AI AND TEACHERS' COMPETENCIES, PERCEPTIONS, AND WELL-BEING

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Abstract:

In the new digital and AI era, hybrid teaching models increasingly incorporate intelligent resources into everyday practice. The main aim of this paper is to analyze how teachers perceive their AI competencies, the purposes for which they apply AI in teaching practice, and how confident they feel when integrating intelligent models into their teaching practices. A quantitative survey was conducted in Serbia, involving 80 teachers from diverse fields and educational levels. The questionnaire combined items on digital and AI competencies with questions addressing teachers' self-perceptions and the psychological effects of AI integration. Results show that teachers primarily associate educational technology with AI, use it mainly for lesson preparation, and report psychological effects such as enhanced confidence, motivation, and innovation. At the same time, ambivalence and uneven adoption highlight challenges, including limited experience, lack of training, and concerns about risks. The study contributes empirical evidence to the emerging field of teacher AI competence research, situating Serbian educators' perspectives within the broader international discourse. It underscores the importance of professional development and supportive environments to ensure that AI integration fosters pedagogical innovation and promotes teacher well-being.

Keywords:

Artificial Intelligence in Education, Teacher Competencies, Digital Pedagogy, Psychological Effects, Digital Well-Being.

INTRODUCTION

The rapid digital transformation of education has introduced artificial intelligence (AI) tools into everyday teaching practice, reshaping both pedagogical approaches and professional identities. International frameworks highlight the urgency of preparing educators for this shift. The *AI Competency Framework for Teachers* [1] emphasizes the need for technical proficiency, ethical awareness, and pedagogical adaptability. Similarly, digital pedagogy requires attention to the ethical, psychological, and pedagogical implications of technology use in classrooms [2]. The *DigCompEdu Framework* [3] provides a model for developing educators' digital competencies, which now need to be extended to AI-related skills. As AI technologies become more integrated into education, teacher competencies must expand beyond traditional digital literacy to include the ability to critically evaluate, adapt, and apply AI in pedagogical contexts [4], [5].

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DOI: 10.15308/Sinteza-2026-471-477

These innovations also affect teachers' psychological responses to technology integration, influencing stress, motivation, and perceptions of control [5]. Evaluating AI competence levels and promoting safe, supportive learning environments are therefore valuable steps in transitioning to AI-supported education [4]. Despite growing interest, research on teacher AI competence remains at an early stage, focusing mainly on theoretical discussions and qualitative studies [4], [5]. Empirical evidence is still limited regarding how teachers perceive these competencies and how AI tools affect their well-being and job satisfaction [6], [7]. More studies are needed to examine teachers' perceptions in specific educational contexts, including their familiarity with AI tools, integration into practice, and the opportunities and challenges they encounter [8]. Teacher well-being is also considered part of the psychological effects of AI integration, including motivation, confidence, workload, and stress [9],[7]. In the Serbian academic context, recent research has highlighted how university teachers perceive digitalization and artificial intelligence ambivalently in their teaching practice [10]. The present study explores further teachers' self-perceptions of AI competencies and the psychological effects associated with AI integration in the classroom in the Serbian context. Specifically, it explores three hypotheses: (1) teachers' association of AI with educational technology, (2) the purpose of AI use in teaching practice, and (3) the psychological dimension of AI integration, including confidence, motivation, and innovation.

2. THEORETICAL BACKGROUND

Modernization of education at all levels has been identified as a strategic priority to ensure that teachers and learners develop the competences required to use digital technologies in rapidly changing environments [11]. Within this context, the digital transformation of education has introduced artificial intelligence tools into everyday teaching practice, influencing teachers' perceptions and beliefs and promoting AI literacy [12]. This change is closely linked to the integration of digital technologies, which have altered not only classroom practices but also the broader learning environment, enabling autonomy, flexibility, and access to resources. In line with global educational trends, and particularly accelerated during the COVID-19 pandemic, the role of educators in the Serbian context has shifted from being the central source of knowledge to acting as moderators and facilitators, while students increasingly assume active roles and autonomously access learning content in digital environments [13].

