University Teachers' Perspectives on Using Artificial Intelligence in Teaching and its Related Aspects

Sirkku Lähdesmäki
University of Eastern Finland, Finland

Sanna Väisänen
University of Eastern Finland, Finland

Heidi Hyytinen
University of Eastern Finland, Finland

www.ijonses.net

To cite this article:

Lähdesmäki, S., Väisänen, S., & Hyytinen, H. (2025). University teachers' perspectives on using Artificial Intelligence in teaching and its related aspects. *International Journal on Social and Education Sciences (IJonSES),* *7*(3), 272-291. https://doi.org/10.46328/ijonses.5036

International Journal on Social and Education Sciences
2025, Vol. 7, No. 3, 272-291 https://doi.org/10.46328/ijonses.5036

University Teachers' Perspectives on Using Artificial Intelligence in Teaching and its Related Aspects

Sirkku Lähdesmäki, Sanna Väisänen, Heidi Hyytinen

Article Info

Article History

Received:
28 February 2025
Accepted:
24 May 2025

Keywords

AI in teaching
Self-efficacy
Intrinsic motivation
AI ethics
Higher education

Abstract

This study explores interconnections between university teachers' self-efficacy beliefs, intrinsic motivation, behavioural commitment, and teachers' views on the ethics of AI and the possibilities of using AI in teaching. Furthermore, the aim is to investigate how teachers' teaching experience and their participation in AI training relate to these aspects. The data consist of teachers' (n=92) survey responses and open-ended answers. Data analyses included both quantitative and qualitative methods. The quantitative data were analysed with correlations, t-test, and ANOVA, while content analysis was used to analyse the qualitative data. The results indicated that teachers emphasized the importance of ethical perspectives on AI. A positive connection was found between university teachers' self-efficacy for using AI in teaching, intrinsic motivation, and behavioural commitment. Teachers with AI training reported higher self-efficacy for using AI in teaching, and they had significantly higher levels of intrinsic motivation and behavioural commitment than teachers without AI training. Moreover, they highlighted more possibilities for using AI in planning their teaching and supporting student learning than teachers without AI training. This study enhances understanding of how university teachers' self-efficacy, intrinsic motivation, and behavioural commitment to using AI in teaching are interrelated, highlighting the potential moderating role of AI training participation.

Introduction

Although the rapid development of artificial intelligence (henceforth AI) challenges the way we teach, research on this topic is still scarce. Previous research states that teachers' beliefs about technology have a significant impact on their use of digital technologies (Bice & Tang, 2022; Ertmer & Ottenbreit-Leftwich, 2010). This also applies to AI (Mah & Groß, 2024). AI has increasingly been adopted in educational practices (Crompton & Burke, 2023; Hasanein & Sobaih, 2023; Rasul et al., 2023), highlighting the need to address the benefits, risks, and ethical challenges. Yet, university teachers' views on these matters have not been extensively studied (Oran, 2023).

Recent research has shown that generative AI can be seen as a useful tool in education, and it may enhance teachers' professional development (Kaplan-Rakowski et al., 2023). It can also free teachers up from routine tasks to more essential teaching-related activities (Ghimire et al., 2024). However, using AI in teaching is not without

challenges. The potential challenges, such as technical complexity and inadequate training, may slow down AI's broader implementation (Mehdaoui, 2024). This lack of university teachers' technological knowledge was also noted in a systematic review related to AI in higher education by Bond et al. (2024). The lack of technological and pedagogical knowledge together with ethical concerns may also challenge teachers' self-efficacy for using AI in teaching (cf. Mah & Groß, 2024; Oran, 2023). Furthermore, self-efficacy plays a mediating role in human behaviour, as it is related to the chosen pedagogical practices and commitment (Cao et al., 2018; Postareff et al., 2023; Zee & Koomen, 2016). Research has shown that teachers with strong self-efficacy beliefs implement new pedagogical methods in their teaching more likely than their peers with low self-efficacy beliefs (Zee & Koomen, 2016). Furthermore, teachers' self-efficacy beliefs have been found to be linked to teacher training and teaching experiences (Bruna et al., 2023; Gale et al., 2021). Teachers' actions are also influenced by intrinsic motivation, which may impact one's behavioural commitment (Kell & Motowidlo, 2012; Uysal, 2023).

This mixed methods study explores how university teachers' self-efficacy beliefs, intrinsic motivation, and behavioural commitment to using AI in teaching are related to each other and to teachers' views on AI ethics. Additionally, the aim is to investigate how teaching experience and participation in AI training relate to these aspects. As the use of AI is becoming increasingly prevalent in everyday university teaching, our goal is to also explore teachers' views on the possibilities of using AI in teaching.

AI in Teaching

There is no definitive consensus on the definition of AI, but there is general agreement that it involves simulating or modelling human-like intelligence and cognition in machines (Popenici & Kerr, 2017; Wartman & Combs, 2018). According to the regulations of the European Commission (2024), the use of AI and the AI systems deployed within the EU must promote human-centered AI. Additionally, education should ensure the use of safe, reliable, and ethical AI in teaching, learning, and research (European Commission, 2024). The use of AI in teaching and learning often involves generative models, such as the Generative Pre-trained Transformer (GPT), which aims to replicate human language processing capabilities (Cascella et al., 2023). A similar definition is echoed in the Finnish Universities guidance of the use on AI in teaching, learning and research (see University of Eastern Finland, 2024). The use of AI is generally permitted in Finnish universities as part of teaching, learning, and even research (see e.g., University of Eastern Finland, 2024; University of Helsinki, 2024).

The digitalization of societal phenomena has a significant impact on pedagogy, literacy skills, and societal aspects (Maunula & Lähdesmäki, 2022), which is increasingly evident through the rapid development of AI. Regarding the integration of AI in teaching in higher education, there is considerable potential for the transformation of conventional pedagogical methodologies (Nagaraj et al., 2024), but there is still much uncertainty about the best pedagogical practices and the most suitable AI technologies (Lee et al., 2024). A systematic review by Bond et al. (2024) reveals that AI is used in higher education particularly for automated assessment, student profiling, guidance, and student selection. Furthermore, many teachers acknowledge AI's potential in teaching in higher education to save time, assist in designing enriching activities, and personalise learning experiences (Alwaqdani, 2024). Chiu and colleagues' (2023) systematic literature review demonstrates that AI can be used in teaching by

providing adaptive teaching strategies, enhancing teachers' ability to teach, and supporting teachers' professional development.

Mah and Groß (2024) further posit that teachers particularly recognise the potential of AI, especially in the preparation of teaching. This highlights the importance of teachers' AI literacy skills, which enable them to critically evaluate and use AI safely and ethically in teaching (see Rasul et al., 2023). Using effective technology and innovative teaching strategies can also enhance student engagement (Desir et al., 2025), which should be considered as an important aspect of pedagogical practices. However, concerns have been raised regarding the workload required for training related to AI, the reduction of creativity and critical thinking due to AI usage, unintended consequences, and trust in AI's error-free performance (Alwaqdani, 2024), as well as the equitable access to AI tools (Nagaraj et al., 2024).

