The Impact of AI Tools on Education: Preliminary Research of HEIs' Teachers' Perspectives

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Abstract

The integration of artificial intelligence (AI) into education has become a growing topic of interest and study, with the potential to reshape how educational practices are carried out, offering benefits like personalised learning, automated administrative tasks, and immediate feedback. However, implementing AI in education also presents challenges, such as the risk of biased algorithms and concerns about the potential reduction of teachers' roles in developing critical thinking and creativity in students. This research explores teachers' views on the use of AI in education through a survey conducted with educators from various academic backgrounds. The results indicate that while many teachers are familiar with AI and see its potential, its use in everyday teaching is still not widespread, and there are mixed feelings about its impact. Teachers value AI for its ability to assist with learning and provide support to students with special needs. However, they also worry that relying too much on technology could negatively affect students' critical thinking and motivation. The study highlights the importance of carefully integrating AI into education, ensuring that it enhances rather than replaces traditional teaching methods and that any challenges are thoughtfully addressed.

Introduction

The integration of artificial intelligence (AI) in education has been a topic of increasing interest and research over the past decade. AI technologies have the potential to revolutionise educational practices by providing personalised learning experiences, automating administrative tasks, and offering real-time feedback (Holmes et al., 2019). This literature review explores various dimensions of AI's impact on education, including its benefits, challenges, and the theoretical frameworks that underpin its application.

One of the primary benefits of AI in education is its ability to personalise learning. Personalised learning refers to tailoring educational experiences to meet individual student needs, preferences, and abilities. According to Chen, Bastedo, and Howard (2020), AI algorithms can analyse vast amounts of data to identify learning patterns and predict student performance. This capability allows educators to create customised learning paths that enhance student engagement and achievement. AI-driven personalised learning systems, such as intelligent tutoring systems (ITS), have shown promise in improving student outcomes by providing tailored instruction and feedback (VanLehn, 2011).

Another significant advantage of AI in education is the automation of administrative tasks. AI can streamline processes such as grading, scheduling, and resource allocation, freeing up educators' time to focus on teaching and interacting with students (Luckin et al., 2016). For instance, automated grading systems can quickly assess student assignments and provide instant feedback, reducing the workload on teachers and enabling them to address individual student needs more effectively (Balfour, 2013). Additionally, AI-powered chatbots and virtual assistants can handle routine inquiries from students, providing timely information and support (Keller, 2019).

Despite these benefits, the integration of AI in education also presents several challenges. One of the primary concerns is the potential for bias in AI algorithms. AI systems are trained on historical data, which may contain biases that can be perpetuated and amplified in educational settings (Noble, 2018). This issue raises ethical questions about fairness and equity in education. West, Kraut, and Chew (2019) argue that addressing these biases requires careful consideration of the data used to train AI models and the implementation of measures to ensure transparency and accountability.

Another challenge is the impact of AI on the role of teachers. While AI can augment teaching by providing additional tools and resources, there is a fear that it might undermine the teacher's role as a facilitator of learning and mentor (Selwyn, 2019). Teachers play a crucial role in developing students' critical thinking, creativity, and social skills—areas that AI currently cannot replicate (Williamson, 2016). Therefore, the successful integration of AI in education should involve a collaborative approach where AI complements rather than replaces human educators.

Theoretical frameworks such as constructivism and connectivism provide valuable insights into the application of AI in education. Constructivist theories, which emphasise active learning and knowledge construction, align well with AI's capabilities to provide interactive and adaptive learning experiences (Piaget, 1952). AI tools can create immersive learning environments where students engage in problem-solving and critical thinking activities, facilitating deeper understanding and retention of knowledge (Dillenbourg, 2013).

Connectivism, proposed by Siemens (2005), highlights the importance of networks and connections in the learning process. AI can support connectivism learning by enabling access to a vast array of resources and facilitating collaboration among learners. AI-driven platforms can connect students with peers, experts, and

educational content worldwide, promoting a more interconnected and collaborative learning environment (Anderson & Dron, 2011).

