



Turun yliopisto
University of Turku

The benefits and challenges of using AI at schools for teachers

Alexandra Vokhmina, Linus Ma
Bachelor's Thesis 8 credits

Educational Science
Department of Teacher Education
University of Turku, Rauma
May 2025

In accordance with the quality system of the University of Turku, the originality of this publication has been checked with Turnitin Originality Check system.

UNIVERSITY OF TURKU
Department of Teacher Education, Rauma

ALEXANDRA VOKHMINA & LINUS MA: The benefits and challenges of using
AI at schools for teachers

Bachelor's Thesis, May 2025

Summary

This study explores the benefits and challenges regarding the integration of artificial intelligence (AI) in teaching, focusing on how AI can support education while also addressing concerns posed by AI. Findings from the literature review reveal that AI contribute positively to student engagement and learning outcomes due to individualized educational experiences. However, major concerns arise including lack of training for teachers in effectively using AI, ethical problems, and possible bias in AI content. Many educators are not ready to integrate AI effectively due to existing misconceptions on AI and limited school support. Despite the growing presence of AI in modern education, the importance of real human emotional connections in classroom teaching should not be understated. This study suggests that AI tools should be implemented in teaching with careful consideration with regards to teacher training. Moreover, it is essential to create training courses among teachers, establish ethical guidelines and offer support to strengthen their AI literacy. The research contributes to a better understanding of effective and responsible AI integration into education and encourages thoughtful adoption among current and future teachers.

Keywords: AI, Education, In-service teachers, Pre-service teachers, Benefits, Challenges

CONTENT

1	INTRODUCTION	4
2	DEFINITIONS	5
3	AI-ASSISTED LEARNING TOOLS	6
4	AI USE IN EDUCATION	7
4.1	Reducing teacher workload	7
4.2	Enhancing teaching with AI.....	8
4.3	AI tools supporting teacher reflection	9
4.4	Irreplaceable teacher.....	9
4.5	Bias in AI.....	10
4.6	Academic integrity and constraints.....	11
5	DISCUSSION	13
6	CONCLUSION	15
	REFERENCES	16

The growth of artificial intelligence (AI) is rapidly becoming widespread in many aspects of life. The exponential growth of AI in the education sector necessitates further research. Yet, the research on specific viewpoints on the use of AI is understudied. As online generative AIs (GAI), such as ChatGPT and Copilot, are becoming readily accessible on the Internet, use of AI has become more prominent in many sectors. These tools can generate tailored texts and images for students. Although the use of AI is widely discussed, and new research is constantly being done, there is limited research done about how AI tools affect teacher's work in the classroom.

Although AI advances, the impacts in the education context are under-researched. In-service and pre-service teachers face uncertainty in implementing AI into their own teaching. Current research on AI focuses on educators as a whole and contains limited specified methods of implementation of AI (Okaiyeto et al., 2023) at different levels of schools. Teachers may feel hesitant to employ AI in their own methods due to several factors: familiarity with using AI by itself, lack of known methods to use AI effectively in lesson planning, and lack of concrete impacts of such methods (Erol & Erol, 2024). Without research that informs or supports the effectiveness of AI, in-service and pre-service teachers cannot make informed decisions on how and why to use AI in their own teaching.

In this literature review paper, we will explore the impacts of the use of AI in classrooms, often with what in-service and pre-service teachers think about future implications of AI integration into education. Currently, there is little information on how teachers view integrating AI into their own classroom and their preparedness for doing so. Therefore, we aim to investigate how AI tools may affect teachers (and students) focusing on the benefits and challenges posed.

Our research question is:

1. What are the benefits and challenges of using AI at schools for teachers?

Artificial Intelligence (AI)

Russell and Norvig (2021) explains that artificial intelligence (AI) is the ability of computer systems to carry out functions that are commonly linked to human intelligence, including learning, reasoning, solving problems, perceiving environments, and making decisions.

Generative Artificial Intelligence (GAI)

Refers to a type of AI, such as ChatGPT and CoPilot, which can generate media, such as texts, images, music, and others. It mimics human-like reasoning and problem-solving abilities. GAI algorithms are able to create new unique content made on given information.