Pedagogical training is important to increase teachers' pedagogical and technological knowledge about AI in education (Nazaretsky et al., 2022). Teachers need pedagogical and ethical knowledge and skills to integrate AI into teaching and effectively utilise it in teaching (Celik, 2023; Cavalcanti et al., 2021; Nagaraj et al., 2023). This includes the importance of the teacher's role in overseeing AI use, ensuring transparency, traceability, and explainability of AI systems, and clearly communicating these aspects (Holmes et al., 2021; Nagaraj et al., 2024).

Self-efficacy for Using AI in Teaching

Self-efficacy refers to people's perceptions about their abilities to perform a particular task (Bandura, 1986, 1991). As such, it influences an individual's choices, goal setting, investment in tasks, and ability to persevere through difficulties (Bandura, 1991; Bruna et al., 2023). Correspondingly, self-efficacy for teaching is defined as teachers' belief of their ability to handle tasks, challenges, and obligations related to teaching and their professional role (Cao et al., 2018; Postareff et al., 2023; Zee & Koomen, 2016). Following the self-efficacy theory by Bandura (1991), it can be stated that teachers with strong self-efficacy tend to set higher goals for themselves and remain committed to achieving those goals. Self-efficacy has a crucial role in shaping commitment that individuals place on different tasks (Klaeijsen et al., 2017; Zee & Koomen, 2016). Those with strong self-efficacy are more likely to show greater interest and satisfaction in tasks where they feel competent and successful (Zee & Koomen, 2016). In fact, it has been suggested that perceived self-efficacy can predict intrinsic motivation better than actual ability (Bandura, 1986; Walker et al., 2006). In line with this, teachers' self-efficacy has been shown to be connected to their intrinsic motivation (Klaeijsen et al., 2017).

Recent research on university teachers has shown that university teachers' self-efficacy and their pedagogical practices are linked to each other (Cao et al., 2018; Postareff et al., 2023; Zee & Koomen, 2016). Furthermore, based on the previous research, it can be assumed that teaching experiences and self-efficacy are intertwined, and their links are multi-directional (Gale et al., 2021; Zee & Koomen, 2016). On the one hand, self-efficacy has been identified as a powerful conception connected to positive experiences of teaching (Gale et al., 2021). On the other hand, teachers' experiences in teaching shape their self-efficacy for teaching, especially at the early stage of their career (Zee & Koomen, 2016). For example, it has been found that early career university teachers are more likely

to report negative enactive experiences as decreasing their self-efficacy beliefs for teaching than teachers at the later stage of their career (Gale et al. 2021). Additionally, prior research has also shown that teacher training has a positive impact on university teachers' self-efficacy beliefs (Bruna et al., 2023; Postareff et al., 2007, 2008).

In this study, we focus on university teacher views on using AI in teaching. Self-efficacy for using AI in teaching reflects teachers' beliefs in their ability to effectively manage teaching tasks that involve AI. It also includes confidence in handling challenging teaching situations requiring AI, possessing the necessary pedagogical skills to use AI, and selecting appropriate AI applications for teaching (cf. Ng et al., 2023; Lindblom-Ylänne et al., 2006). Research on this is still scarce, but a recent study indicates that university teachers' self-efficacy for AI has a positive impact on the use of AI (Mah & Groß, 2024; see Oran, 2023). Since university teachers' self-efficacy has been shown to be an important element in influencing teaching (Cao et al., 2018; Postareff et al., 2023) and the use of the new pedagogical methods (Zee & Koomen, 2016), teacher self-efficacy is an important aspect to investigate in relation to university teachers' experiences in AI training, teaching experience, intrinsic motivation, and behavioural commitment to use AI and perspectives on AI ethics.

Intrinsic Motivation and Behavioural Commitment

The self-determination theory (SDT) is a framework for understanding elements that influence and facilitate an individual's intrinsic motivation, extrinsic motivation, and well-being (Ryan & Deci, 2020). It highlights the role of three basic psychological needs, namely autonomy (i.e., feeling of being in control of one's actions and decisions), competence (i.e., the feeling of being effective and capable of achieving desired outcomes) and relatedness (i.e., the feeling of being connected to others and experiencing a sense of belonging; Deci & Ryan, 2000). When these needs are satisfied, individuals experience higher levels of intrinsic motivation, leading to enhanced performance and persistence (Ryan & Deci, 2020; Uysal, 2023). Intrinsic motivation refers to engaging in an activity for its inherent satisfaction and interest, rather than for some separable consequence (Deci & Ryan, 2000). It can be distinguished from extrinsic motivation, which is closely associated with rewards and sanctions (Ryan & Deci, 2020). Intrinsic motivation is characterised by engaging in activities out of genuine interest and personal challenge, and it leads to enhanced performance and persistence (Ryan & Deci, 2020; Uysal, 2023). It has been found that this form of motivation is associated with stronger self-efficacy (Biggs & Tang, 2015; Klaeijsen et al., 2017; Oran, 2023).

Intrinsically motivated teachers tend to exhibit stronger behavioural commitment and persistence (Klaeijsen et al., 2017; Ryan & Deci, 2020; Uysal, 2023). Behavioural commitment refers to the level of dedication and involvement towards a specific behaviour or goal (Kell & Motowidlo, 2012; Ng et al., 2023). Although the present study primarily focuses on intrinsic motivation, external factors are very likely to play an important role in the background. Prior research has shown that intrinsic and extrinsic motivation are intertwined (Ryan & Deci, 2020). According to Mehdaoui's (2024) research, the external barriers identified by university teachers, such as technical complexity, inadequate training, limited resources, and large class sizes, negatively impacted the adoption of AI in teaching. It can be suggested that teachers' use of AI in education is influenced by both external and internal motivational factors (cf. Uysal, 2023) and these factors can also affect their behavioural commitment.

AI Ethics in Teaching

Ethical guidelines emphasise the importance of promoting diversity, non-discrimination, fairness, and social and ecological well-being when utilising AI in education (European Commission, 2019). AI ethics involves data ethics, algorithms, and computational approaches, while in education, it also includes teachers' expertise to recognise biases and power dynamics within pedagogical and assessment practices (Holmes et al., 2022). In accordance with these conceptualisations, the focus is directed towards the following aspects of AI ethics: safety, reliability, transparency and social good (Ng et al., 2023). Safety emphasises that AI systems should perform safely, respect privacy, and meet ethical and legal standards. Reliability refers to the need for AI systems to operate consistently and dependably, ensuring accountability. Transparency focuses on making AI systems understandable and clear, with users being informed about their purpose, functionality, and limitations. Social good highlights the importance of minimizing data bias, benefiting everyone, and striving to achieve common good (see Ng et al., 2023).