In conclusion, the literature on AI in education underscores its potential to enhance personalised learning, automate administrative tasks, and provide new opportunities for interactive and collaborative learning. However, it also highlights significant challenges, including biases in AI algorithms and the impact on the teacher's role. Addressing these challenges requires a thoughtful and ethical approach to AI integration, ensuring that it supports and enhances the educational experience without compromising fairness and equity. As AI continues to evolve, ongoing research and dialogue will be crucial to harnessing its benefits while mitigating its risks.

The goal of the paper is to investigate teachers' attitudes towards the use of AI in education, focusing on their familiarity with AI tools, perceived benefits and challenges, and the extent of AI integration in their teaching practices. The methodology involved conducting a survey among teachers from various academic levels, gathering both demographic data and insights into their experiences with AI. The results indicate that while there is a general familiarity and positive outlook on AI's potential, its integration into everyday teaching is still moderate, with significant variation in comfort levels and a need for further support and training.

The introduction outlines the goals of the paper, which focus on investigating teachers' attitudes towards the use of AI in education. This is followed by the methodology chapter, which details the survey conducted among educators to gather data on their familiarity with AI tools, perceived benefits, and challenges. The results chapter presents the findings, showing that while there is general optimism about AI's potential, its integration into everyday teaching is still limited, with varying levels of comfort among teachers. Practical implications are generated based on the research results. The concluding chapter emphasizes the importance of addressing these challenges through ongoing support and training to ensure that AI effectively complements traditional teaching methods.

Methodology

A survey questionnaire was administered among teachers from various academic years. The questionnaire included questions on demographic data, the level of familiarity and use of AI tools, perceptions of their benefits and risks, and other technologies considered important for education. The survey was anonymous, ensuring that respondents could freely express their opinions without fear of repercussions. Most respondents were aged 31-40 years, indicating experienced teachers who have witnessed various phases of technological changes in education (Table 1). Teachers taught at different academic years, from the first year of undergraduate to graduate studies, providing insights into a broad spectrum of educational levels.

Table 1
Demographic characteristics of participants in the survey

| Age	#	%
20 - 30	3	9,4%
31 - 40	12	37,5%
41 - 50	6	18,8%
51 - 60	11	34,3%
61+	0	0%
Total	32	100%

Source: Authors' work; Survey conducted June 2024

The data were analysed using quantitative methods to obtain representative results. Descriptive statistics were used to summarise the data, and inferential statistics were employed to explore relationships between variables. This methodological approach ensures a comprehensive understanding of the current state of AI integration in education and highlights areas needing further investigation and support.

