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Does Gender Shape AI Adoption? Evidence from Serbian Primary and Secondary School Teachers

Extended summary

This paper explores whether gender influences Serbian primary and secondary school teachers' perspectives on the adoption of artificial intelligence (AI) tools. It responds to an identified gap in the pertaining literature which focuses mostly on pupils or university context, while the issue of gender differences in teachers' perspectives on AI integration in schools is generally neglected. Previous research frequently emphasized gender inequality in terms of digital literacy, self-confidence, and attitudes towards technology, whereas the more recent studies have shown that professional experience, institutional support, and training are more important than gender. The aim of this research was to determine whether gender still represents an important factor in shaping teachers' attitudes, as well as their familiarity with AI tools and the perceived challenges of using these tools in Serbian education system.

The theoretical framework of this research is based on the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Diffusion of Innovation theory (DOI). Both theories treat gender primarily as a moderating variable, rather than a central explanatory factor. While UTAUT model identifies performance expectancy, effort expectancy, social influence, and facilitating conditions as four core drivers of technology adoption, DOI theory identifies relative advantage, compatibility, complexity, trialability, and observability as five key factors influencing the adoption of innovations. These theoretical frameworks were used to operationalize AI adop-

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tion, which was analyzed through three dimensions: attitudes and expectations, knowledge and experience, and perceived challenges and risks. Previous research on the gender-related digital gap pointed to cultural stereotypes that associate men more strongly with technology, while more recent research has increasingly shown that women are more interested in professional development in the field of AI. The Serbian education system, in which the majority of the teaching staff is female and in which gender differences have not been sufficiently studied, provides a particularly suitable framework for questioning these assumptions.

The research was conducted using the quantitative approach and data were collected via an online questionnaire from 135 teachers from urban, suburban, and rural schools in January 2025. The instrument contained 26 questions, including sociodemographic data and 18 statements on AI-related attitudes. The responses were measured using a five-level Likert scale, while factor analysis was used to pinpoint three dimensions: attitudes and expectations, knowledge and experience, and perceived risks and challenges. The reliability of the scales was confirmed by Cronbach's Alpha. Mann-Whitney U test and Spearman's rank correlation coefficient were used for statistical processing.

The results showed that there were no statistically significant differences between male and female respondents in terms of AI adoption. Both men and women expressed generally positive attitudes, moderate familiarity and confidence in using AI tools, and the awareness of potential challenges. However, minor variations were identified: the women were more likely to support the usefulness of AI and expressed somewhat greater familiarity with it, while the men who stressed the challenges did so more strongly. These differences, however, did not reach statistical significance. Digital literacy, resources, institutional support, and opportunities for professional development appeared to be decisive factors. These findings are consistent with recent international research showing that perceived practical benefits and teaching experience reduce previous gender differences.

The pedagogical implications of this research suggest that programs for integrating AI into teaching should not be gender-oriented, but rather should focus on creating systemic conditions to support teachers. Given that both men and women are motivated to implement AI in teaching when they recognize its clear educational value, training should focus on practical classroom applications, gaining experience, and mitigating risks such as data misuse or students' overreliance on technology. Particular attention should be paid to ensuring equal access for urban and rural schools, as infrastructural differences may be more important than demographic factors.

Bearing in mind that this is a pilot study with a relatively limited sample, the obtained results should be interpreted with caution. Nevertheless, the findings contribute to the international debate on AI in education, showing that in the Serbian context, gender is not a barrier to adoption. Instead, the importance of experience, training, and institutional support for teachers is emphasized. Future research with larger and more diverse samples, regional comparisons, and a combination of quantitative and qualitative methods could further shed light on the dynamics of AI adoption in schools. Such data will be crucial for creating policies and practices that will enable AI to be implemented in education effectively, inclusively, and sustainably.

Keywords: AI tools, gender differences, teachers' attitudes, primary and secondary schools, AI adoption in Serbian education

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