

Designing an Adaptive Learning Environment Based on Predictive Models and Its Impact on Enhancing Multitask Learning, Digital Competence, and Academic Achievement Among Professional Bachelor's Students

The study aimed to investigate the effectiveness of designing an adaptive learning environment based on predictive models and its impact on enhancing multitask learning, digital competence, and academic achievement among professional bachelor's students in the Digital Educational Technology program. The main sample consisted of 100 male and female third-level students (fifth semester) enrolled in the course "Special Needs Care" within the professional bachelor's program in Digital Educational Technology, a joint program between the Center for Blended Learning at Fayoum University and the Faculty of Specific Education at Minia University for the academic year 2023/2024. Participants were randomly selected and distributed. To achieve the study's objectives, the researchers designed an adaptive e-learning environment based on predictive models aimed at enhancing multitask learning, digital competence, and academic achievement. The design adhered to pedagogical and technical standards for developing adaptive learning environments and predictive models. Measurement tools were developed and validated for reliability and validity, including: a cognitive achievement test for selected topics from the "Special Needs Care" course (General Concepts – Intellectual Disability), a digital competence scale, and an academic achievement scale. The results confirmed that the adaptive learning environment based on predictive models had a significant impact on improving multitask learning, digital competence, and academic achievement among the students in the study sample. Based on these findings, the study offers several recommendations and proposals, including expanding research efforts related to predictive models and their applications in learning processes, exploring various types of predictive models, integrating them with modern technologies, and examining their

role in developing diverse learning skills and improving learning outcomes.