

# Enhancing Educational Outcomes by Boosting Artificial Intelligence Application in Personalized Learning

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*“The real question is, when will we draft an artificial intelligence bill of rights? What will that consist of? And who will get to decide that?”*

*–Gray Scott*

AS THE social expectation of the standards of talent training increases, the society has become more aware of the limitations of the traditional one-size-fits-all education paradigm and has endeavored to develop educational paths that can better cater for individually different needs of the learner. Personalized learning, as an important instructional strategy in the new era, is intended to make education more pertinent to the unique needs, learning style, and ability of each individual student for the purpose of optimizing their educational outcomes (Kaswan et al., 2024). The rise of artificial intelligence (AI) makes changes to conventional education patterns and improvements in personalized learning possible as this technology can be harnessed to provide tailored learning materials to students, improve their information acquisition and retention, and thereby enhance their learning efficiency and educational experience (Chen et al., 2020).

Currently, a wide variety of AI-based educational technology applications have been introduced into personalized learning, such as the intelligent tutoring robot, adaptive learning system, learning path recommendation system, and more. These applications integrate machine learning algorithms, natural language processing, big data analytics, and other technologies to gather and analyze information to support individualized learning of the student. For instance, the intelligent tutoring robot is equipped with multiple AI technologies, such as speech recognition technology and emotion recognition technology (for analyzing facial expressions and intonation) (Yang & Zhang, 2019) and can serve as a virtual teacher or learning companion by providing the learner with an immersive learning

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experience. It also helps develop their social skills while heightening their interest in learning (Pataranutaporn et al., 2021). The adaptive learning system aids the student in seeking out the optimal learning path by tracking and break down data of their learning behavior (Cui et al., 2018), which substantially improves the efficiency and effectiveness of their learning processes and enhances their academic achievements (Van Der Vorst & Jelcic, 2019).

While AI technology offers huge potential for personalized learning, it also brings about challenges, such as the ethical concerns for data privacy, latent biases in AI algorithms, and difficulties in integrating AI into the established educational infrastructure. Issues like these warrant more cautious and informed solutions to the application of AI in personalized learning (Zawacki-Richter et al., 2019). Furthermore, successful application of AI-based educational technology necessitates advanced digital facilities, effective data extraction methods, and increased teacher digital literacy training (Kaswan et al., 2024).

The significance of AI technology for personalized learning has been generally acknowledged in the education world. A plurality of empirical research findings has corroborated the effectiveness of AI applications in personalized learning. A meta-analysis of existing quantitative research is highly necessary for a systematic evaluation of practical outcomes of AI-assisted personalized learning. *The Effect of Artificial Intelligence-Assisted Personalized Learning on Student Learning Outcomes: A Meta-Analysis Based on 31 Empirical Research Papers* in this issue synthesizes the research results of 36 experimental and quasi-experimental studies in this area, using meta-analytical techniques. The results of the meta-analysis reveal that AI-assisted personalized learning has a moderately positive effect on student learning outcomes (Hu, 2024). It is hoped that this study can spark further explorations of effective application of AI in individualized education as well as the avoidance of its potential risks.

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**Conflict of Interests:** None

**Doi:** 10.15354/sief.24.co346