Vol 8, No 1 (2025): Stadium –Hungarian Journal of Sport Sciences
https://doi.org/10.36439/shjs/2025/1/15836

THE ROLE OF ARTIFICIAL INTELLIGENCE (AI) IN SUPPORTING THE PERSONALIZED DEVELOPMENT OF STUDENTS AND THE POSSIBILITIES OF ITS APPLICATION IN EDUCATION

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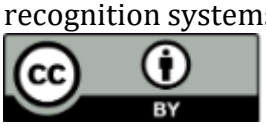
Abstract

Artificial Intelligence (AI)-based systems are constantly expanding, so it is not surprising that it has now reached the field of education. From the teachers' perspective, they saw potential in supporting teaching, while from the students' perspective, they saw potential in helping learning. In our research, we tested two hypotheses. First, how important do the teachers surveyed consider the role of artificial intelligence (AI) in supporting the personalized development of students, and how much potential do they see in the application of AI in education? We used a questionnaire method in the research. Three hundred seventy-four teachers participated in the study (N=374). 67.37 percent of the sample were PE (Physical Education) teachers, and 32.62 percent were SEN (Special Educational Needs) teachers. The results showed that special education teachers generally consider AI more essential than physical education teachers and support personalized development and practical and theoretical curricula. The differences are statistically significant, supported by low p-values (<0.05) and high t-values. The results may indicate that SEN teachers are more aware of the possibilities of using AI in education, especially in adapting it to students' individual needs. In contrast, physical education teachers are less optimistic and homogeneous in this regard.

Keywords: *artificial intelligence, education, physical education, special needs educator and therapist, innovation*

INTRODUCTION

The roots of Artificial Intelligence (AI) go back a long way. Experts disagree on when the birth of AI can be counted (GRAMMARLY, 2025). Some people associate the appearance of AI with science fiction writings, so they put it in the early 1940s since it was here that people began to deal with robotics issues. Most researchers agree that the publication of Turing's paper in 1950 was the beginning of the history of AI (ESZTERI, 2015; BUDA, 2024). The term itself, however, has been used since 1956, i.e., Artificial Intelligence (AI). According to the European Commission's definition of AI, "Artificial intelligence refers to systems that exhibit intelligent behavior, analyze their environment, and take actions with a certain degree of autonomy to achieve specific goals. Systems based on artificial intelligence can be exclusively software-based systems that operate in the virtual world (e.g., voice assistants, image analysis software, search engines, voice, and facial recognition systems), or artificial intelligence can be embedded in hardware devices (e.g.,



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advanced robots, autonomous vehicles, drones and applications related to the Internet of Things)" (EUROPEAN COMMISSION 2018: 2). In our country, the concept of AI appears in the Hungarian Artificial Intelligence Strategy as follows: "a set of algorithmic systems capable of learning and improving themselves based on input data" (HUNGARY ARTIFICIAL INTELLIGENCE STRATEGY 2020: 6).

The field of application of AI-based systems is constantly expanding, so it is not surprising that by the 1970s, it had reached the field of education. From the teachers' perspective, it was seen as a potential to support teaching, while from the students' perspective, it was seen as potential to help them learn. Researchers consider the applicability of AI in education in several areas. It can help with teachers' administrative tasks, making their work easier. It can support the precise tracking of students' progress and help with teacher feedback, assessment, and grading. It can also help with individual, differentiated instruction for students and the personalization of materials. Other options include distance learning, virtual teachers, adaptive learning, and augmented and virtual reality, but it can also help prevent dropouts (MURPHY, 2019; YUFEIA et al., 2020; ÁBRAHÁM, 2021). Despite the many possibilities, AI is still being used very slowly in education, mainly because "several areas of the educational applicability of artificial intelligence are speculative and not supported by solid evidence," says Buda (2024).