Thus, understanding AI ethics is fundamental for the ethical design of AI use in teaching (Holmes et al., 2021). Prior studies highlight concerns about the lack of ethical consideration in AI application usage in higher education, as well as the importance of integrating AI use into curriculum design from the outset (Bond et al., 2024; Ogunleye et al., 2024). The responsibility for ethical and secure use of AI, as well as for knowing and following ethical guidelines, largely falls on the student and the university teacher (see e.g., University of Eastern Finland, 2024; University of Helsinki, 2024). Therefore, it is crucial for university teachers to adopt a proactive and ethical approach to the use of AI in teaching (Cotton et al., 2023).

Aims

The study explores the relationships between teachers' self-efficacy beliefs, intrinsic motivation, and behavioural commitment to using AI in teaching as well as university teacher perspectives on AI ethics. It also examines how teaching experience and participation in AI training are connected to these aspects and teachers' views on the possibilities of using AI in teaching. Our specific research questions are

1. What are the interrelations between university teachers' self-efficacy for using AI in teaching, intrinsic motivation, behavioural commitment, and teachers' perspectives on AI ethics?
2. How do university teachers' teaching experience and participation in AI training relate to their self-efficacy for using AI in teaching, intrinsic motivation, behavioural commitment and perspectives on AI ethics?
3. What kind of possibilities for using AI in teaching do university teachers with or without AI training report?

Method

Context and Participants

This mixed methods research was conducted at a multidisciplinary, research-intensive Finnish university.

Altogether 92 university teachers from the university participated in this study. There were 60 female (65%) and 30 (33%) male participants. Furthermore, one participant did not wish to disclose this information, and one answered with the option 'other'. The participants had diverse fields as their branch of science including all the four faculties and independent institutes of the university under study. 88 (96%) of the participants had participated in pedagogical training. The participants had varying years of teaching experience. 36 percent of teachers had zero to seven years teaching experience, 22 percent had eight to fifteen years, and 42 percent reported having more than fifteen years of teaching experience.

The data were collected in the year 2024 with an online questionnaire. Teachers were invited to participate through the university's internal communications. Participation was on a voluntary basis and strictly confidential. The study followed the EU General Data Protection Regulation Act (1050/2018) and ethical guidelines of research with human participants by Finnish National Board on Research Integrity (2019).

Measures

The data included survey responses and open-ended answers. Teachers' self-efficacy for using AI in teaching (four items) was measured by using the modified Self-efficacy beliefs in teaching scale (Lindblom-Ylänne et al., 2006). Additionally, the AI self-efficacy scale from Artificial Intelligence Literacy Questionnaire (Ng et al., 2023) was used to re-write the items in this scale. The original version of Self-efficacy beliefs in teaching scale has been tested and reported in several prior studies (Cao et al., 2018; Postareff et al., 2023). Furthermore, teachers' intrinsic motivation for using AI (four items), behavioural commitment (three items) and perspectives on AI ethics (12 items) were measured by using modified Artificial Intelligence Literacy Questionnaire (AILQ; Ng et al., 2023).

For the purposes of this study, the survey was rewritten and contextualised into the university context. A 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used to measure all the items. Participation in AI training was measured with a question whether teacher has attended AI training or education (1 = yes, 2= no). The teachers' teaching experience was measured as follows: seven years or less, between eight and 15 years, and more than 15 years. The AI use in teaching was measured with a question "Do you use AI in your teaching? (1 = yes, 2= no). The survey included an open-ended question where teachers were asked to describe what kind of possibilities they see in using AI in teaching and to give concrete examples of their use of AI in teaching.

Analyses

This study combined quantitative and qualitative analyses. First, we used exploratory factor analysis (EFA) to explore the factor structure of the scales and to evaluate how the contextualised survey items worked in the new context. Five set of items (i.e., four items measuring self-efficacy for using AI in teaching, four items measuring intrinsic motivation, three items measuring behavioural commitment, and twelve items measuring AI ethics) were separately subjected to an explorative factor analysis. Maximum Likelihood was used for extraction and Direct Oblimin for rotation (Costello & Osborne, 2005). The examination of Kaiser-Mayer Olkin test suggested that the

data can be considered acceptable to conduct factor analysis: self-efficacy for using AI in teaching (KMO=.785), intrinsic motivation (KMO=.753), behavioural commitment (KMO=.721), and AI ethics (KMO=.780).

A one-factor solution was identified for self-efficacy for using AI in teaching, intrinsic motivation, and behavioural commitment. These findings are in line with previous research (see Lindblom-Ylänne et al., 2006; Ng et al., 2023). For AI ethics, EFA showed a two-factor solution. Both one-factor and two-factor structures have been reported in the prior study by Ng et al. (2023). One item (*Misuse of AI could result in substantial risk to humans*) had low communality (i.e., below the desired .40; Costello & Osborne, 2005). Additionally, one item (*AI systems need to be subjected to rigorous testing to ensure they work as expected*) cross loaded on both factors with low loadings. Therefore, we decided to remove these two items from subsequent analysis. The resulting two-factor solution was theoretically sound. We decided to name the AI ethics factors as Safety and reliability (five items) and Transparency and social good (five items). The Cronbach's alphas for all scales were good, above .80 (Nunnally & Bernstein, 1994, pp. 264-266). Appendix A describes the final solutions, items, and Cronbach's alphas.

In the second phase of analysis, we analysed the relationship between self-efficacy for using AI in teaching, intrinsic motivation, behavioural commitment, and perspectives in AI ethics with correlation (Pearson). Furthermore, an independent *t*-test was used to investigate if there were differences between teachers who had participated in AI training (n= 61) and those who had not (n= 30). Analyses of variance (ANOVA) were used to explore the relationship between teaching experience, self-efficacy for using AI in teaching, intrinsic motivation, behavioural commitment, and perspectives in AI ethics. The effect sizes were calculated using Cohen's d (Cohen, 1977). SPSS Statistics version 29 was used for the quantitative analyses.

Thereafter, teachers' open-ended answers were analysed using qualitative content analysis with an inductive approach (Elo et al., 2014). The analysis focused on the teachers' views on the possibilities for using AI in teaching. First, teachers' expressions related to using AI in teaching were systematically identified and coded for further analysis. Next, the coded aspects in each open-ended answer were grouped under the categories. A total of three main categories were found. For more detailed descriptions of the categories, see the Results section. In the final phase, we explored the similarities and differences in the identified categories between teachers with and without AI training.

Results

The Relationship Between Self-Efficacy for Using AI in Teaching, Intrinsic Motivation, Behavioural Commitment, and AI Ethics

First, we focus on the descriptive results. Most of the respondents (66%, n= 61) had participated in AI training. The descriptive results revealed that the mean scores on self-efficacy for using AI in teaching (M=3.12; SD 1.09) and intrinsic motivation (M=3.17; SD 1.02) were above the average rate but the lowest compared to other measures. For behavioural commitment, the results showed that the mean score was quite high (M=3.54; SD=.978). Regarding AI ethics, teachers scored high on safety and reliability (M=4.84; SD=.351) as well as

transparency and social good (M=4.53; SD=.555). The standard deviation was the lowest for safety and reliability as well as transparency and social good compared to other measures.