Results

Figure 1 presents the responses of respondents regarding their familiarity with AI tools. The chart reveals that teachers are generally familiar with AI tools like ChatGPT, with most respondents expressing a high degree of familiarity and optimism about AI's potential to accelerate learning. However, the frequency of AI tool usage remains moderate, indicating that these technologies are not yet fully integrated into everyday teaching practices. There is a strong consensus that significant changes in educational practices are necessary to accommodate AI, with many teachers recognising the need for systemic adjustments. While there is overall enthusiasm about the positive impact of AI on the future of education, comfort levels with integrating these tools vary, suggesting that further support and training are needed to help all teachers feel confident in using AI effectively.
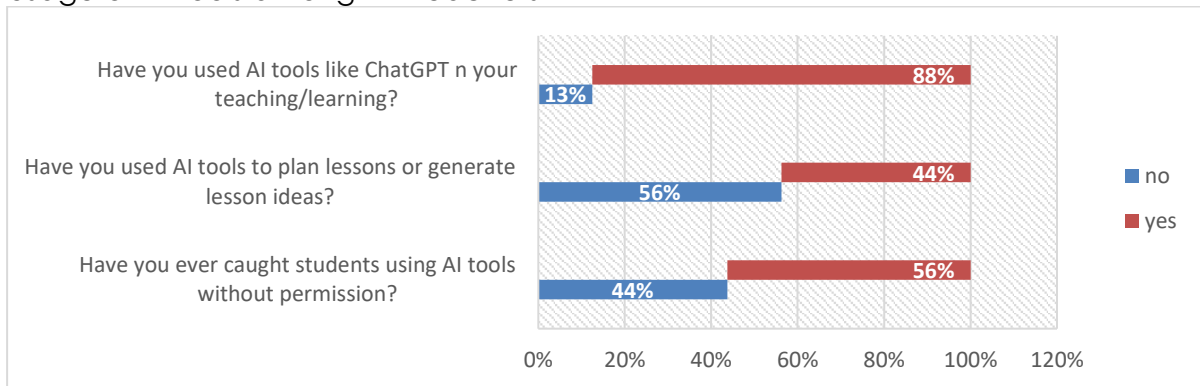
Figure 1
Familiarity of teachers with AI tools
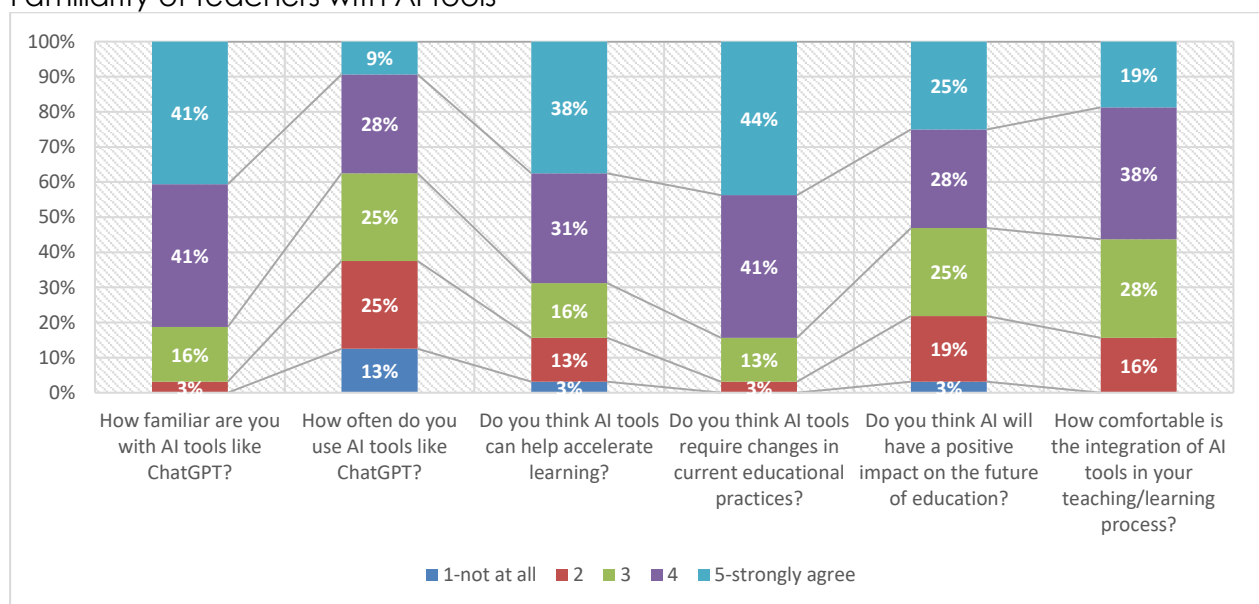
Source: Authors' work; Survey conducted June 2024

Figure 2 presents the usage of AI tools among HEI teachers. A significant 80% of respondents use AI tools in their teaching, indicating a high level of acceptance of these new technologies. This widespread use highlights the growing trend of integrating AI into educational practices and underscores the importance of providing continuous professional development to keep pace with technological advancements. More than half of the respondents caught students who were using AI without permission. However, not many respondents use AI to plan lessons or generate lesson ideas. Despite the growing presence of AI in education, many teachers still do not heavily rely on it.
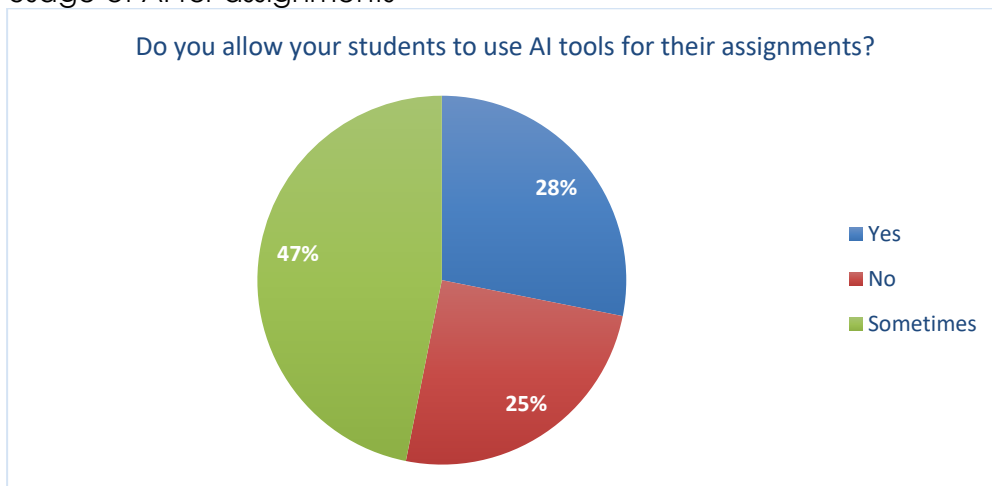
Figure 2
Usage of AI tools among HEI teachers