There has been much research on the applicability of artificial intelligence in the field of education (Ady – Terpecz, 2018; Horváth, 2023; Demeter - Mező, 2023), but in contrast, there are very few publications in the field of physical education. In their study, Hyun and Junga (2021) state that using technology, including artificial intelligence, enriches educational content and changes the perception of education and traditional educational models. In their study, they look for the application of AI in physical education. They see the future supporting possibilities of AI in the measurement of physical activity, performance assessment, and adaptive learning, i.e., in the personalization of physical education. Szabóné (2023) mentions in one of his studies regarding the use of AI in schools that "certain subject restrictions also appear, such as in the fields of arts and physical education." While it can be applied in many sports areas (Góczán et al., 2024), researchers see fewer opportunities for it in physical education.

METHOD OF THE RESEARCH

The research investigated the opinions of professionals working with children and the application possibilities of artificial intelligence (AI) in physical education. We aimed to examine how important the surveyed teachers consider the role of artificial intelligence (AI) in supporting the personalized development of students and how much potential they see in the application of AI in education. We used a questionnaire method to answer the research questions. The questionnaire included open and closed questions and Likert-scale questions, in which the respondents had to determine on an attitude scale from 1 to 10 how much they agreed with the statements. We worked with access sampling. We used

the SPSS-27 program to evaluate the results. Three hundred seventy-four teachers participated in the study. The sample (N=374) was 32.62 percent Special Needs Educators and Therapists (we will refer to them as SEN [*Special Educational Needs*] teachers from now on.) and 67.37% PE (Physical Education) teachers.

RESULTS

THE ROLE OF ARTIFICIAL INTELLIGENCE (AI) IN SUPPORTING THE PERSONALIZED DEVELOPMENT OF STUDENTS

The results of the aggregate sample of SEN and PE teachers are shown in Figure 1, which illustrates how important they consider the role of artificial intelligence (AI) in supporting the personalized development of students. This was measured using a Likert scale of 1 to 10 (where 1 = not at all and 10 = completely). Based on the aggregated data analysis, most respondents may consider AI's role moderately important, which reflects the median value.

The mean value (4.55) indicates that respondents generally have a favorable opinion of the importance of AI, but not everyone considers it extremely important (Grammarly, 2025). The standard deviation of the data (1.478) indicates moderate variations, suggesting that respondents' opinions are relatively homogeneous (GRAMMARLY, 2025). The black line in the graph models a normal distribution, which confirms that most of the answers are concentrated around the mean (GRAMMARLY, 2025).

Based on the distribution of responses, most people chose the value "4", which indicates that a significant portion of respondents consider the role of AI to be moderately important. Extreme values - such as "0" or "10" - appeared negligible, indicating that extreme opinions are less common among respondents (GRAMMARLY, 2025).

Since the data includes responses from SEN and PE teachers, the differences in opinion between the two groups may be balanced. However, previous statistical analyses have shown that special education teachers gave significantly higher average values, while the views of physical education teachers showed more homogeneous and lower values. This may explain the relatively moderate average of the joint sample.