In the first research question, we analysed the interrelations between self-efficacy for using AI in teaching, intrinsic motivation, behavioural commitment, and AI ethics. Pearson's correlation showed that self-efficacy for using AI in teaching, intrinsic motivation, and behavioural commitment correlated positively to each other at significant levels. Safety and reliability had a positive correlation with transparency and social good. Table 1 displays the Pearsons' correlations.

Table 1. Pearson's Correlations of the Measures

		1.	2.	3.	4.	5.
1.	Self-efficacy for using AI in teaching	-				
2.	Intrinsic motivation	.550**	-			
3.	Behavioural commitment	.764**	.798**	-		
4.	Transparency and social good	.088	.067	.085	-	
5.	Safety and reliability	-.095	-.150	-.052	.511**	-

**. Correlation is significant at the 0.01 level (2-tailed).

AI Training and Teaching Experiences

In the second research question, we explored how participation in AI training and teaching experience were related to self-efficacy for using AI in teaching, intrinsic motivation, behavioural commitment, and AI ethics. The results showed that teachers who had participated in AI training reported statistically significant higher scores on self-efficacy for using AI in teaching, intrinsic motivation, and behavioural commitment (see Table 2). No significant differences in AI ethics (i.e., transparency and social good; safety and reliability) were found between teachers with and without AI training in terms of these mean scores. Effect sizes were large (>.8; Cohen, 1977). The findings also indicated that teaching experience was not statistically significantly related to self-efficacy for using AI in teaching, intrinsic motivation, behavioural commitment, and AI ethics (see Table 3).

Table 2. Participation in AI Training and Related Factors

AI training	Teachers with AI training (n=61) M (SD)	Teachers without AI training (n=31) M (SD)	t	p
Self-efficacy for using AI in teaching	3.33 (1.06)	2.72 (1.05)	2.64	.010*
Intrinsic motivation	3.36 (.98)	2.78 (.99)	2.65	.009*
Behavioural commitment	3.77 (.90)	3.08 (.98)	3.40	.000**
Transparency and social good	4.61 (.50)	4.37 (.63)	1.84	.072
Safety and reliability	4.86 (.24)	4.78 (.50)	.839	.407

**p. <0.001, * p <0.05

Table 3. Teaching Experience and AI-Related Factors

Teaching experience	0-7 years (n=33) M (SD)	8-15 years (n=20) M (SD)	More than 15 years (n=39) M (SD)	F	p
Self-efficacy for using AI in teaching	3.02 (1.05)	3.64 (1.04)	2.94 (1.09)	3.05	.052
Intrinsic motivation	3.04 (.97)	3.39 (.82)	3.16 (1.56)	.727	.486
Behavioural commitment	3.43 (.82)	4.00 (.82)	3.38 (1.12)	3.02	.054
Transparency and social good	4.55 (.49)	4.39 (.63)	4.57 (.57)	.781	.461
Safety and reliability	4.79 (.46)	4.84 (.25)	4.83 (.35)	.497	.610

Possibilities for Using AI in Teaching

We identified three main categories relating to possibilities for using AI in teaching:

- The first category was labelled as *Teachers' work enhancement and teaching planning*, which refers to AI supporting teachers by enhancing their work in planning of teaching and content ideation, as well as providing tools that reduce workload and diversify pedagogical design.
- The second category *Enhancing student learning* indicates how AI can be utilised to support student learning with engaging tasks, developing generic skills, and promoting equal learning opportunities for all students.
- The third category descriptions emphasised *Unrealised possibilities and no possibilities*. This suggested that teachers either did not see any benefits in using AI or lacked sufficient knowledge of how to utilise it effectively, recognising nevertheless that AI may offer many possibilities both now and in the future.

The first category included three sub-categories: support for lesson planning and ideation, preparation of assignments and materials, information retrieval and processing, and enhancing work efficiency. The second category *Enhancing student learning* included three sub-categories, namely promoting student learning, fostering generic skills, and promoting equality. All extracts were labelled with a teacher code (1-92) and participation in AI training (Y= teacher with AI training; N= teacher without training).

The analysis revealed differences between teachers with and without AI training, as well as whether the responses were brief mentions (description) or included additional explanations (detailed description). Table 4 distinguishes between description and detailed description among teachers with and without training. This distinction provides a better understanding of the qualitative variation within the data. For example, a description is presented in the quote: "With the help of AI, I can generate ideas for my teaching tasks" (Y74), while a detailed description with explanation is illustrated in the quote: "Additionally, AI is helpful in creating summaries and abstracts, for example, Copilot generates notes from Teams lessons" (Y59).

Teachers' work enhancement and teaching planning were the most frequently mentioned category in both groups of teachers. In terms of support for lesson planning and ideation, the benefits of AI were described as diversifying ideation and supporting better lesson planning: "Generation of ideas, teaching processes, and assessment of learning" (N39). AI was found to assist in designing both existing and new courses, as well as in structuring lessons and themes, with respondents noting that AI "…diversifies ideation and planning phases, acting as a kind of critical colleague" (Y30).

In preparation of assignments and materials, AI was viewed as a tool that could even foster creativity, serving as a resource for questions and assisting in the formulation of teacher-designed assignments and instructional materials: "I also see the potential of AI in creating assignments where students are required to challenge themselves with the help of AI" (Y65). Additional possibilities included summarizing content, providing feedback, improving assessments, and formulating exam questions.

Table 4. Possibilities for using AI and AI Training Participation

Categories	Sub-categories	Teachers with AI training (f)	Teachers without AI training (f)
Teachers' work enhancement and teaching planning	Support for lesson planning and ideation	description (10) detailed description (2)	description (3)
	Preparation of assignments and materials	description (6) detailed description (4)	description (4) detailed description (4)
	Information retrieval and processing	description (3) detailed description (4)	description (3)
	Enhancing work efficiency	description (8) detailed description (3)	detailed description (3) description (1)
Enhancing student learning	Promoting student learning	description (1) detailed description (13)	
	Fostering generic skills	description (1) detailed description (4)	description (3)
	Promoting equality	detailed description (5)	detailed description (1)
Unrealised possibilities and no possibilities	Unrealised possibilities	description (1) detailed description (6)	detailed description (3)
	No possibilities	description (2)	description (1) detailed description (1)

In terms of information retrieval and processing, there were no differences between teachers with or without AI training. AI was used as a "search engine" (Y7) and for "information retrieval" (Y20) as well as for "organizing information" (N4). In handling scientific information, AI was noted to "provide a quick overview of various theories" (Y55). Similarly, it was mentioned that AI "enables the processing and summarizing of large data sets

quite well" (Y35). Perspectives on work efficiency were mostly highlighted by those with AI training with descriptions such as content generation, task checking, exam grading, and "time savings in material production and ideation" (Y18). Efficiency perspectives were described in various ways "for example, by creating and grading vocabulary tests" (Y5). Teachers with AI training noted possibilities in lesson planning more often than those without training like "support in designing and assessing my own courses, thereby easing my workload" (Y10). Likewise, those with training mentioned time-saving benefits in completing their tasks more often than those without training.