Source: Authors' work; Survey conducted June 2024

Figure 3 indicates a diverse range of teacher attitudes towards allowing students to use AI tools for their assignments. Out of the respondents, only 28% allow their students to use AI tools, while 25% do not permit it. The largest group, with 47% respondents, allows students to use AI tools only sometimes.
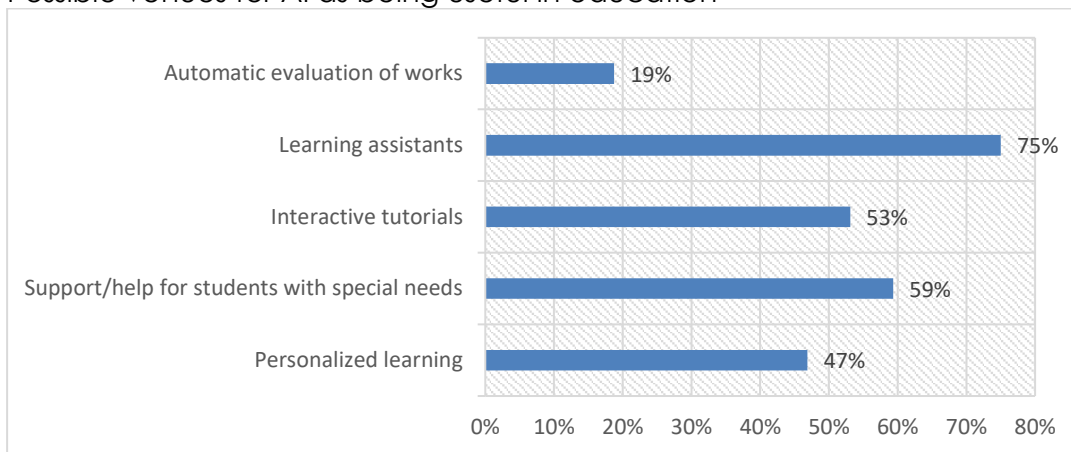
Figure 3
Usage of AI for assignments