In-Service Teacher and Pre-Service Teacher

Koellner and Greenblatt (2018) define a pre-service teacher as someone who is in the process of preparing to become a teacher, in contrast to an in-service teacher who is already certified or teaching in a classroom.

Artificial intelligence (AI) is a tool not yet utilized fully in education. It serves to provide answers for improving current classrooms, such as personalized learning (UNESCO, 2025). AI can create opportunities for teachers to enhance their teaching by offering adaptive learning platforms. Through adaptive platforms, teachers are enabled by AI to create teaching that cater to individual needs or different classroom environments.

In addition to adaptive learning platforms, a variety of AI-assisted learning tools are making their way into the educational setting. Some of these tools to include are the following:

Intelligent Tutoring System (ITS)

These AI tools try to simulate the role of a personal tutor, providing personalized feedback to students while supporting their learning. ITS helps students learn topics at their own pace.

Automated Grading and Assessment Tools

These are AI-powered grading tools allow for automating student assessments. From simple multiple-choice to open ended essays, these tools can even provide contextualized assessment by analyzing grammar, language and structure.

AI-Powered Learning Analytics

These AI learning analytics analyze students' data, identify student performance trends and predict learning outcomes. Teachers can use AI algorithms to analyze data and use GAI to interpret and provide text feedback to students, enabling teachers to provide more personalized learning.

The literature provides a comprehensive view on AI in its current state, advantages and issues of its use.

4.1 Reducing teacher workload

AI, in the educational context, pose positive impacts. AI, such as generative AI (GAI), can provide personalized learning for an individual when given enough information (Chiu et al., 2023). A student's performance can be analyzed by AI and be used to create personalized exercises or point out common mistakes. The prompts generated are instantaneous compared to actual analysis (Jauhiainen & Guerra, 2023). This can serve as a quick tool for teachers to get information and understand students' misconceptions, producing more personalized exercises that tackle these issues.

Jauhiainen and Guerra (2023) shows that AI could enhance engagement in lessons for students of different ages and abilities. Learning materials of diverse topics used for students can be effectively generated by generative AI (Jauhiainen & Guerra, 2023). Erol and Erol (2024) supports this, saying that generative AI can also assist teachers by personalizing learning, automating tasks, such as grading and producing creating tasks, improving lesson planning and Teacher-AI Collaboration models in a primary school setting.

Perks (2020) adds to this point with an AI system developed at the University of Birmingham that can provide assignment that teachers can review with students, highlighting the adaptiveness of AI in the classroom. The AI system can also accept both handwritten and digital homework, being able to provide feedback based on a teacher-defined correct method.

Also, the learning process with the help of generative AI can make learning more enjoyable by adjusting it to each student's needs, and using AI tools with teacher guidance can enhance student engagement and improve learning outcomes (Chiu et al., 2023). Effectively integrating AI into the classroom can bring benefits to teachers, such as catering to learners, reducing teacher workload, and improving student motivation.

Although teachers can do the same tasks as AI, it is highly time-consuming and exhausting for them (Nazaretsky et al., 2022). Outside the classroom, teachers may not have the time to attend to each students' needs adequately. Effectively integrating AI to the classroom can assist teachers with menial tasks while allowing teachers to allocate their time to more important tasks, such as planning classroom activities and giving students more personalized feedback.

4.2 Enhancing teaching with AI

According to Kim (2024), working with AI systems that analyze students' learning improved teachers' understanding of both students' learning difficulties and other patterns that might not be noticed without it. AI can quickly reveal patterns and insights to student learning that is time-consuming for teachers to analyze and find. Teachers can use the information provided by AI to plan for better and more suitable learning activities to suit the classroom needs.

However, Ottenbreit-Leftwich et al. (2023) explain teachers struggled with their own misconceptions about AI and a concern about their own lack of understanding. Despite AI's potential to enhance classroom instruction, implementation is hindered by lack of teacher training and unfamiliarity. Moreover, Niu et al. (2022) express AI aided platforms required improvements in user-interface to make it more user-friendly. Combined with teachers who have misconceptions about AI, unintuitive user-interface can cause additional hurdles for teachers overcome in order to integrate AI tools effectively.