Recent frameworks on smart technologies in education [2] and AI competencies [1] highlight that educators must develop technical proficiency, ethical awareness, and pedagogical adaptability to integrate AI responsibly, and that digital pedagogy requires sensitivity to ethical, psychological, and pedagogical implications. Effective learning is reported by teachers in a higher education context as a balance between traditional and technology-enhanced approaches [14], while, from the students' perspective, AI tools such as chatbots can support learning through feedback, interaction, and support outside the classroom; but within the classroom, digital tools are complementary rather than substitutive of the teacher's role [15]. This emphasis on the socio-emotional component of teaching and classroom interaction is crucial for effective learning in blended environments, where educators report both the benefits and challenges of technology-mediated communication with students [16], as well as the effectiveness of presenting learning content in hybrid formats [17]. Similarly, research indicates that teachers' perceptions and attitudes toward AI tools are shaped not only by their digital competence but also by psychological dimensions such as stress, workload, motivation, and well-being [1], [2], [7]. These aspects can be understood as teachers' ability to critically evaluate and adapt AI in pedagogical contexts, and as the socio-emotional element reflecting their responses to risks and the impact of technology on professional identity.

Recent frameworks and studies support this perspective, highlighting both the knowledge and skills required for AI integration [1], [2], [12] and the psychological implications for teacher workload, motivation, and well-being [5],[6],[7]. The recent initiative on whole-school digital well-being [9] underscores the importance of promoting awareness of risks and implementing concrete strategies that support healthy technology use. It proposes educational training, guidance, and accessible materials, with the aim of integrating digital well-being into everyday school practice through the responsible and healthy use of AI technology, where teachers' psychological responses, such as stress, motivation, and job satisfaction, are related to the use of technologies. Beyond education, AI integration and related competencies are examined in diverse professional human-interaction fields, such as customer relations and marketing, where intelligent applications analyze behaviour, optimize communication, and improve workflows [18]. These findings reinforce the importance of balanced AI integration, linking digital well-being with AI applications and the impact on educators' professional and socio-emotional lives.

In addition, recent empirical studies confirm that teachers' ambivalent attitudes toward AI reflect both optimism about its potential to enhance efficiency and learning outcomes and concern about risks such as plagiarism, diminished critical thinking, and the dehumanisation of education [8], [10]. The view of AI's future impact on teaching is, on the one hand, positive, for making teaching more efficient and improving students' learning, but also negative, for diminishing critical thinking, autonomy, and potentially dehumanising education [10].

This duality reinforces the importance of integrating the psychological aspect into AI competency frameworks. More studies are needed to examine teachers' perceptions in specific educational contexts, including their familiarity with AI tools, integration into practice, and the opportunities and challenges they encounter [8].

A recent survey of 141 university teachers in Serbia across all scientific fields found that educators possess strong digital competences but require further training to apply AI effectively in the classroom. While digital tools are widely used, AI is employed only occasionally, with notable differences [10], where teachers expressed awareness of risks, particularly non-ethical use, negative effects on students' personal and social competences, and potential misuse of technology. AI integration affects not only teacher competencies and practice, but also their workload, motivation, and well-being [6], [7]. Building on this perspective, our research examines how Serbian educators perceive AI in relation to their digital competence, workload, and use in practice.

While existing studies provide valuable insights, advancing the field requires the inclusion of updated data, perspectives from local educational contexts, and contributions from diverse disciplines that reflect the complexity of AI integration in teaching and learning. This study examines teachers' self-perceptions and the psychological effects associated with AI integration across various educational environments in Serbia. By situating these findings within the broader literature, the research contributes to understanding how global debates on AI in education reflect local realities.

3. RESEARCH METHODOLOGY AND RESEARCH RESULTS

To address the described objectives, the research employed a survey to examine teachers' perceptions of AI competencies and the psychological effects of AI integration across different teaching contexts. The study was conducted in Serbia, primarily in the regions of Niš, Belgrade, and the surrounding areas, during the first months of 2026 and included 80 educators, participants from diverse fields, ensuring representation across disciplines and educational levels. The survey instrument combined items on digital and AI competencies with questions addressing teachers' self-perceptions of AI competencies and psychological aspects. In line with the frameworks discussed previously, the questionnaire was structured to reflect both teachers' ability to evaluate and adapt AI tools (informational-cognitive dimension) and their socio-emotional responses. Data were collected through an online questionnaire and analyzed using descriptive statistical methods, including frequency distributions, percentages, graphical representations, and measures of central tendency. This approach provided both a broad overview of teachers' competencies and attitudes and a nuanced understanding of the psychological factors influencing AI adoption in teaching practice. The sample consisted of 80 teachers (88.8% female and 11.3% male) from all educational levels and contexts (primary, secondary, undergraduate, and master's programs). Among them, 25 were foreign language teachers. The survey was conducted through an online questionnaire between January and March 2026. For this paper, a selected section of a broader questionnaire was analyzed, originally designed to examine teachers' competencies and attitudes toward both digital and AI-supported teaching models.

