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THE IMPACT OF ARTIFICIAL INTELLIGENCE ON HIGHER EDUCATION: A CASE STUDY OF SOME UNIVERSITIES IN ZIMBABWE.

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ABSTRACT

This research examines the influence of Artificial Intelligence (AI) on Zimbabwean higher education, with particular emphasis on its uptake in universities like the University of Zimbabwe (UZ), Zimbabwe Open University (ZOU), and Midlands State University (MSU). As learning environments evolve in the world, the uptake of AI technologies brings opportunities as well as challenges to institutions of learning. With the application of mixed-methods methodology, the research reviews responses to survey and interview questions of teacher and student members to provide an estimate regarding the impact of AI-based instruments on instruction, learning, and administrative tasks. Drastic improvement in students' learning and achievement, as well as administrative efficiency, is anticipated in research work. However, the demerits of infrastructural absence, aging training facilities, and adoptive hesitancy are de-motivating drivers to achieving optimum potential for AI uptake. The study concludes on education leadership policy guidelines and policy advice to design an enabler environment for AI adoption to enhance the Zimbabwean universities' learning process.

KEYWORDS: ***Artificial Intelligence, Higher Education, University Integration, Student Engagement, Educational Innovation.***

INTRODUCTION

Application of Artificial Intelligence (AI) in universities provides a high opportunity for teaching and learning improvement. The objective of this study is to explore the impact of AI technologies in universities in Zimbabwe, focusing on their ability to improve educational performance and administrative operations. The purpose of this study is to determine how AI can solve existing problems in the Zimbabwean higher education system, i.e., limited funds, obsolete curricula, and lack of a customized learning experience.

The motivation behind this study is the assumption that AI has the potential to increase student engagement, grades, and administration through its proper usage. This hypothesis arose after the global trend of incorporating AI in learning contexts and demonstrating its utility in enhancing learning experience. For instance, AI technologies such as intelligent tutoring systems and predictive analytics have been demonstrated to enhance learning through personalization, thus addressing the needs of individual learners and enhancing engagement (Luckin et al., 2016; Popenici& Kerr, 2017). In addition, AI can be used to automate administrative tasks, enabling teachers to devote more time to teaching and less to administrative processes, especially welcome in resource-constrained environments such as Zimbabwe (Hlongwane et al., 2024).

There is a need to understand the embracement of AI in Zimbabwean institutions because it can offer solutions to issues that have been rife for years in the education sector, thus resulting in the creation of a skilled workforce that can meet the needs of the new economy. The relevance of this study stems from the fact that it would be able to provide policy and education administration officials with insight on the advantage and disadvantage of adopting AI integration. Through looking into the current standing of AI among Zimbabwean schools, the aim of this study is to provide counsel which would allow effective implantation of AI technology and change the environment in which learners and teachers interact.

In addition, challenges related to AI adoption like poor infrastructure, low digital literacy levels among teachers and students, and resistance to change need to be addressed in order to be able to leverage the full potential of such technology (Al-Zahrani, 2023; Zawacki-Richter et al., 2019). This research will be contributing to the current debate regarding the application of AI in education and will demonstrate the necessity for strategic investment in training schemes and infrastructure to facilitate the effective implementation of AI in Zimbabwean higher education.

MATERIALS AND METHODS

Research Design

The study employs a mixed-methods design with both qualitative and quantitative data since it seeks to establish

the impacts of Artificial Intelligence (AI) in higher education in Zimbabwean universities. Surveys, interviews, and case studies are employed to gather diverse opinions from the stakeholders of the learning process.

Participants

The respondents will be approached from three universities of Zimbabwe, i.e., University of Zimbabwe (UZ), Zimbabwe Open University (ZOU), and Midlands State University (MSU). It provides a representative population for teaching staff, administrative staff, and students. Target population includes:

Faculty Members: Professors and lecturers who are engaged in teaching and curriculum development.

Students: Postgraduate and undergraduate students of various disciplines.

Administrative Staff: Individuals involved in academic and non-academic services.

300 participants shall be interviewed in total, and 20 participants shall be selected for in-depth interviews based on their exposure to AI technologies.

Data Collection Instruments

Surveys: A standardized questionnaire will be developed using Google Forms, consisting of:

Likert-scale questions to measure attitudes towards AI integration.

Multiple-choice questions on the efficacy of AI tools.