There were differences between those with and without AI training related to the category enhancing student learning. Only the participants with training brought up perspectives related to student learning in teaching, often providing detailed descriptions, such as: "Tasks can be formulated for AI together with students, and the answers can be discussed and evaluated collaboratively" (Y59). Both groups emphasised the importance of teaching generic skills in relation to AI usage, offering detailed descriptions. The respondents highlighted the significance of ethical skills, such as using 'AI as a key work-life competency '(Y33), alongside critical thinking skills, including the ability to 'critically evaluate information' (N3). Mostly, those with AI training presented possibilities, providing detailed descriptions of how AI could be utilised as a personal learning mentor to enhance equality, noting that it "enables equality, overcoming learning challenges, and opportunities for everyone to access information and learn new things" (Y32).

The respondents with AI training more frequently described in detail unrealised possibilities. Some acknowledged the limitless potential of AI, highlighting the continuous emergence of new opportunities. However, they also expressed challenges in articulating concrete examples. Some attributed this to a lack of knowledge and skills: "I know so little about the use of AI in teaching that I can't even answer this" (N58), or difficulties in seeing relevant significance for the use of AI in teaching "in an innovative way" (Y70). There were also more critical views among the teachers with no AI training, where AI was not seen to have any benefits in teaching, with detailed descriptions of it hindering teaching and the use of various assessment methods, with one respondent stating that "it undermines the trust between teacher and student" (N43).

Discussion

Findings in the Light of Previous Literature

The aim of the study was to examine university teachers' self-efficacy beliefs, intrinsic motivation, commitment to utilizing AI in teaching, and views on AI ethics and possibilities for using AI in teaching, as well as how teaching experience and participation in AI training are connected these factors. From the quantitative analyses, we found insights into factors related to university teachers' self-efficacy for using AI in teaching. This study highlights the importance of teacher self-efficacy for using AI in teaching and its relation to behavioural commitment, motivation to using AI, and participation in AI training (cf. Zee & Koomen, 2016). The findings showed that teachers' intrinsic motivation and behavioural commitment were positively related to self-efficacy for using AI in teaching, giving support to previous findings on the associations between teacher self-efficacy, motivation, and behavioural commitment (Kell & Motowidlo, 2012; Klaeijsen et al., 2017; Uysal, 2023).

The findings indicated a strong correlation between the dimensions of AI ethics, specifically transparency and social good as well as safety and reliability. Teachers scored highly on both dimensions. However, the results also indicated that teachers' perceptions of AI ethics were not significantly linked to any of the other explored aspects. Additionally, no differences in AI ethics were observed between teachers with and without AI training. The results highlight that teachers from diverse backgrounds emphasise the importance of ethical perspectives on AI, particularly the significance of safety, reliability, transparency, and social good. This is an important finding, as recognising ethical perspectives form the essential foundation for the educational use of AI (Holmes et al., 2022; Oran, 2023).

Our aim was to also explore how teaching experience and participation in AI training are associated with teachers' self-efficacy beliefs, intrinsic motivation, and behavioural commitment using AI. As one would expect, teachers who had participated in AI training reported higher self-efficacy for using AI in teaching than their peers who had not participated in AI training (cf. Oran, 2023). They also had significantly higher levels of intrinsic motivation and behavioural commitment using AI than their peers. Overall, these findings give support to the earlier understanding of the strong relationship between self-efficacy beliefs and training (Bruna et al., 2023; Postareff et al., 2007, 2008).

Teaching experience, in turn, was not connected to self-efficacy for using AI in teaching, behavioural commitment nor intrinsic motivation to use AI. These findings differ from earlier research that has found a connection between teacher self-efficacy and teaching experience (Gale et al., 2021; Zee & Koomen, 2016). Teaching experience was not associated with behavioural commitment and intrinsic motivation to use AI either. There is evidence that teaching experience alone does not enhance teachers' conceptions (Tuononen et al., 2023). Our findings highlight the power of social dynamics in shaping teachers' self-efficacy, attitudes and use of AI (Shata & Hartley, 2025).

Teachers' descriptions of their views on possibilities for using AI in teaching varied. While some teachers found AI beneficial for planning lessons and teaching materials, as well as for enhancing their own work efficiency (Chiu et al., 2023), some reported that AI does not offer any opportunities for teaching. In a similar vein, prior research mentions that AI can provide teachers with additional resources for planning and creating teaching materials (see Ghimire et al., 2024; Mah & Groß, 2024). Additionally, the results suggest that teachers with AI training emphasised AI as a tool to promote student learning.

Interestingly, the potential for developing generic skills and advancing equality through AI was also highlighted primarily by those with AI training. This aligns with previous research (Celik, 2023; Nazaretsky et al., 2022) that suggests pedagogical training is connected to teachers' understanding of how to use AI in education. The results also highlight the importance of sufficient pedagogical knowledge (Cavalcanti et al., 2021). The emphasis on using AI in teaching to promote equality can be viewed as a social good, highlighting an ethical perspective on AI's role in teaching (cf. Rasul et al., 2023). Previous studies have raised concerns about AI's impact on the development of students' creative and critical thinking skills (Alwaqdani et al., 2024). In the present study, university teachers also highlighted the importance of teaching ethical and critical thinking skills.

Methodological Reflections and Limitations

There are several limitations related to our study. The first limitation is that only a small number of university teachers participated in the study. Therefore, the generalisability of the results is somewhat limited. It is possible that teachers who decided to participate in our study felt more confident with AI in teaching. Nevertheless, the data provide insights into a very little researched topic. Additionally, the results are in line with previous teacher research, such as teacher self-efficacy. Second, we used a novel survey in the present study. The scales measuring AI ethics, intrinsic motivation, and behavioural commitment were originally designed to measure higher education students' experiences of them (Ng et al., 2023). Thus, we adapted these scales to the university teacher's perspective. In addition, we rewrote and contextualised the robust survey on teacher self-efficacy (Cao et al., 2018; Lindblom-Ylänne et al., 2006; Postareff et al., 2023) for using AI in teaching perspective. Hence, this study is the first to report how these scales functioned among university teachers. Therefore, the survey used in this study should be further tested in various contexts and developed as needed. Third, a single item was used to measure participation in AI training. The nature and length of the training were not considered. This is an important issue for future research.