The chosen subsection focused on the psychological effects of AI use in education and consisted of 13 questions: eight Likert-scale items (five-point scale, where 1 indicated minimal agreement and 5 maximal agreement), three multiple-choice questions, and one open-ended question allowing respondents to provide their own answers. Data were processed both qualitatively and quantitatively using descriptive statistical measures such as frequencies and percentages. Results were presented in text and through tables to enhance clarity. Based on the research objectives and the theoretical framework, the present study tested three hypotheses:

H1: Teachers primarily associate artificial intelligence (AI) with educational technology.

H2: Teachers use AI tools mainly for lesson preparation.

H3: Teachers perceive higher competence and confidence when using AI tools, reflecting psychological effects such as motivation, workload, and well-being.

These hypotheses were selected as representative of the study's focus on teachers' perceptions, practical integration of AI, and the psychological dimensions of AI use in education.

3.1. RESEARCH RESULTS

The results of the study are presented below through the testing of three representative hypotheses selected as the most relevant to the research objectives. The analysis is based on data collected from 80 teachers in the first trimester of 2026, encompassing diverse teaching areas and contexts. The hypotheses address three key aspects of AI integration in education: teachers' perceptions of AI, the purposes for its use in teaching practice, and the psychological effects associated with AI-related competencies.

H1. Association between AI and educational technology

The first hypothesis assumed that most teachers associate artificial intelligence (AI) with the use of technology in education. This was confirmed: over 70% of respondents reported that AI was among their first associations when thinking about educational technology. Specifically, 31% identified AI as their primary association, while 41% placed AI alongside other technologies at the top of their list. These findings demonstrate that AI is strongly embedded in teachers' conceptualization of educational technology. Namely, the association between AI and educational tools suggests that the teachers viewed AI mainly as part of existing digital tools rather than as a new pedagogical innovation, which may narrow their understanding of AI's wider possibilities in education.

H2. Purpose of AI use in teaching practices

The second hypothesis assumed that teachers primarily use AI tools for lesson preparation. This was confirmed: 54% of respondents reported using AI mainly for preparing lessons. About one quarter indicated that they use AI equally for preparation and during lessons, while a smaller group of teachers reported never using AI (13.2%), whereas an even smaller proportion indicated using it only during lessons (7.9%). These results show that teachers currently view AI as a supportive tool for planning and preparation rather than as a tool in classroom activities. This suggests that AI integration is still in its early stages and that teachers may require greater confidence, targeted training, and institutional support to expand its use beyond preparatory functions.

H3. AI use and teacher competencies (psychological effects)

The third hypothesis proposed that teachers perceive higher competence and confidence when using AI tools. The results largely confirm this assumption: about half of the respondents reported that AI use enhances their professional confidence, and more than half agreed that it improves the quality of education, with 40% partially and 13.8% fully confirming this view. Only a small proportion expressed negative attitudes (11.3% regarding confidence and 15% regarding education quality). Teachers also emphasized practical benefits, noting that AI tools save time in lesson planning and evaluation and facilitate the adaptation of content to different student levels. Furthermore, 55% believed that AI increases innovation in teaching, although 26.3% remained undecided, reflecting limited experience and the need for further development.

Table 1. Association Between AI and Educational Technologies

Association	Teachers
AI as primary association	31%
AI alongside other technologies	41%
Other associations	28%

Table 2. Purpose of AI Use in Teaching

Association	Teachers
Mainly for lesson preparation.	53,9%
During the lesson.	7,9%
Equally, in preparation and during lessons.	25%
Do not use AI tools.	13,2%

Overall, these findings highlight the psychological effects of AI integration: reduced workload and stress, enhanced motivation and confidence, but also ambivalence among less experienced teachers. The psychological aspect demonstrates that competence and confidence are closely tied to motivation and well-being, while uncertainty emphasizes the importance of regular, targeted teacher training and supportive institutional environments to encourage digital skills and a pedagogical background for AI integration.

