI.

Teachers identified several aspects of education where AI can be beneficial. The perceived usefulness of AI in assisting them in their professional work is high, with 86.8% of participating teachers indicating in the questionnaire that they generally agree that AI would be helpful in their work, underlining the perceived utility across various teaching and administrative tasks. Specifically, 91.0% saw AI as beneficial for administrative tasks, 87.1% for creating educational materials, 79.7% for correcting exercises, homework and tests, 84.4% for monitoring students, 81.3% for identifying areas to improve their teaching, 71.9% for encouraging student collaboration, and 70.7% for motivating and engaging students. This means that AI is appreciated among Slovenian teachers for its ability to automate some tasks, such as grading and tracking attendance, and to help them prepare and deliver lessons. They also see AI as a powerful tool to increase students' interest and motivation in learning. It is not surprising, therefore, that 74.4% of teachers indicated in the questionnaire that they actually use AI to create, present or share lessons, exercises, homework or tests.

Nearly half of the teachers (47.7%) agreed that integrating AI into education would improve the quality of teaching. A significant number of teachers expected AI to reduce educational inequalities and discrimination (40.2%) and to take over routine tasks (39.1%), giving them more time to focus on student learning and interact directly with students. As a result, 45.3% of teachers believed that their teaching would be more personalised to meet the individual needs of each student. However, only 22.3% believed that AI would improve students' academic success.

In the interview, a mathematics teacher exemplified the practical benefits AI can provide in the classroom:

*I think there is a lot that AI can contribute. For example, when I used AI, I felt like I had an extra teacher in the classroom. And that is really a big benefit for me. I mean, I can't be available to 30 students at the same time /.../ when they can ask AI something /.../ so they're not just waiting for me /.../. That's a big thing for me. But it's true that with AI alone, without a teacher, it would probably be difficult. But yes, it can be a great help.*

On average, teachers in Slovenia feel moderately to highly comfortable and confident with AI technology. Their perceived ease of use of AI was medium to high, with an average score of 4.81 (SD 1.13) on a scale of 1 to 7, where 1 is a low and 7 is a high perceived ease of use. This means that they believe that using AI technology is a relatively straightforward task for them. More specifically, 61.9% of participating teachers found it easy to learn how to use AI tools, while 69.6% found it easy to use AI tools. In addition, 70.8% felt that they could easily become proficient in using these tools, and 52.5% felt that it was easy to get AI tools to do what they wanted them to do. The relatively high scores for the perceived ease of use and confidence in becoming proficient in using AI tools suggest that teachers are not only willing to integrate AI into their teaching practice, but also feel capable of overcoming the initial learning curve associated with these technologies. The positive attitudes towards AI, combined with the high levels of comfort and confidence in using AI technology, provide a promising outlook for teachers' acceptance and willingness to adopt AI technologies in educational settings.

**Teachers' concerns related to AI**

According to the questionnaire, teachers' concerns and worries about integrating AI into their work are relatively low. The average score on the AI anxiety scale, where 7 is the highest score, was 2.95 (SD 1.40). 21.4% of teachers feel anxious while learning to use AI tools, 17.9% feel anxious while using AI tools, and 11.3% feel anxious when conducting classroom sessions with students using AI tools. 30.7% were worried about making mistakes when using AI tools, and 16.3% were concerned about AI tools malfunctioning while they or their students were using them.

Teachers expressed much higher levels of concern in their responses to the open-ended question asking them to specify their feelings about AI. As much as 40.2% of teachers mentioned at least one feeling or emotion that was categorised as anxiety about AI (such as fear, worry or distrust). Among the reasons for their AI-related apprehension, the most frequently expressed concerns in the questionnaire were teachers' lack of familiarity with AI tools and ethical concerns about using AI, especially with students. On the other hand, in the interviews, many teachers linked their apprehension also to the educational implications of AI, the lack of pedagogical strategies for effectively integrating AI into education, and concerns about how AI tools might affect their teaching methods, assessment, and student cheating. All of this illustrates the complex emotional landscape that teachers are navigating in the context of AI integration.

Ethical considerations form a significant part of the discourse, with teachers particularly concerned about data privacy and security. In general, teachers have a strong ethical awareness regarding the use of AI technology. 71.4% of them reported having a good understanding of ethical issues, while 82.4% indicated that they always comply with ethical principles when using AI tools. However, 62.5% of them are concerned that students' personal information could be breached or used for unauthorised purposes. In addition, more than half of them believe that private companies will have an increasing influence in schools (52.7%) and that surveillance in schools will increase (54.7%). Furthermore, analysis of the interviews reveals that, in practice, ethical considerations are emerging as one of the most essential factors in prompting teachers to think critically about AI, leading to a more cautious and deliberate approach to integrating AI into their teaching.