Source: Authors' work; Survey conducted June 2024

Teachers often encourage students to use AI tools for a variety of educational purposes, recognising the benefits these technologies bring to the learning process (Figure 4). The data indicates that educators see significant potential for AI tools in various aspects of education, with 75% of respondents identifying AI as particularly useful in serving as learning assistants. Additionally, 59% believe AI can provide crucial support for students with special needs, and 53% see value in AI-powered interactive tutorials. Personalized learning is also recognized by 47% of respondents as an area where AI can be beneficial. However, there is less confidence in the use of AI for automatic evaluation of works, with only 19% of educators viewing it as a useful application.
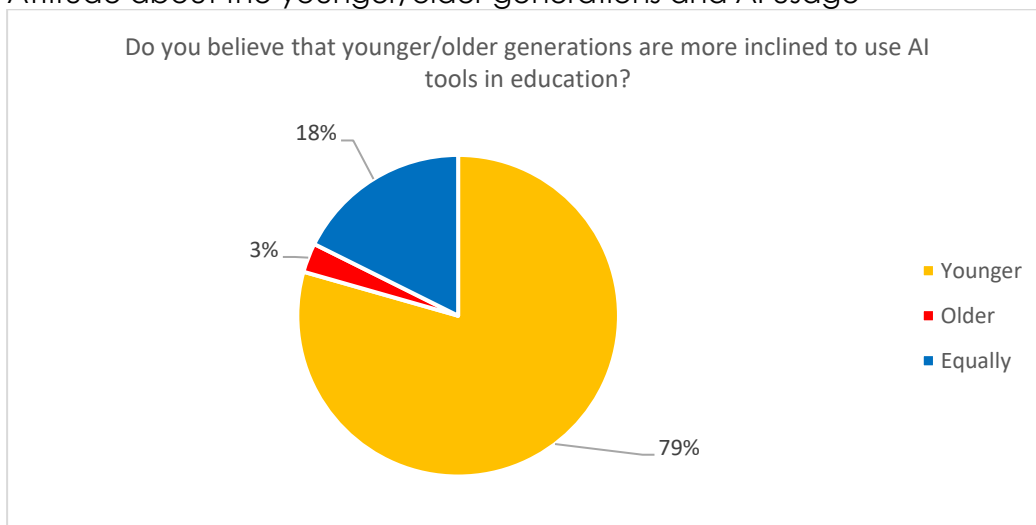
Figure 4
Possible venues for AI as being useful in education

Source: Authors' work; Survey conducted June 2024

Figure 5 presents the attitudes of respondents that younger generations are more inclined to use AI tools in education, as evidenced by the 79% of respondents who selected this option. Only one respondent (3%) believes that older generations are more inclined to use AI, while 18% of respondents think that both generations are equally inclined.
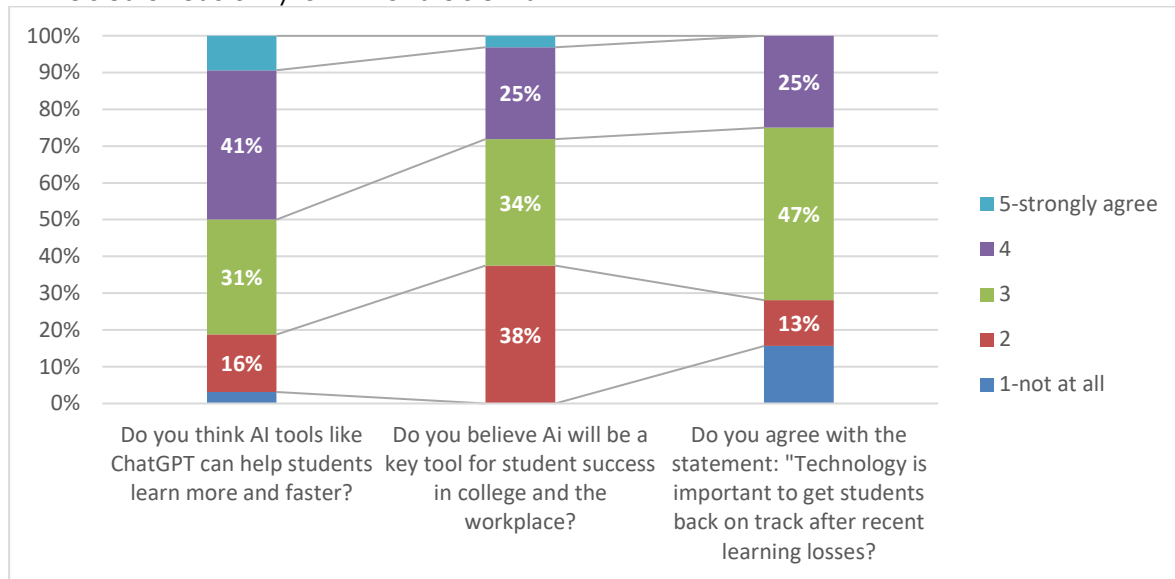
Figure 5
Attitude about the younger/older generations and AI usage

