

E-assessment Strategy and University Education in East Africa. An Empirical Review

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ABSTRACT

This review examines the current state of e-assessment and e-marking in East African universities, focusing on Uganda, Tanzania, and Kenya. The increasing demand for higher education in the 21st century necessitates a shift in administration and learning outcome assessment strategies. E-assessment is increasingly important in this context, offering more qualitative learning experiences. In Uganda, studies highlight the need for enhanced ICT infrastructure, accessibility, and continuous training for students and lecturers. Tanzania faces challenges such as lack of digital technology, skills, and policies, while teachers' perspectives on e-assessment highlight security concerns. Kenya's public universities lack approved policies and limited e-learning materials utilization. The review concludes that most East African universities lack the capacity to fully implement e-assessment and e-marking. Recommendations include embracing e-assessment opportunities, promoting digital literacy, strategically positioning universities as knowledge epicenters, and implementing a blended assessment approach. East African universities are urged to adopt e-assessment and align their education systems with the digital age to meet 21st-century expectations and requirements effectively.

KEYWORDS: E-assessment, Information Communication Technology, E-learning, Strategy, E-marking

INTRODUCTION

In the 21st century the demand for higher education has continuously kept growing putting a lot of pressure on the strategies that need to be embraced in the administration and assessment of learning outcome. Currently nations stand on a critical edge in the development of learning. There is dire need to align the education systems with modern technology to ensure the fundamentals of learning and assessment are maintained. E-assessment has attained a critical focus than ever before. It is therefore becoming a necessity to modernize assessment to make learning qualitative. This can be enhanced through improved assessments and qualifications hence providing the opportunity for a better future [1]. In the post corona era countries are striving to ensure that their current systems of

educations offer lasting remedies to challenges facing education. This is a sure way of making education relevant in this critical moment of high technological development. This would be a sure way of preparing learners and making them proactive in learning. Modern nations have the obligation to streamline their education systems to ensure quality assessment and marking through modern technology. Unfortunately, this process has faced several hurdles that would comfortably be solved in e-assessment. A few universities have used digital platforms to provide both formative and summative assessments. The outcome has been effective and safe. However, this has not been uniformly done by all universities globally. Universities are now challenged

to offer assessment digitally being the epicenters of knowledge and training [2]. There is now a paradigm shift from the use of paper-pen examinations to e-assessments. This would make learning flexible hence enable learners to pursue and access university education at their own pace. Research has shown that assessing learners using traditional analogue modes is both time consuming, strenuous and risk in all nations across the globe [3, 4]. Most learning institutions that use paper-pen examinations are faced with multiple malpractices in the course of examinations. The cost of producing examinations, the logistics involved in examination administration as well as insecurity of the same is enormous. The

solution to this menace is e-assessment. Research and practice show that online testing can assess questions of any nature. However, this would only work if the students have the necessary prerequisite digital knowledge, skills and experience [5]. The adoption of e-assessment strategy still remains a pipedream in most universities in East Africa especially in conducting summative assessments despite the cost effectiveness, efficiency and security of this strategy. The need to integrate technology within assessment is urgently wanting. It is against this background that this review explores the current status of e-assessment and e-marking in universities in this region.

E-assessment in Uganda

[6] conducted a study to investigate the perception of both students and lecturers in private and public universities towards the effectiveness of e-learning. The study objectives were meant to investigate whether there exists a difference in perception towards e-learning effectiveness between students in private and public universities; to investigate whether there exists a difference in perception towards e-learning effectiveness between lecturers in private and public universities. The study followed a quantitative approach and a cross-sectional survey design. The study sample consisted of students and lecturers in the departments of the Arts and Social sciences conveniently selected based on their willingness to participate. The two-sample t-test with equal variance was used to analyze the data. The study findings revealed the existence of a significant difference in perceptions towards e-learning effectiveness between students in private and public universities ($p = 0.0000 < 0.05$), and between lecturers in private and public universities ($p = 0.0000 < 0.05$). It is concluded that the apparent differences in perception are better explained by the state of readiness to adopt e-learning by both students and lecturers in private and public universities. It is recommended that universities obtain the necessary ICT infrastructure to support e-learning, make

it easily accessible, and continuously train both students and lecturers in e-learning methodologies. It is also recommended that e-learning methodologies become an integral part of the teaching-learning methodologies in universities.

[7] conducted a study to investigate the level of readiness of students from Busitema on online learning to establish an effective online learning system. An online self-developed questionnaire was used to obtain the data. The study identified knowledge gap in handling online courses. The study recommended urgent need to continuously undertake students' online orientation through virtual training to enhance students' abilities to handle online learning and the related challenges. Unstable internet connectivity and power supply were noted to be greatest obstacles to online learning. The study also identified the cost of internet bundles and, to some extent, ICT gadgets to have had an impact on online learning. The results show that Busitema University students are at a fair level of online learning readiness, in general. A report by [8] shows that Ugandan universities reopened in January 2022 after a long closure by the government. Consequently, universities such as Uganda Christian University, Islamic University in Uganda, Ndejje University, and Kampala International University had resolved to maintain e-assessment. It is reported that Uganda

Christian University adopted first e-assessment while others followed. This was particularly on postgraduate students during the lockdowns, but cheating by students was noted to be the main concern of this system. The report recommended adequate training for lecturers to be able to set e-assessments and supervise the online well for the result to be valid and reliable.