To illustrate the described perceptions more clearly, the following table presents the selected aspects and the distribution of teachers' associations with AI and educational technologies:

Teachers mainly connect AI with educational technology, either as their primary association or closely linked with other tools. At the same time, a notable group does not make this association at all, or still prioritizes other associations, showing that while AI is central for many, it is not yet generally included in teachers' perceptions of technology in education. Related to these perceptions, the following table illustrates the purposes teachers use AI tools in their teaching practice:

According to the results, teachers primarily use AI tools for lesson preparation, while far fewer apply them during the class. The notable number of teachers who do not use AI at all (13.2%) highlights both the uneven adoption of AI in teaching practice and the need for further training and support. Taken together, these findings illustrate both the current patterns of AI use and the challenges of uneven adoption, providing a basis for deeper reflection in the discussion of how teachers perceive AI, the purposes for which they apply it, and the psychological effects of its integration.

4. DISCUSSION

The results of this research confirm that teachers strongly associate AI with educational technology, primarily use it for lesson preparation, and perceive positive psychological effects such as reduced workload and increased innovation. At the same time, uneven adoption and limited classroom application highlight that AI integration remains in an early stage. Our findings align with recent research [10] on 141 university teachers in Serbia, which reported strong digital competencies but limited AI use, disciplinary differences, and ambivalent views on AI's future role. The study also highlights broad disciplinary contrasts and concerns about risks such as plagiarism and diminished critical thinking. Taken together, both studies provide complementary insights into how Serbian educators perceive and experience AI in teaching, underscoring both opportunities for innovation and the need for supportive environments to address risks and ambivalence.

The predominance of AI use in lesson preparation, rather than during lessons, aligns with reports [2] that teachers often adopt digital tools first for planning and administrative tasks. This suggests that AI is currently perceived as a supportive instrument rather than a pedagogical partner in real-time classroom interaction. The uneven adoption, with a notable share of teachers not using AI at all, points to structural barriers such as training, confidence, and institutional support. Teachers' reports of increased confidence, reduced workload, and augmented innovation confirm the psychological impact of AI integration. The ambivalence expressed by undecided respondents underscores the transitional nature of AI adoption: while many teachers experience empowerment, others remain uncertain due to limited exposure or lack of training. This duality reflects the broader discourse on digital pedagogy, where AI is seen as both an opportunity for professional growth and a challenge that requires ethical, pedagogical, and psychological support. Taken together, the results show that AI is not only reshaping teachers' technical practices but also their professional identity and psychological well-being. At the same time, uneven adoption and ambivalence highlight the need for systemic support, continuous training, and ethical guidance. In the broader context, these findings contribute to the international conversation on AI in education: they align with the vision of AI as transformative [1], illustrate emphasis on professional development and classroom integration [2], and reinforce initiatives for competence-based, well-being-oriented digital pedagogy [9]. Together, these results suggest that AI is not only reshaping teachers' technical practices but also their professional self-perception. While adoption remains uneven, the evidence points to AI as a valuable tool for both pedagogical innovation and psychological empowerment, provided that regular, competence-based teacher training and digital support are available. Teachers' ambivalent attitudes are also reflected in our earlier findings: they acknowledge the benefits of technology while continuing to rely on traditional practices [14]. AI chatbots, though useful for feedback and interaction, are regarded as complementary rather than substitutive of the teacher's role [15].

The study further confirms the socio-emotional aspect of teaching, aligning with research on its psychological effects [16], and builds on Serbian higher education studies that highlight teacher competencies, balanced technology use, and evolving roles in digital and hybrid environments [13], [14], [16].

5. CONCLUSION

This study explored teachers' perceptions of AI competencies and the psychological dimensions of AI integration in education. The research examined educators in Serbia, using a sample of 80 participants from diverse educational levels and disciplines, through a survey conducted during the first trimester of 2026. By focusing on three hypotheses and situating the analysis within recent literature and international frameworks, the research provided empirical evidence of how educators conceptualize, apply, and experience AI in their professional practice. The findings confirm that AI is strongly embedded in teachers' perceptions of educational technology, predominantly used for lesson preparation, and associated with psychological effects such as enhanced confidence, motivation, and innovation. At the same time, ambivalence and uneven adoption reveal the need for systematic professional development, ethical guidance, and institutional support to ensure that AI integration benefits all educators. Placed in a broader context, these results align with an emphasis on responsible AI integration, pedagogical transformation, a framework for competence development, and digital well-being as an applicable teaching approach for different educational contexts. They demonstrate that AI is not only a technical innovation but also a psychological and pedagogical phenomenon, influencing teachers' professional identity and classroom practice. Future research should extend these findings by examining student perspectives, conducting cross-cultural comparisons, and assessing the longitudinal effects of AI adoption on teacher well-being and pedagogical innovation. Strengthening empirical evidence will be essential for building safe, inclusive, and competence-based approaches to AI in education.

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