Source: Authors' work; Survey conducted June 2024

While many teachers are open to integrating AI into education, there is uncertainty about whether AI will help students learn faster and more effectively (Figure 6). The data reveals that educators generally have a positive outlook on the role of AI tools like ChatGPT and technology in education. Specifically, 41% of respondents strongly believe that AI can help students learn more quickly and effectively, while 31% others also see it as beneficial, though to a slightly lesser extent. When considering AI's role in future success, 38% educators believe it will be key for student achievement in college and the workplace, with 34% agreeing, albeit with some reservations. Additionally, 47% respondents strongly agree that technology is crucial in helping students recover from recent learning losses, highlighting the significant importance placed on technological tools in addressing educational challenges and supporting student achievement.
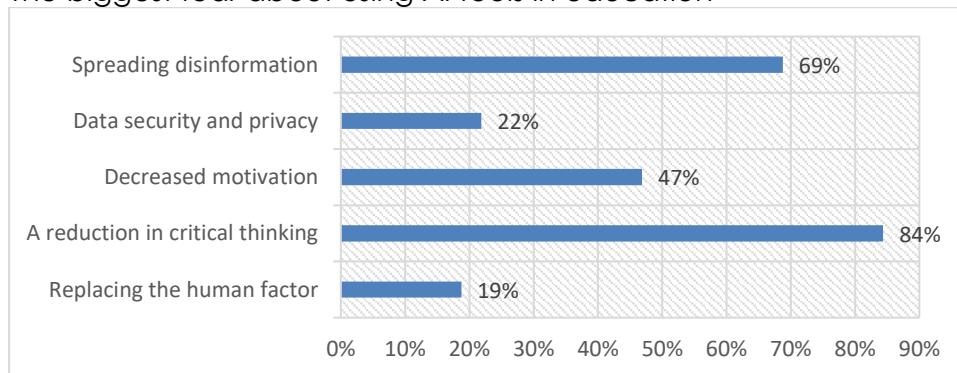
Figure 6
Attitudes of usability of AI for students

Source: Authors' work; Survey conducted June 2024

The most common concerns among teachers include reduced critical thinking and decreased student motivation (Figure 7). These fears highlight the need for careful implementation of AI tools to ensure their positive effects and minimise negative impacts. Teachers are worried that over-reliance on AI might lead to a decline in students' analytical skills and intrinsic motivation for learning. To address these concerns, it is crucial to integrate AI in a way that complements and enhances traditional teaching methods rather than replacing them. This might involve using AI to handle routine tasks, allowing teachers to focus more on fostering critical thinking and creativity in their students.
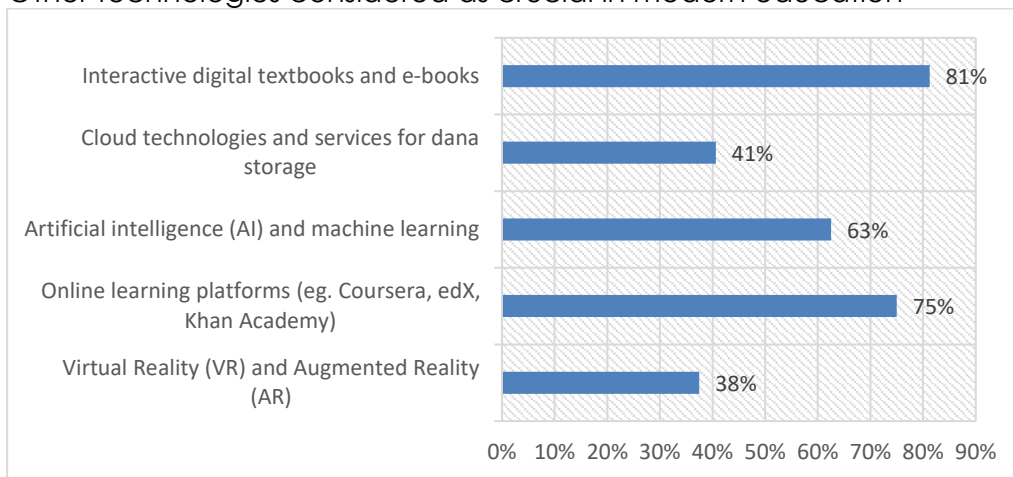
Figure 7
The biggest fear about using AI tools in education

Source: Authors' work; Survey conducted June 2024

Teachers highlighted e-books, artificial intelligence, online learning platforms, virtual reality, and cloud technologies as key technologies in modern education (Figure 8).