Pedagogical Implications and Future Studies

Further AI training could aim to raise university teachers' awareness of their conceptions and motivations related to using AI. It is also worth pointing out that training can also enhance teachers' pedagogical competencies and give examples of how to integrate AI into teaching in a pedagogically relevant way. Teachers play a key role in shaping students' and future academics' skills and attitudes toward AI ethics, as teachers are the initiators of the pedagogical use of AI (Chan, 2023, Maunula & Lähdesmäki, 2022). We agree with Popenic et al. (2023) that in aligning the teaching mission with the university's core educational values, it is crucial to preserve diverse forms of critical thinking in education, ensuring that the allure of technological advancements does not overshadow other essential forms of intellectual engagement. Rasul et al. (2023) emphasise that university teachers' ability to utilise AI, particularly generative AI, in teaching is enhanced by focusing on AI literacy, developing ethical and responsible usage guidelines, creating assessment methods centred on learning processes, and addressing biases. A conscientious teacher can also promote these skills and competencies in students, and all these factors contribute to fostering academic integrity, innovation, and improving students' employability in rapidly evolving job markets (Rasul et al., 2023).

This study also highlights the need for AI guidelines for university teachers as well as integration of AI in the curriculum. With a variety of views on possibilities for using AI in teaching, the decision on how to address AI in teaching is likely to depend on the teachers' views about AI. Without making AI a visible part of the curriculum, there is a risk of not paying attention to these issues. University teachers' consensus on the importance of teaching AI ethics and enhancing critical thinking is likely to make agreement on learning outcomes easy.

In this study, the teachers suggested that AI enhances both their own work and planning of teaching by saving time (cf. Alwaqdani, 2024). It is important to support the sustainable use of AI in university teachers' work

ensuring that efficiency does not become an end itself but rather a means to enhance balance and enrich pedagogical practices. Future research should explore how teachers can effectively utilise AI applications and tools in teaching with an emphasis on identifying and fostering good pedagogical practices. Specifically, it is essential to examine how teachers understand general AI and its pedagogical applications, considering the associated ethical aspects. Furthermore, it is important to assess teachers' training needs related to the pedagogical use of AI. Such research would support the development of AI training, enabling teachers to integrate AI effectively and responsibly into their teaching practices. Longitudinal studies could provide deeper insights into the development of teacher training and perspectives on the use of AI in teaching.

Conclusions

This study enhances our understanding of the relationship between university teachers' self-efficacy beliefs for using AI in teaching, intrinsic motivation, behavioural commitment, and teacher descriptions of opportunities for using AI in teaching. It also suggests that this relation varies based on participation in AI training. Another significant finding is that university teachers emphasise the importance of ethical perspectives on AI. Additionally, teachers consider that AI is beneficial for enhancing their own teaching as well as student learning. Some teachers also highlight that there are still unexploited opportunities with AI in the realm of higher education.

Acknowledgements

Special thanks to Laura Mendoza for the revision and correction of the English language and Martta Jämsä for constructing the finalized research survey on the Webropol platform. We declare that we have no actual or perceived conflicts of interest. We have received funding for this manuscript solely through the allocation of academic time provided by our university. In the ideation, design, or actual writing process, we have not relied on AI. The present study has utilised AI in order to ensure grammatical accuracy in the translation of Finnish data examples into English. This has been achieved by employing Microsoft CoPilot Enterprise, a software solution that has been approved by the university.

References

Alwaqdani, M. (2024). Investigating teachers' perceptions of artificial intelligence tools in education: potential and difficulties. *Education and Information Technologies, 1–19.* https://doi.org/10.1007/s10639-024-12903-9

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Prentice Hall.

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes, 50(2), 248–287.* https://doi.org/10.1111/j.1468-5957.1988.tb00115.x

Bice, H., & Tang, H. (2022). Teachers' beliefs and practices of technology integration at a school for students with dyslexia: A mixed methods study. *Education and Information Technologies, 27(7), 10179–10205.* https://doi.org/10.1007/s10639-022-11044-1

Biggs, J., & Tang, C. (2015). Constructive alignment: An outcomes-based approach to teaching anatomy. In L.

K. Chan & W. Pawlina (Eds.), *Teaching anatomy* (pp. 31–38). Springer.

Bond, M., Khosravi, H., Laat, M., Bergdahl, N., Negrea, V., Oxley, E., Pham, P., Chong, S. W., & Siemens, G. (2024). A meta systematic review of artificial intelligence in higher education: A call for increased ethics, collaboration, and rigour. *International Journal of Educational Technology in Higher Education, 21(1), 1–41.* https://doi.org/10.1186/s41239-023-00436-z

Bruna, D., Pérez, M. V., Bustos, C., & Villarroel, V. (2023). The impact of a university teacher training program promoting self-regulated learning on teacher knowledge, self-efficacy, and practices. *Frontiers in Education, 8,* 1007137. https://doi.org/10.3389/feduc.2023.1007137

Cao, Y., Postareff, L., Lindblom, S., & Toom, A. (2018). Teacher educators' approaches to teaching and the nexus with self-efficacy and burnout: Examples from two teachers' universities in China. *Journal of Education for Teaching, 44(4), 479–495.* https://doi.org/10.1080/02607476.2018.1450954

Cascella, M., Montomoli, J., Bellini, V., & Bignami, E. (2023). Evaluating the feasibility of ChatGPT in healthcare: An analysis of multiple clinical and research scenarios. *Journal of Medical Systems, 47(1), 1–5.* https://doi.org/10.1007/s10916-023-01925-4

Cavalcanti, A. P., Barbosa, A., Carvalho, R., Freitas, F., Tsai, Y. S., Gašević, D., & Mello, R. F. (2021). Automatic feedback in online learning environments: A systematic literature review. *Computers & Education: Artificial Intelligence, 2,* 100027. https://doi.org/10.1016/j.caeai.2021.100027

Celik, I. (2023). Towards Intelligent-TPACK: An empirical study on teachers' professional knowledge to ethically integrate artificial intelligence (AI)-based tools into education. *Computers in Human Behavior, 138,* 107468. https://doi.org/10.1016/j.chb.2022.107468

Chan, C. K. Y. (2023). A comprehensive AI policy education framework for university teaching and learning. *International Journal of Educational Technology in Higher Education, 20(1),* 38. https://doi.org/10.1186/s41239-023-00408-3

Chiu, T. K. F., Xia, Q., Zhou, X., Chai, C. S., & Cheng, M. (2023). Systematic literature review on opportunities, challenges, and future research recommendations of artificial intelligence in education. *Computers and Education: Artificial Intelligence, 4,* 100118. https://doi.org/10.1016/j.caeai.2022.100118

Cohen, J. (1977). *Statistical power analysis for the behavioral sciences.* Elsevier Science & Technology.