AI allows for more hands-on activities in the classroom, such as simulating a set of realistic or authentic situations in the areas of instructions for students to solve (Kim, 2024). Since AI can analyze and generate content instantaneously, teachers do not need to come up with unique scenarios themselves. Instead, teachers can pick suitable scenarios and change the content when necessary. This advantage aligns with teachers' desires to create a more engaging classroom environment but without creating much more workload. However, AI can solve well-defined problems but struggles to understand complex and open issues in diverse teaching environments (Kim, 2024). Combined with teachers who lack of understanding of how AI works, this could lead to poor delegation choices when integrating AI into the classroom.

4.3 AI tools supporting teacher reflection

Collaborating with AI tools is found to be less time-consuming, more flexible and can be done by self without the need for an observation teacher (Kim, 2024). However, good quality data from AI is essential. Furthermore, the data must be carefully analysed contextually.

The need for quality data collected from AI is explained by inherent biases in AI. According to Baines et al. (2024), AI that are trained on large datasets are rarely bias free. Teachers may be concerned that AI biases can lead to unequal treatment or misinterpretation of student needs, thereby lowering the accuracy of data provided.

More support is needed for teachers to continuously and reliably collect, analyse and interpret the data given (Kim, 2024). This data indicates that there are two main concerns about using AI for reflection: receiving quality data and support from school to collect and interpret the data. Schools need to develop and aid teachers that integrate AI into the classroom.

4.4 Irreplaceable teacher

Chiu et al. (2023) find that teachers' involvement can significantly impact how effectively students engage with AI tools. This indicates that AI can bring support to the classroom setting but depends on how the teacher utilizes AI as an engagement tool. Also, Erol and Erol (2024) emphasize that AI can support education but cannot replace human teachers. Chiu et al. (2023) further support this statement by saying teacher support is preferred by novice students instead of AI. Some students preferring real teachers indicates that while AI brings many benefits to both teachers and students, AI cannot fully replace a teacher's presence in the classroom. Therefore, it must be integrated in conjunction with human teachers to avoid negative effects on students' development. This supports Ottenbreit-Leftwich et al. (2023) suggestion that AI literacy should be incorporated into primary education. Furthermore, teacher support and properly developing curriculum for AI literacy are necessary for effective implementation.

Erol and Erol (2024) explore how AI can help in the classroom. AI can be used to make teaching more effective, and integrating AI into education is inevitable. They believe that AI makes teaching easier, allows monitoring of students' progress, reduces their workload, enriches students' learning, and adds speed and practicality to the teacher.

According to Erol and Erol (2024), AI cannot replace teachers due to lack of emotional connection with the student in primary school. Three out of four teacher responses on the replaceability of teachers mention that AI cannot emulate emotions or connect with students due to lack of true emotions. Teacher-student connections are not only shaped by interactions within the classroom but also outside. This teacher-student is in line with the findings of Chiu et al. (2023), that not all students prefer AI teaching. In education, the importance of connecting with the students is more important than simply focusing on the benefits of integrating AI into education. Furthermore, AI that teachers use for teaching is not designed specifically for the educational context (Kim, 2024). This further supports that AI in its current stage, is not ready to fully replace teachers in the education context.

4.5 Bias in AI

AI also presents various ethical concerns such as plagiarism, bias, overreliance, and misinformation (Baines et al., 2024). GAI gives information directly according to user prompt. Since GAI is trained on publicly available and licensed datasets, teachers may unknowingly plagiarize them, infringing on intellectual property rights (Okaiyeto et al., 2023). Harmful stereotypes can be reinforced by AI-generated materials, leading to students receiving biased content.