Beyond the numerical data, however, the teachers' narrative responses in the interviews provided a profound insight into the depth of their concerns. In particular, two foreign language teachers captured the essence of these concerns, illustrating the practical and philosophical dimensions of integrating AI into educational settings. One teacher eloquently expressed concerns about the growing dependency on AI technology, highlighting the potential loss of basic skills, while another teacher echoed this sentiment from a different angle, raising a critical point about the reliability of the information generated by AI:

*I'm concerned about this feeling of dependency on technology when you cannot do anything by yourself. I mean, I give you a piece of paper and a pencil, so now write something or create something. That's what I feel is happening, /.../ that we won't write anymore. That worries me more than the surveillance, although it is also possible that someone could misuse our data.*

*The most considerable risk of using AI in education is that we don't check the information. Students need to be made aware of this. We're working on that, but students think it's all fine. But you always have to check /.../ because not all information is relevant.*

Contrary to some popular beliefs, most post-secondary teachers in Slovenia do not think that AI will negatively impact relationships between teachers and students (72.3%), nor do they believe that education will be dehumanised (71.7%). Very few teachers also agreed with the statements that the teaching profession would be devalued (16.8%) and that teachers would gradually be replaced by AI (7.1%). This suggests that teachers recognise AI as a tool that, if implemented thoughtfully, can augment rather than undermine the educational process. But, on the other hand, a notable proportion of the teachers (37.9%) felt that they would be overwhelmed by learning about AI. However, this points to the need for adequate support and resources to ensure that teachers feel equipped and confident to navigate this new educational landscape.


## DISCUSSION AND CONCLUSIONS

The findings show that post-secondary teachers in Slovenia are aware of the transformative potential of AI. They are particularly enthusiastic about AI's ability to assist with administrative tasks, create educational materials, and provide targeted support to students. This positive perception is crucial as it lays the groundwork for wider acceptance and integration of AI in educational settings. However, this optimism is not without its reservations. The apprehensions surrounding ethical considerations, particularly data privacy and security, reflect a broader societal dialogue on the implications of AI. Moreover, the concerns related to teachers' feelings that they are not proficient enough with AI tools highlight a critical area for policy intervention and professional support to equip educators with the competencies and confidence to effectively navigate the complexities of AI technologies.

In general, the attitude of Slovenian teachers towards AI in education can be described as cautiously optimistic. This means that the teachers in our sample who participated in the AI professional learning pathway are open to AI technology. They are willing to invest their time and energy in experimenting with AI, including those teachers who prefer to maintain traditional teaching methods or integrate AI in a limited, supplementary role. However, most of them need additional practical knowledge on how to use AI tools and concrete guidance on ethical standards before they integrate it more deeply into their teaching practice.

The interplay of excitement and concern among teachers reveals a key insight: the integration of AI in education is not just a technological change, but a complex socio-technological process that encompasses ethical, pedagogical and societal dimensions. Therefore, the path to realising the potential of AI in education depends on addressing these multiple concerns within the broader educational context (Holmes et al., 2022). Indeed, teachers' attitudes towards AI technology are not formed in isolation, or only by their personal beliefs and experiences, but also by the broader educational context in which they operate. Teachers' attitudes are influenced by a complex set of different personal, societal and cultural determinants, as well as ethical considerations (Pokrivcakova, 2023). This means that contextual factors such as school policies, professional development opportunities, the educational ecosystem, and societal perceptions of the efficacy and trustworthiness of AI technologies are important in shaping teachers' perceptions and perspectives on AI. Therefore, the change connected to the adoption of AI in education requires more than just introducing a new digital tool into the classroom by enthusiastic individual teachers. Rather, as previous studies have shown, this process depends on a complex interplay of various factors, such as existing teaching practices, perceptions of school leaders, and the technical infrastructure

and pedagogical support available (Cukurova et al., 2023). Teachers will, therefore, be more enthusiastic about adopting AI technologies in an AI-supportive context.

Understanding teachers' attitudes towards AI is crucial for the future development of educational AI tools and their use in teaching and learning. Their perspectives should guide policymakers and technology developers to prioritise transparency, ethical considerations, and the creation of AI tools that support teachers' roles and are not only effective but also trusted and accepted by teachers. In light of these findings, it is evident that the journey towards integrating AI in education is iterative and collaborative, requiring ongoing dialogue between teachers, researchers, technology developers, and policymakers.

## ACKNOWLEDGEMENT

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