Costello, A. B., & Osborne, J. (2005). Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis. *Practical Assessment, Research and Evaluation, 10(7), 1–9.* https://doi.org/10.7275/jyj1-4868

Cotton, D. R. E., Cotton, P. A., & Shipway, J. R. (2023). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. *Innovations in Education and Teaching International, 61(2), 228–239.* https://doi.org/10.1080/14703297.2023.2190148

Crompton, H., & Burke, D. (2023). Artificial intelligence in higher education: the state of the field. *International Journal of Educational Technology in Higher Education, 20(22), 1–22.* https://doi.org/10.1186/s41239-023-00392-8

Deci, E., & Ryan, R. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behaviors. *Psychological Inquiry, 11(4), 227–268.* https://doi.org/10.1207/S15327965PLI1104_01

Desir, C., Argüello, G., Panton, R., Farraj, A., & Sylvain, J. (2025). In their words: Assessing undergraduate intellectual curiosity across home, classroom, and digital landscapes. International Journal on Social and

Education Sciences (IJonSES), 7(1), 1–24. https://doi.org/10.46328/ijonses.732

Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K., & Kyngäs, H. (2014). Qualitative content analysis: A focus on trustworthiness. *SAGE Open, 4(1),* 215824401452263. https://doi.org/10.1177/2158244014522633

Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: How knowledge, beliefs, and culture intersect. *Journal of Research on Technology in Education, 42(3), 255–284.* https://doi.org/10.1080/15391523.2010.10782551

Ertmer, P. A., Ottenbreit-Leftwich, A., & Tondeur, J. (2015). Teacher beliefs and uses of technology to support 21st century teaching and learning. In H. R. Fives & M. Gill (Eds.), *International Handbook of Research on Teacher Beliefs* (pp. 403–418). Routledge - Taylor & Francis.

European Commission. (2024). Regulatory framework on Artificial Intelligence (AI). Retrieved December 4, 2024, from https://digitalstrategy.ec.europa.eu/en/policies/regulatory-framework-ai

European Commission. (2019). Ethics guidelines for trustworthy AI. Directorate-General for Communications Networks, Content and Technology, Publications Office. https://data.europa.eu/doi/10.2759/068692

Finnish National Board on Research Integrity. (2019). Guidelines for ethical review in human sciences. Publications of the Finnish National Board on Research Integrity, 3. Retrieved December 4, 2024, from https://tenk.fi/en/advice-and-materials/guidelines-ethical-review-human-sciences

Fowler, D. S. (2023). AI in higher education: Academic integrity, harmony of insights, and recommendations. *Journal of Ethics in Higher Education, 3,* 127–143. https://doi.org/10.26034/fr.jehe.2023.4657

Gale, J., Alemdar, M., Cappelli, C., & Morris, D. (2021). A mixed methods study of self-efficacy, the sources of self-efficacy, and teaching experience. *Frontiers in Education, 6,* 750599. https://doi.org/10.3389/feduc.2021.750599

Ghimire, A., Prather, J., & Edwards, J. (2024). Generative AI in education: A study of educators' awareness, sentiments, and influencing factors. *ArXiv,* preprint arXiv:2403.15586.

Hasanein, A. M., & Sobaih, A. E. E. (2023). Drivers and consequences of ChatGPT use in higher education: Key stakeholder perspectives. *European Journal of Investigation in Health, Psychology and Education, 13(11),* 2599–2614. https://doi.org/10.3390/ejihpe13110181

Holmes, W., Persson, J., Chounta, I.-A., Wasson, B., & Dimitrova, V. (2022). Artificial intelligence and education: A critical view through the lens of human rights, democracy and the rule of law. *Council of Europe.* https://rm.coe.int/artificial-intelligence-and-education-a-critical-view-through-the-lens/1680a886bd

Holmes, W., & Porayska-Pomsta, K. (Eds.). (2022). *The ethics of artificial intelligence in education: Practices, Challenges, and Debates* (1st ed.). Routledge. https://doi.org/10.4324/9780429329067

Holmes, W., Porayska-Pomsta, K., Holstein, K., Sutherland, E., Baker, T., Buckingham Shum, S., Santos, O. C., Rodrigo, M. T., Cukurova, M., Bittencourt, I. I., & Koedinger, K. R. (2021). Ethics of AI in education: Towards a community-wide framework. *International Journal of Artificial Intelligence in Education, 32,* 504–526. https://doi.org/10.1007/s40593-021-00239-1

Kaplan-Rakowski, R., Grotewold, K., Hartwick, P., & Papin, K. (2023). Generative AI and teachers' perspectives on its implementation in education. *Journal of Interactive Learning Research, 34(2),* 313–338.

Kell, H. J., & Motowidlo, S. J. (2012). Deconstructing organizational commitment: Associations among its affective and cognitive components, personality antecedents, and behavioral outcomes. *Journal of Applied Social Psychology, 42(1),* 213–251. https://doi.org/10.1111/j.1559-1816.2011.00874.x

Klaeijsen, A., Vermeulen, M., & Martens, R. (2017). Teachers' innovative behaviour: The importance of basic psychological need satisfaction, intrinsic motivation, and occupational self-efficacy. *Scandinavian Journal of Educational Research, 62(5),* 769–782. https://doi.org/10.1080/00313831.2017.1306803

Lee, D., Arnold, M., Srivastava, A., Plastow, K., Strelan, P., Ploeckl, F., Lekkas, D., & Palmer, E. (2024). The impact of generative AI on higher education learning and teaching: A study of educators' perspectives. *Computers and Education: Artificial Intelligence, 6,* 100221. https://doi.org/10.1016/j.caeai.2024.100221

Lindblom-Ylänne, S., Trigwell, K., Nevgi, A., & Ashwin, P. (2006). How approaches to teaching are affected by discipline and teaching context. *Studies in Higher Education, 31(3),* 285–298.

Mah, D. K., & Groß, N. (2024). Artificial intelligence in higher education: exploring faculty use, self-efficacy, distinct profiles, and professional development needs. *International Journal of Educational Technology in Higher Education, 21(1),* 58. https://doi.org/10.1186/s41239-024-00490-1

Maunula, M., & Lähdesmäki, S. (2022). Student teachers' perceptions of the connection between literacy, equality and digitalization. International Journal on Social and Education Sciences (IJonSES), 4(3), 323–337. https://doi.org/10.46328/ijonses.392

Mehdaoui, A. (2024). Unveiling barriers and challenges of AI technology integration in education: Assessing teachers' perceptions, readiness and anticipated resistance. *Futurity Education, 4(4),* 95–108. https://doi.org/10.57125/FED.2024.12.25.06

Nagaraj, B. K., Kalaivani, A., Begum, S., Akila, S., & Sachdev, H. K. (2023). The emerging role of artificial intelligence in stem higher education: A critical review. *International Research Journal of Multidisciplinary Technovation, 5(5),* 1–19. https://doi.org/10.54392/irjmt2351.