This concern is supported by Baines et al. (2024), highlighting the inherent biases in AI itself in image generation. Using Stable Diffusion, they revealed that images generated are often reinforcing negative stereotypes. This means harmful information could be directed to students. As use of AI becomes more routine, teachers may increasingly rely on AI to generate materials. The overreliance may lead to lack of creativity, discouragement of creating original materials or overreliance on GAI (Jauhiainen & Guerra, 2023). Combined with the possible misinformation and inaccuracies in the

content that GAI generates (Chiu et al., 2023), students may receive inaccurate or incorrect information teachers failed to vet.

Furthermore, the AI demonstrated the ability to ignore safety prompts, generating explicit photos (Baines et al., 2024). When put into the classroom setting, this compromises the integrity of the education and undermines the trust teachers put in AI as an educational tool, potentially introducing unintended biases in children. Since AI is still a new technology and its' unpredictability, widespread integration in classrooms could be irresponsible without strict monitoring.

4.6 Academic integrity and constraints

Integrating AI into education raises concern on academic integrity. Okaiyeto et al. (2023) highlight the seriousness of AI-assisted cheating, such as plagiarising, completing assignments, and essay farming, which leads to generative AI being banned on campus in some U.S. schools. This drastic measure to banning AI on campus indicates that it can be misused, and clear planning is required to prevent oversight. Teachers and schools must implement AI with strict guidelines to uphold academic integrity.

Despite teachers trusting the benefits of AI systems that work hand-in-hand with analyzing students' learning, efforts to personalize instructions are hindered by standardized testing imposed by schools and government (Kim, 2024). This implies that using AI to personalize student learning can create a more enjoyable learning experience, but education systems that focus on using standardized testing will limit the benefits of implementing AI.

In the case of pre-service teachers, their willingness to integrate AI into their own teaching is directly influenced by factors such as perceived usefulness, perceived ease of use, self-efficacy and technological pedagogical content knowledge (Sun et al., 2024). Trying to integrate AI proficiently as part of their teaching is often challenging due to insufficient training and professional development. Despite the integration of AI being inevitable (Sun et al., 2024), both in-service and pre-service teacher training did not prepare them teachers to integrate AI into their teaching. The lack of proper teacher training for AI integration

for pre-service teachers and professional support for in-service teachers leads to lowered effectiveness and efficacy of integrating AI in teaching.

In this paper, we explored the benefits and challenges of using AI at schools for teachers on the use of AI in teaching. Lesson planning, student assessment, and other schoolwork can be improved by AI tools. They allow teachers to delegate some workload to AI programs, which enables teachers to have more time on careful lesson and activity planning. AI can generate activities, lesson plans, and materials that can be adapted by the teachers. Teachers can choose and adjust suggested ideas, using their own creativity. Moreover, AI tools can adapt to each student's needs and provide material which is individualized and thus empower students' motivation to learn and improve learning outcomes.

Even though there are many positive sides of using AI, concerns have been posed about integration of AI tools into education system. According to the findings, content generated by AI is not always dependable and accurate. It can give suggestions on designing study materials, but not necessarily provide pedagogically appropriate results. Moreover, AI is trained by large amounts of data which brings concerns about security and data privacy. Additionally, there is worry about teachers becoming overly reliant on AI help, since it can lead to decrease in their professionalism.

Another issue is the lack of teacher training for AI integration. Since AI is a new tool to use in teaching and planning, many educators are unprepared regarding proper and effective use of AI. With lack of knowledge on utilizing AI, teacher's ability to effectively implement AI tools is limited, reducing the benefits brought by AI. It is a need for modern teacher education to implement studies on proper use and integration of AI, as well as concerns, so that teachers can use AI tools as instruments to support and develop their teaching. Moreover, schools should be encouraged in providing AI training and ethical guidelines to motivate educators in using AI tools. Lack of preparation in utilizing AI may lead to indifference and lack of interest in using AI by educators.

Yet, further research is needed to explore possibilities of AI integration into school settings for empowering teachers' abilities and their work instead of reducing their influence. It is vital to investigate various in-service and pre-service teachers' views across different contexts, such as across different cultural environments and between

public and private schools. Besides, to use AI effectively, ethically, and properly, teachers need to familiarize themselves with the skills through professionally designed development applications, which is another important research to explore.