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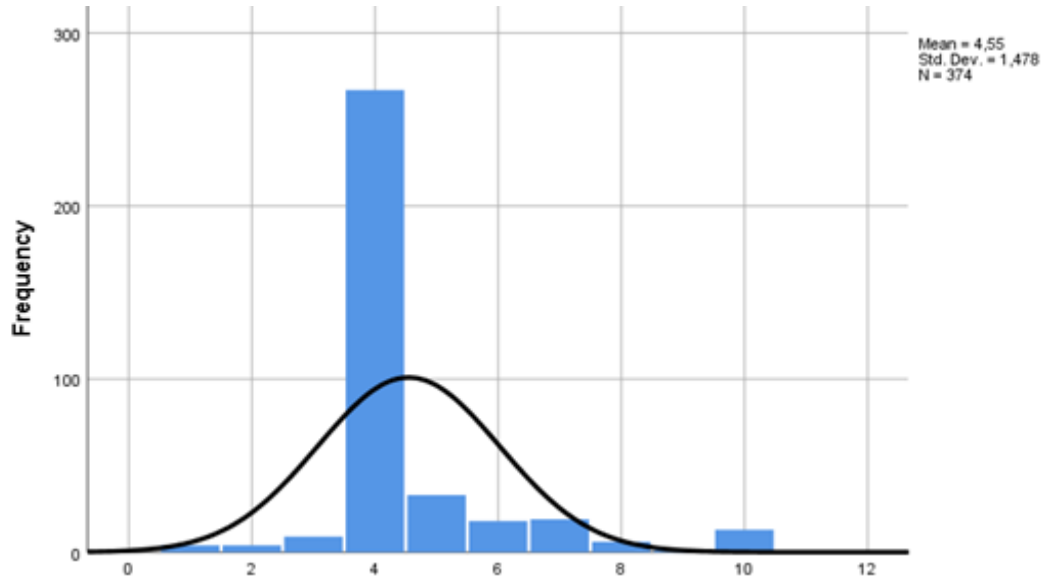

Figure 1: Perceptions of AI in ensuring personalized development of students (Likert scale values, 1= not at all, 10= entirely)

THE POTENTIAL OF USING ARTIFICIAL INTELLIGENCE (AI) IN EDUCATION

We also measured the extent to which SEN teachers and PE teachers see potential in the application of artificial intelligence (AI) in education using a Likert scale ranging from 1 to 10 (where 1 = not at all and 10 = completely) (Figure 2). Respondents rated the potential of AI as a mean of 3.28, with a standard deviation of 2.13.

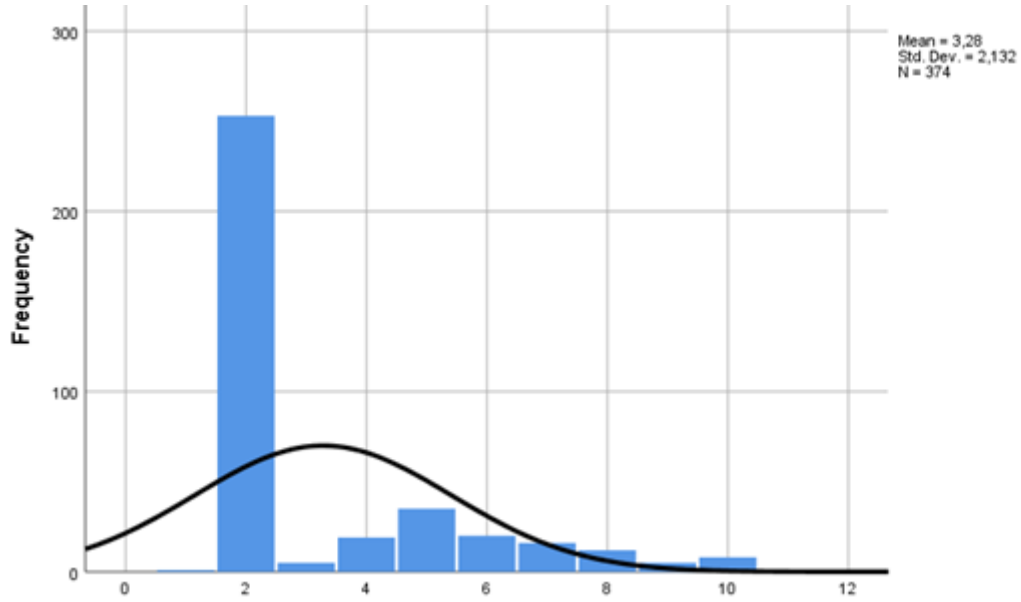

Figure 2: Perceptions of the use of AI in education (Likert scale values, 1= not at all, 10= entirely)

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The importance of AI in the personalized development of students was generally rated higher by respondents (mean: 4.55) than its educational potential (mean: 3.28) (Grammarly, 2025). This indicates that respondents believe more in the specific supporting role of AI than in its general applicability in education.