Nazaretsky, T., Ariely, M., Cukurova, M., & Alexandron, G. (2022). Teachers' trust in AI-powered educational technology and a professional development program to improve it. *British Journal of Educational Technology, 53(4),* 914–931. https://doi.org/10.1111/bjet.13232

Ng, D. T. K., Wu, W., Leung, J. K. L., Chiu, T. K. F., & Chu, S. K. W. (2023). Design and validation of the AI literacy questionnaire: The affective, behavioural, cognitive and ethical approach. *British Journal of Educational Technology, 55(3),* 1082–1104. https://doi.org/10.1111/bjet.13411

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.

Ogunleye, B., Zakariyyah, K. I., Ajao, O., Olayinka, O., & Sharma, H. (2024). A systematic review of generative AI for teaching and learning practice. *Education Sciences, 14(6),* 636. https://doi.org/10.3390/educsci14060636

Oran, B. B. (2023). Correlation between artificial intelligence in education and teacher self-efficacy beliefs: a review. *RumeliDE Dil ve Edebiyat Araştırmaları Dergisi, 34,* 1354–1365. https://doi.org/10.29000/rumelide.1316378

Popenici, S., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *Research and Practice in Technology Enhanced Learning, 12(1),* 22. https://doi.org/10.1186/s41039-017-0062-8

Popenici, S., Rudolph, J., Tan, S., & Tan, S. (2023). A critical perspective on generative AI and learning futures. An interview with Stefan Popenici. *Journal of Applied Learning and Teaching, 6(2),* 1–21. Advanced online publication. https://doi.org/10.37074/jalt.2023.6.2.5

Postareff, L., Lahdenperä, J., Hailikari, T., & Parpala, A. (2023). The dimensions of approaches to teaching in higher education: a new analysis of teaching profiles. *Higher Education, 88(1),* 37–59. https://doi.org/10.1007/s10734-023-01104-x

Postareff, L., Lindblom-Ylänne, S., & Nevgi, A. (2008). A follow-up study of the effect of pedagogical training on teaching in higher education. *Higher Education, 56,* 29–43. https://doi.org/10.1007/s10734-007-9087-z

Postareff, L., Lindblom-Ylänne, S., & Nevgi, A. (2007). The effect of pedagogical training on teaching in higher education. *Teaching and Teacher Education, 23(5),* 557–571. https://doi.org/10.1016/j.tate.2006.11.013

Rasul, T., Nair, S., Kalendra, D., Robin, M., de Oliveira Santini, F., Ladeira, W. J., Sun, M., Day, I., Rather, R. A., & Heathcote, L. (2023). The role of ChatGPT in higher education: Benefits, challenges, and future research directions. *Journal of Applied Learning and Teaching, 6(1),* 41–56. https://doi.org/10.37074/jalt.2023.6.1.29

Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology, 61,* 101860. https://doi.org/10.1016/j.cedpsych.2020.101860

Shata, A., & Hartley, K. (2025). Artificial intelligence and communication technologies in academia: Faculty perceptions and the adoption of generative AI. International Journal of Educational Technology in Higher Education, 22(14). https://doi.org/10.1186/s41239-025-00511-7

Tuononen, T., Hyytinen, H., Kleemola, K., Hailikari, T., & Toom, A. (2023). Generic skills in higher education - teachers' conceptions, pedagogical practices and pedagogical training. *Teaching in Higher Education,* 1–18. https://doi.org/10.1080/13562517.2023.2248003

University of Eastern Finland. (2024). The use of AI in teaching and research. Retrieved October 23, 2024, from https://kamu.uef.fi/en/tietopankki/students-rights-and-obligations/the-use-of-ai-in-teaching-and-research/

University of Helsinki. (2024). Artificial intelligence in teaching. Retrieved October 23, 2024, from https://teaching.helsinki.fi/instructions/article/artificial-intelligence-teaching

Uysal, D. (2023). A review on teachers' and teacher candidates' intrinsic motivation: Self-determination theory perspective. *Language Teaching and Educational Research, 6(2),* 176–198. https://doi.org/10.35207/later.1331081

Walker, C. O., Greene, B. A., & Mansell, R. A. (2006). Identification with academics, intrinsic/extrinsic motivation, and self-efficacy as predictors of cognitive engagement. *Learning and Individual Differences, 16(1),* 1–12. https://doi.org/10.1016/j.lindif.2005.06.004

Wartman, S. A., & Combs, C. D. (2018). Medical education must move from the information age to the age of artificial intelligence. *Academic Medicine, 93(8),* 1107–1109. https://doi.org/10.1097/ACM.0000000000002044

Zee, M., & Koomen, H. M. Y. (2016). Teacher self-efficacy and its effects on classroom processes, student academic adjustment, and teacher well-being: A synthesis of 40 years of research. *Review of Educational*

Research, 86(4), 981–1015. https://doi.org/10.3102/0034654315626801

Author Information

Sirkku Lähdesmäki, PhD

https://orcid.org/0000-0002-8622-0076

School of Educational Sciences and Psychology

University of Eastern Finland

Yliopistonkatu 7, 80130 Joensuu

Finland

Contact e-mail: *sirkku.lahdesmaki@uef.fi*

Sanna Väisänen, PhD

https://orcid.org/0000-0002-2981-912X

School of Educational Sciences and Psychology

University of Eastern Finland

Yliopistonkatu 7, 80130 Joensuu

Finland

Heidi Hyytinen, Professor

https://orcid.org/0000-0002-5078-1429

School of Educational Sciences and Psychology

University of Eastern Finland

Yliopistonkatu 7, 80130 Joensuu

Finland

Appendix A. The Final Scales, Items and Cronbach's Alphas

Scales	Items	Cronbach's alphas
Intrinsic motivation	Artificial intelligence is relevant to my everyday life. Learning artificial intelligence is interesting. Learning artificial intelligence makes my everyday life more meaningful. I am interested in discovering new artificial intelligence technologies.	.876
Behavioral commitment	I will continue to use artificial intelligence in the future. I will keep myself updated with the latest AI technologies. I will spend time exploring new features of AI applications in the future.	.870
Self-efficacy for using AI in teaching	I believe I can cope with teaching tasks that require artificial intelligence. I am confident that I can handle even the most difficult teaching situations that require artificial intelligence. I am confident that I have necessary pedagogical skills to use AI in teaching. I am confident that I can choose appropriate AI applications for teaching.	.931
	AI ethics	
Safety and reliability	Ethical perspectives are important in the development and use of AI technology. AI systems should perform reliably and safely. AI systems should respect privacy. People should be accountable for using AI systems. AI systems should meet ethical and legal standards.	.805
Transparency and social good	AI systems should minimize data bias (e.g., gender, ethnicity). AI systems should benefit everyone. AI systems should be transparent and understandable. Users should be made aware of the purpose of the AI systems, how those work and what limitations may be expected. The use of AI should aim to achieve common good (e.g., environmental & poverty issues).	.816