

LEARNING MANAGEMENT SYSTEM USE, AI-ENABLED INSTRUCTIONAL TOOLS, AND DIGITAL INFRASTRUCTURE QUALITY ON STUDENT LEARNING OUTCOMES IN HIGHER EDUCATION

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Abstract

This study examined the predictive relationships among Learning Management System (LMS) usage, artificial intelligence (AI)-enabled instructional tools, digital infrastructure quality, and student learning outcomes in higher education institutions in the South-South geopolitical zone of Nigeria. A descriptive correlational research design was adopted for the study. The population consisted of 23,810 undergraduate students from eight federal universities, while a sample of 1,384 students was selected using multi-stage sampling techniques. Data were collected using a structured questionnaire titled Learning Management System Use, AI-Enabled Instructional Tools, Digital Infrastructure Quality and Student Learning Outcomes Questionnaire (LAID-SLOQ). The instrument had a reliability coefficient of 0.79 determined using Cronbach's Alpha. Data were analyzed using mean, standard deviation, simple regression, and multiple regression analysis at a 0.05 level of significance. The findings revealed that LMS usage, AI-enabled instructional tools, and digital infrastructure quality each significantly predicted student learning outcomes. The results further showed that the three variables jointly made a significant contribution to student learning outcomes, with AI-enabled instructional tools making the strongest individual contribution. The study concluded that effective technology integration supported by adequate digital infrastructure significantly improves student learning outcomes in higher education. It was recommended that universities strengthen digital infrastructure, promote effective LMS integration, and support the adoption of AI-enabled instructional tools in teaching and learning.

Keywords

learning management system, ai-enabled instructional tools, digital infrastructure quality, student learning outcomes, higher education, south-south Nigeria