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IMPACT OF AI-DRIVEN TOOLS AND PERSONALIZED LEARNING PLATFORMS ON SCIENCE EDUCATION IN HIGHER EDUCATION INSTITUTIONS

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This study investigated the impact of AI-driven tools and personalized learning platforms on science education within higher education institutions. The study was conducted at the Faculties of Science in two state universities. The sample included 98 students and 11 lecturers. A mixed-methods approach and a longitudinal design were employed to capture changes and trends over an academic year. The sample was selected through a stratified random sampling method. Data collection methods included surveys, standardized test scores, classroom observations, and interviews. Quantitative data were analysed using SPSS and Excel, while qualitative data were examined through thematic analysis. The preliminary findings of the study showed that academic performance was significantly enhanced by AI-driven tools, with 74 out of 98 students (75.5%) benefiting from personalized and adaptive learning experiences and 8 out of 11 lecturers (72.7%) reporting improvements in administrative efficiency and instructional support due to AI integration. Performance was reported to improve through personalized and adaptive learning experiences, which addressed individual student needs and fostered critical thinking and problem-solving skills. Students demonstrated increased engagement and motivation, which were attributed to interactive and autonomous learning environments. Enhanced digital literacy was another notable outcome. For lecturers, administrative tasks were streamlined by AI tools, particularly through automated grading and data management, allowing them to focus more on instructional activities. Personalized instructional support based on data-driven insights helped resources be allocated effectively, and teaching strategies be tailored. The continuous learning opportunities and feedback available through AI-driven professional development tools enhanced teaching methodologies and classroom effectiveness. The challenges identified during the study included technical implementation hurdles, the need for adequate lecturer training, and potential equity concerns due to access disparities. Data privacy and algorithmic biases were also critical issues that needed to be addressed to ensure the fair and secure use of AI in education. The outcomes concluded that the integration of AI-driven tools and personalized learning platforms is promising in improving educational outcomes and lecturer efficiency at higher education institutions.

Keywords: AI-driven tools, Digital literacy, Lecturer efficiency, Personalized learning platforms, Science education