Figure 8
Other technologies considered as crucial in modern education

Interactive digital textbooks and e-books — 81%
Cloud technologies and services for dana storage — 41%
Artificial intelligence (AI) and machine learning — 63%
Online learning platforms (eg. Coursera, edX, Khan Academy) — 75%
Virtual Reality (VR) and Augmented Reality (AR) — 38%

Source: Authors' work; Survey conducted June 2024

These technologies are seen as complementary tools that, together with AI, can transform the educational landscape. For example, online platforms can provide flexible and accessible learning opportunities, virtual reality can offer immersive learning experiences, and cloud technologies can facilitate collaboration and access to resources.

Practical implications

The study investigates teachers' attitudes toward AI in education, revealing optimism about its potential but highlighting the need for greater integration and support. The findings emphasize the importance of targeted training and ethical considerations to ensure AI effectively complements traditional teaching methods.

Figure 9
Overview of practical implications on how to foster AI usage among HEIs teachers
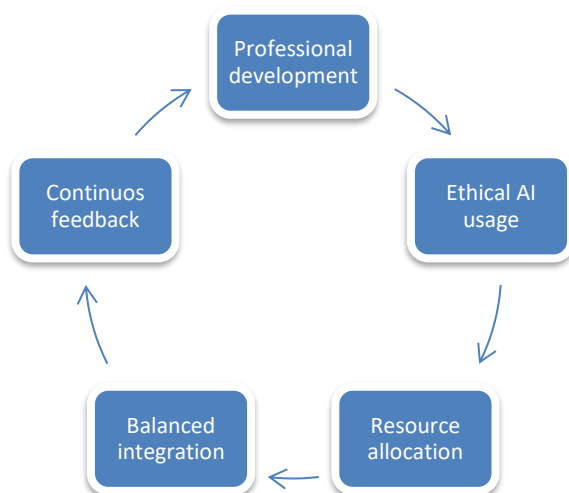
Source: Authors' work

The practical implications of this work are significant for educational institutions, policymakers, and educators (Figure 9):
- Professional Development. Implement targeted training programs for teachers to increase their familiarity and comfort with using AI tools, ensuring they can effectively integrate these technologies into their teaching practices.

- Ethical AI Usage. Develop guidelines and protocols to address ethical concerns, such as bias in AI algorithms, to ensure fair and equitable use of AI in educational settings.
- Resource Allocation. Allocate resources to support the implementation of AI tools, including access to necessary technology, software, and ongoing technical support for educators.
- Balanced Integration. Encourage a balanced approach to AI adoption, where AI tools are used to complement traditional teaching methods rather than replace them, maintaining the crucial role of teachers in the learning process.
- Continuous Feedback. Establish mechanisms for continuous feedback from educators to refine AI tools and their applications in the classroom, ensuring they meet the practical needs and concerns of teachers and students.

Conclusion

The results show that teachers are generally aware of and open to using AI tools in education, but significant concerns remain. Given that AI tools are relatively new in education, it is understandable that teachers express concerns about their potential negative impacts. It is necessary to work on educating and supporting teachers to minimise risks and maximise the benefits of AI technologies. This includes providing training on how to effectively integrate AI into their teaching practices, ensuring access to necessary resources, and fostering a collaborative environment where teachers can share experiences and best practices.

Additionally, transparency and teacher involvement in the process of implementing AI tools are crucial to ensure their effectiveness and acceptance. Teachers should be involved in the decision-making process regarding the adoption of AI tools, and their feedback should be considered to address practical challenges and concerns. Furthermore, ongoing research is needed to evaluate the long-term impact of AI on education and to develop guidelines for its effective use.

AI tools like ChatGPT have the potential to improve the educational process significantly, but it is crucial to address the concerns and challenges that teachers feel. Further research and support in the implementation of these technologies will be essential for their success in education. It is necessary to develop strategies for the effective integration of AI tools, considering teachers' feedback and continuously monitoring their impact on the educational process. By doing so, we can ensure that AI enhances rather than detracts from the quality of education, fostering an environment where both teachers and students can thrive.

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