Even though AI provides many opportunities for improving education, the literature suggests to not consider AI as a substitute for teachers but rather as a complementary tool that supports teachers' work. Despite the usefulness of AI, it cannot replicate human judgment, creativity, and emotions, which are important aspects of teaching. Therefore, utilizing AI tools must support, rather than replace, teacher's core role of supporting students in developing essential skills, such as critical thinking, social-emotional stability, and well-being.

In conclusion, AI potentially can alter education, but it is only possible if its benefits and challenges are understood and teachers are prepared to use it in their own teaching with school support. A thoughtful approach to AI integration is essential to ensure that it becomes a beneficial tool in education.

REFERENCES

- Baines, A., Gruia, L., Collyer-Hoar, G., & Rubegni, E. (2024). Playgrounds and prejudices: Exploring biases in generative AI for children. *Proceedings of the 23rd Annual ACM Interaction Design and Children Conference*, 839–843. <https://doi.org/10.1145/3628516.3659404>
- Chiu, T. K. F., Moorhouse, B. L., Chai, C. S., & Ismailov, M. (2023). Teacher support and student motivation to learn with artificial intelligence (AI)-based chatbots. *Interactive Learning Environments*, 32(7), 3240–3256. <https://doi.org/10.1080/10494820.2023.2172044>
- Erol, M., & Erol, A. (2024). Use of artificial intelligence (AI) technologies in education according to primary school teachers: Opportunities and challenges. *Sakarya University Journal of Education*, 14(3), 427–446. <https://doi.org/10.19126/suje.1446227>
- Jauhiainen, J. S., & Guerra, A. G. (2023). Generative AI and ChatGPT in school children’s education: Evidence from a school lesson. *Sustainability*, 15(18), Article 14025. <https://doi.org/10.3390/su151814025>
- Kim, J. (2024). Types of teacher-AI collaboration in K-12 classroom instruction: Chinese teachers’ perspective. *Education and Information Technologies*, 29(13), 17433–17465. <https://doi.org/10.1007/s10639-024-12523-3>
- Koellner, K., & Greenblatt, D. (2018). Inservice teacher education. *Oxford Bibliographies*. <https://doi.org/10.1093/obo/9780199756810-0196>
- Niu, S. J., Luo, J., Niemi, H., Li, X., & Lu, Y. (2022). Teachers’ and students’ views of using an ai-aided educational platform for supporting teaching and learning at Chinese schools. *Education Sciences*, 12(12), 858. <https://doi.org/10.3390/educsci12120858>
- Okaiyeto, S. A., Bai, J., & Xiao, H. (2023). Generative AI in education: To embrace it or not. *International Journal of Agricultural and Biological Engineering*, 16(3), 285–286. <https://doi.org/10.25165/j.ijabe.20231603.8486>

- Ottenbreit-Leftwich, A., Glazewski, K., Jeon, M., Jantaraweragul, K., Hmelo-Silver, C. E., Scribner, A., Lee, S., Mott, B., & Lester, J. (2023). Lessons learned for AI education with elementary students and teachers. *International Journal of Artificial Intelligence in Education*, 33(2), 267–289. <https://doi.org/10.1007/s40593-022-00304-3>
- Perks, S. (2020). AI could reduce teacher workload. *Physics World*, 33(8), 11. <https://doi.org/10.1088/2058-7058/33/8/15>
- Russell, S. J., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed., pp. 79). Pearson.
- Sun, F., Tian, P., Sun, D., Fan, Y., & Yang, Y. (2024). Pre-service teachers' inclination to integrate AI into STEM education: Analysis of influencing factors. *British Journal of Educational Technology*, 55(6), 2574–2596. <https://doi.org/10.1111/bjet.13469>
- UNESCO (2025). Artificial intelligence and education: Guidance for policy-makers.
- Yim, I. H. Y., & Wegerif, R. (2024). Teachers' perceptions, attitudes, and acceptance of artificial intelligence educational learning tools: An exploratory study on artificial intelligence literacy for young students. *Future in Educational Research*, 2(4), 318–345. <https://doi.org/10.1002/fer3.65>