Figure 2. shows that respondents generally have lower expectations regarding the educational potential of AI. While some respondents are more optimistic, the majority are more skeptical. This may be due to the more homogeneous and lower assessments of physical education teachers. In contrast, the more favorable opinion of SEN teachers increased the mean and standard deviation. The results suggest that greater information campaigns and training in the educational application of AI would be needed to make professionals recognize its possibilities and benefits.

The two examined questions are illustrated in the sample of SEN teachers and PE teachers. In addition to basic statistics, we compared the two samples with an independent t-test, the results of which are illustrated in Table 1.

Table 1: Development of the perception of AI in the light of the responses of SEN teachers and PE teachers

Question	Respondent	N	Mean	standard deviation data	t	p
How important is AI in helping students develop in a personalized way?	SEN teachers	122	5,67	2,199	12,091	,000***
	PE teachers	252	4,00	,000		
How much potential do you see in the application of AI in education?	SEN teachers	122	5,90	1,917	32,140	,000***
	PE teachers	252	2,01	,126		

*$p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$*

The table presents a statistical analysis comparing SEN and PE teachers' opinions on the role of artificial intelligence (AI) in education. The data examines respondents' views along two questions, with the results analyzed using mean, standard deviation, t-value, and p-value indicators.

The first question examined how important they consider AI's role in supporting students' personalized development. SEN teachers gave this question a higher score on average (5.67) than PE teachers (4.00). The responses of SEN teachers were more varied, as shown by the standard deviation of 2.199. In contrast, the reactions of PE teachers were completely homogeneous (standard deviation: 0.000). Based on the statistical analysis, there is a significant difference between the two groups (t=12.091; p=0.000), which indicates that SEN teachers consider the role of AI in the development of students to be significantly more critical.

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The second question asked how much potential they see in the application of AI in education. Again, SEN teachers rated this opportunity higher, with an average score of 5.90, compared to a mean score of 2.01 for PE teachers. The standard deviation of the responses among SEN teachers was also higher (1.917), while the opinions of PE teachers differed less (standard deviation: 0.126). According to the statistical analysis, the difference between the two groups is significant (t=32.140; p=0.000).

CONCLUSION

Most respondents consider AI's role in students' personalized development necessary, but the opinions do not show a significant polarization. The data may reflect a more positive attitude of SEN teachers, while the responses of PE teachers may pull the average down. This may indicate that the acceptance of the educational application of AI depends mainly on the professional background and experience of the respondents (GRAMMARLY, 2025).

Overall, SEN has a much more positive view of the role and potential of AI in education than PE teachers. This difference is reflected in opinions supporting personalized development and its application in education (GRAMMARLY, 2025). Based on the results, SEN teachers are more aware of AI's educational benefits, especially in adapting to students' needs (Grammarly, 2025). In contrast, PE teachers are less open, and their opinions are more homogeneous (GRAMMARLY, 2025).

In conclusion, SEN teachers generally consider introducing AI in education more critical (GRAMMARLY, 2025). They would support it in more areas than PE teachers, supporting personalized development and practical and theoretical curricula.

The differences are statistically significant, supported by low p-values (<0.05) and high t-values.

The results may indicate that SEN teachers are more aware of the possibilities of using AI in education, especially in adapting it to students' individual needs. In contrast, PE teachers have a less positive and homogeneous opinion (GRAMMARLY, 2025).

The research findings show that AI significantly impacts students' lives in education, primarily through everyday tools such as language processing systems and chatbots. The high participation of SEN teachers suggests that these fields may be particularly receptive to AI-based solutions (GRAMMARLY, 2025). However, actual usage rates show that there is still room for integrating and practically applying AI tools in education.

The research also highlights that the availability and familiarity of AI tools are high but that further training and practical support for teachers are needed for their conscious, widespread use. This may be particularly important in fields such as special education, where AI tools can also play a role in meeting special educational needs.

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