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The Role of a Digitised Learning System on Delivering Quality Education for Sustainable Development:
An Analysis of Artificial Intelligence

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ABSTRACT

The study aims at investigating the role of a digitised learning system on delivering quality education for sustainable development, focusing on AI expressions on e-learning processes. The study deploys a quantitative design method, with a questionnaire survey given to a sample of 1st, 2nd, 3rd, 4rd and 5th year student at the University of Johannesburg to assess their interaction with the e-learning interfaces of Blackboard. The study indicates digitised learning systems are making demands for institutional support to be paramount for the success of e-learning, and enhance student motivation, and repelling fears of digital systems adoption.

KEYWORDS

Artificial Intelligence, Digital Learning, Quality Education, SDG

INTRODUCTION

Achieving quality education as a trajectory to sustainable development has received significant attention across the world. Development practitioners and scholars recognize quality education as an integral aspect of the sustainable development goal (SDGs), a set of 17 goals established by the United Nations in 2015. The fourth SDG emphasizes the value of quality education, urging all nations to prioritize education as a means to achieve goals of sustainable development.

Didham and Ofei-Manu (2015) presented that quality education boosts economic growth and development, serving as a crucial tool for enhancing human development. Moreover, quality education is linked with poverty reduction. Lochner (2010) argued that it improves health and well-being, encouraging peace and security, and reducing hunger. Additionally, it contributes to disease prevention and social equity, while heavily influencing health outcomes, financial income, and employment opportunities (Lochner, 2010).

The World Bank has shown that increased secondary school enrollment rates reduce the risk of civil wars and social crimes (Collier & Sambanis, 2005). Additionally, quality education enhances agricultural productivity, contributing to hunger reduction (International Food Policy Research Institute, 2005).

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There have been calls to adopt digital technologies in education systems in most developed countries. To inspire students, learning environments have integrated digital technologies like artificial intelligence (AI) into their curriculum. Thus, AI technologies have transformed the education sector, establishing virtual learning, enhancing student engagement, and promoting positive learning outcomes (Fokides & Kefallinou, 2020; Heindl & Nader, 2018).

The integration of AI in education enables the personalization and individualization of learning, which transforms how students learn (Rana et al., 2022). According to Samad et al. (2022), AI-powered digitized learning systems promote teaching styles that tailor learning experiences to each student's learning level, motivation to study, and pace (Zarei et al., 2022). Furthermore, AI can automate the grading and assessment process, giving students immediate feedback while saving instructors time and effort (AlAli et al., 2023).

This article aims to assess the role of digitized learning systems in delivering quality education for sustainable development through AI. It explores ways in which AI-powered personalized learning impacts student motivation and engagement within such systems. The article begins with an introduction, describing the research methodology used to collect data and the strategies used for data analysis and interpretation. Then, it outlines the study's conceptual structure and theoretical framework. This is followed by a literature review, exploring factors that promote sustainable development and the ways AI supports quality education. The discussion highlights how AI enhances or challenges traditional learning systems, alongside recent studies on AI's role in education. The fifth section consists of findings of the study, while the sixth section addresses study limitations and future research. The article concludes with a summary of key insights and final remarks.

RESEARCH METHODOLOGY

This study employs a quantitative method, justified by its methodological rigor, its ability to test hypotheses, and its capacity to provide a framework for comprehending correlations between variables through statistical approaches. Its use of power analysis determines sample size, ensuring sufficient data collection to identify meaningful effects. While qualitative methods offer valuable insights, they do not provide the statistical capacity to draw generalizations about populations. Mixed-methods research, though capable of providing a full perspective by integrating qualitative ideas, was not considered for the study due to the complications it introduces, particularly in data integration and methodological rigor.

Surveys were used in this study to gather data, considering the characteristics of the target population. The data analysis was conducted using the Statistical Package for the Social Sciences, employing descriptive statistics to present data in an understandable manner. Descriptive statistics were used to communicate attributes the fundamental aspects of the data, including measures of central tendency, without resorting to intricate inferential analyses.

A sample representing 30% of the population was collected based on enrollment rates. The decision was based on the need for representative sampling and statistical power analysis, ensuring that the sample size was both reasonable and statistically sound. By selecting an appropriate sample size, the study guarantees that its conclusions are solid and generalizable to a larger population.

The study adhered to the University of Johannesburg's ethical standards, ensuring participants were given information on voluntary participation and made aware of their freedom to leave the study at any time. The questionnaires were accompanied by a letter of informed consent, which were signed before participants completed the questionnaire. Finally, participant confidentiality was upheld by anonymizing the responses, removing participant names, and ensuring that the completed questionnaires were not published. Only the relevant meaning units were used in the presentation of the study's data.