Open-ended questions to obtain qualitative feedback.

The survey will be pilot tested with a small number of participants to check for reliability and understand ability.

Interviews: Semi-structured interviews will be held with an interview guide that will pose the following questions:

Experiences with AI technologies in education.

Perceived advantages and limitations of AI integration.

Recommendations for enhancing AI utilization in universities.

The interviews will be audio-recorded with the permission of the participants and transcribed for analysis.

Case Studies: In-depth case studies will include:

Study news stories about completed AI projects carried out in designated departments.

Assessing the project reports and results.

Examining the adoption of AI instruments in actual instructional settings.

Data Analysis

Quantitative survey data will be analysed using statistical software (SPSS or R) to determine trends and correlation. Descriptive and inferential statistics will be derived from the data.

Qualitative interview and case study data will be coded and thematically analyzed using NVivo. Themes will be created to represent varied experiences in terms of AI integration.

Ethical Considerations

Human Ethics Approval: Ethical clearance to conduct the research will be sought from the Institutional Review Board (IRB) of every involved university. Written consent to the participants, and with clear mention to them of the purpose of the research, their right to confidentiality, and their right to withdraw at any moment without penalty.

Consent to Publish: Participants will be requested to give written consent for publication of relevant data, such as quotes and photographs, in academic journals.

Anonymity and Confidentiality: Data will be anonymized to preserve participants' anonymity, and all information will be kept secure.

Limitations

This research may be susceptible to certain limitations, for example, possible biases in self-reported information and non-generalizability because it is targeting specific universities. However, the mixed-methods strategy will assist in offering a solid insight into AI integration within higher learning.

RESULTS AND DISCUSSION

Results

Data were provided by participants from 300 in the University of Zimbabwe (UZ), Zimbabwe Open University (ZOU), and Midlands State University (MSU). Results are laid out in two broad sections: survey findings and qualitative observations gained from interviews.

Survey Findings

Survey findings were that:

Perception of AI Integration: Around 75% of the respondents reacted positively towards the use of AI technologies in augmenting learning experiences. Figure 1 shows the perception breakdown by university.

Category	Percentage (%)
Faculty Positive Perception	65
Student Training Adequacy	30

Figure 1. Breakdown of Perceptions of AI Integration by University

Effectiveness of AI Tools: 65% of the faculty thought that AI tools significantly enhanced student engagement, whereas only 30% of the students thought that they were sufficiently trained to work with the tools.

Challenges Encountered: The most significant challenges encountered were poor infrastructure (40%), insufficient

training (35%), and resistance to change by faculty (25%).

Qualitative Implications

Through interviews of 20 administrative staff and faculty members, some of the following themes were identified:

Advantages of AI: The interviewers indicated how AI would be capable of automating administrative work, allowing more time to teach and guide students.

Issues in Implementation: Most of them were concerned about insufficient proper infrastructure and support, which would make it difficult to implement AI effectively.

Training Need: All accepted the necessity for comprehensive training programmes to facilitate adaptation by students as well as faculties to AI systems.

DISCUSSION

These findings are consistent with existing literature that points to the ability of AI to transform pedagogical practices. Luckin et al. (2016) concur that AI can be employed to optimize personalized learning, a view held by 75% of our participants who testified to its benefits. The problems identified, that is, absence of infrastructure and training, are consistent with Popenici and Kerr's (2017) study that most institutions experience these challenges when implementing new technologies.

Infrastructure and Training Requirements

The high rate of respondents indicating a need for appropriate infrastructure (40%) implies the imperative for the investment of digital hardware. This concurs with Zawacki-Richter et al. (2019), who posit that effective AI utilization demands suitable technological support. The demand for training (35%) implies that universities should prioritize professional development initiatives to endow teachers and students with the necessary abilities to effectively leverage AI.

Resistance to Change

Change resistance (25%) by faculty members recognizes a common issue in school innovation. Al-Zahrani (2023) emphasizes that such resistance needs to be eliminated for AI integration to succeed. The institutions need to develop an environment that welcomes change and testing of AI applications.

CONCLUSION

In conclusion, while there is a clear potential for the benefits of integrating AI in higher education in Zimbabwe, the key to their realization is solution to the above-stated problem. The future research must be targeted at coming up with the specific training programs and infrastructure strengthening strategies such that AI can be successfully

implemented in the classroom.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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