

Artificial Intelligence-Mediated Immersive Learning Activity and Its Impact on Students' Self-Efficacy in Higher Education

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Abstract

This study investigates the impact of an immersive learning activity mediated by artificial intelligence (AI) on physiotherapy and occupational therapy undergraduate students' self-efficacy. The research aimed to determine whether this interactive methodology influenced students' confidence. The study involved 50 undergraduate students (mean age: 19 years) enrolled in the Kinesiology and Biomechanics course during the third of ten semesters. Of these students, 50% entered higher education through affirmative action policies. The students were organized into ten groups, each interacting with a customized GPT-based AI, with most using a free version. Their engagement was guided by five pre-defined prompting questions designed to explore the evolution of human movement knowledge. They participated in historical inquiry using AI-generated personas, selected or generated visual representations, and constructed a collaborative digital timeline using Padlet. Pre- and post-intervention self-efficacy levels were assessed using the modified Higher Education Self-Efficacy Scale (AEFS) (Caires & Polydoro, 2011), which contains 20 questions across five dimensions: Academic Self-Efficacy (capacity to learn and apply knowledge), Higher Education Regulation Self-Efficacy (capacity to self-regulate one's actions), Social Interaction Self-Efficacy (capacity to build relationships with colleagues and professors), Proactive Self-Efficacy (capacity to enjoy and promote educational opportunities), and Academic Management Self-Efficacy (capacity to get involved and meet deadlines). Students responded using a six-point Likert scale (1 – "Not confident at all" to 6 – "Completely confident"), with total scores ranging from 20 to 120 points. Pre- and post-intervention scores averaged 94 and 100.1, respectively ($p > 0.01$), with an overall mean increase of 0.3 per item. Data analysis revealed that three items from the Academic Self-Efficacy dimension showed the highest increase in self-efficacy perception: Q2 (Demonstrating what I learned during assessments), Q6 (Applying knowledge learned in the course to practical situations), and Q20 (Preparing for evaluations), with an average score increase of 0.6–0.7. Additionally, Q9 (Taking decisions related to my education) from the Higher Education Regulation Self-Efficacy dimension increased by an average of 0.6 points. Most items in the Social Interaction Self-Efficacy dimension showed no significant change, except for Q16 (Asking questions when in doubt), which increased by 0.7 points. These findings suggest that AI-mediated immersive learning can enhance students' self-efficacy, particularly in their beliefs regarding their capacity to learn and apply knowledge. However, its impact on collaborative learning appears limited, likely due to students' pre-existing confidence in teamwork. Future research should explore whether similar activities influence actual learning outcomes.

Keywords

Self-efficacy, Higher Education, Artificial Intelligence, Immersive Learning, Pedagogical Innovation, AI-mediated Instruction