[9] conducted a study to examine the preparedness for e-learning by Ugandan universities and proposed measures to promote the utilization and development of online systems to boost academic standards in the country. Data collection involved eight higher institutions of learning in Uganda. The findings established for e-learning to be effective there was need to create public awareness, enhance technology, and modify pedagogical techniques as well as the content to be aligned to online learning. These were prerequisite conditions to ensure successful e-assessment model. [10] reported that university colleges at Makerere University had resorted to use selected alternative modes of e-assessment that had been approved by the university council. The management had consequently advised colleges to convene consultative meetings with students and lecturers to establish appropriate modes of e-assessment. The university management had proposed open book examinations, quizzes, oral assessments and recorded videos among others. The students were thereafter instructed accordingly on the selected digital platforms of e-assessment. The platforms included MUELE-Makerere University e-Learning Environment, zoom, WhatsApp and email. However, some courses like engineering, art and design required considerable time because of the drawing digitally. Student readiness had made the time table for examinations to be lengthened. [11] conducted a study to explore the implementation of online methodology. The target population included students and lecturers at Makerere University Business School. Data was collected by use of questionnaires. The findings established that lecturers

lacked prior knowledge on online pedagogies but were able to attain pedagogical skills on e-learning after training. Most of them did not resist the adoption of e-learning on their teaching and learning activities. The lecturers expressed their readiness to embrace digital learning. However, the junior lecturers were trained in the use of e-learning tools. The study concluded that perception on the usefulness of the users had a direct effect on behavioral intention and willingness more than the perceived use of the e-learning management system. [12] carried out a study to examine the modes of assessment, that is, electronic, oral and paper and pen assessments. The study adopted a cross sectional survey design was utilized in which quantitative measures were used to establish a secure and acceptable mode of assessment. The study population was comprised of learners and instructors at Bishop Stuart University and Mbarara University of Science and Technology. From a target population of 411 a sample of 352 was selected using Krejcie and Morgan formula. Primary data was collected by use of questionnaires and eventually analyzed using descriptive statistics. The study findings established that the use of pen and paper was ranked in usage. On security of the assessment, e-assessment was ranked first, although this mode is not widely utilized due limitations on the type of examination questions it tests. The study noted that although pen and paper was the most used mode of assessment, it faces hurdles in regards to insufficient feedback, totaling the scores and bad means of keeping and maintaining examination answer sheets. The study recommends use of a variety of questions on e-assessment mode to it more popular among the students and staff of universities.

[13] conducted a study on the adoption of on-line learning in promoting continuous education in the context of lockdowns. This was necessitated in knowing whether students pursuing health courses were ready to accept online learning and assessment. As result, a technology acceptance model was used in this

research to determine predictor variables. In adopting this model, learners and information technology were selected as the variables of the study. The findings indicated a high percentage of acceptance on online learning. However, lower-level acceptance towards this model were noted from students in first year. In line to this, there were low levels towards adopting online learning based on lack of learning expectations, confidence, prior learning, flexibility in learning and high cost of internet. The study concludes that universities should enhance infrastructure and preparedness of all students towards online learning.

[14] did a study to determine the type of digital modes embraced by learning institutions in Kampala, Uganda. This study specifically sought to evaluate the security of digital devices for e-learning in conducting e-assessment. The study employed a mixed research approach in collecting and analyzing primary data. The study selected respondents based on purposive stratified random sampling for academic institutions, approved from the Ministry of Education in Uganda to offer virtual learning. A sample of four hundred was selected as the study population. The findings indicated that Zoom topped the list of e-learning platforms, for primary schools; Google Meet for secondary schools and Moodle at University level. These digital forums were entirely used for posting learning materials, and necessary in promoting the learner-facilitator interactions. However, they were not used to manage education progress to institutions of higher learning. [15] conducted a study purposely to analyze the cost implications of adopting online learning strategies in universities in Uganda. The study intended to propose policies that would solve challenges associated with this technology. The research adopted a descriptive research design to explore experiences of using e-learning in universities. Data was collected by use of a survey questionnaire from university students. Data collected was thereafter analysed by use of descriptive statistics to develop an understanding on

the use of e-learning. Inferential statistics was utilized to reveal the amount of relationship between the independent variables and the dependent variable. The study results established a significant relationship between online techniques used by universities and financial implications. It was therefore hard for students and lecturers to adopt e-learning due to lack of power, training and reduction of communication between learners and their instructors, as well as high cost of digital devices. [16] conducted research to establish determinants of e-learning among the learners in three universities in Uganda. Data was collected using semi-structured interview and questionnaires. A cross-sectional survey design was used on university students from Kyambogo, Makerere and Kampala International University. A response rate of approximately 95% was obtained. The findings showed majority of the respondents had good knowledge on e-learning. From the semi-structured interview schedules, it was found out that lack of internet connections and expertise on e-learning were hindrances to adoption of this technology. The study recommends prior adequate planning by involving the learners. The epicenters of learning should liaise with telecommunications so as to access reduced costs on connectivity as well as digital devices. [17] did a study to establish determinants of e-learning uptake in Ugandan universities. Primary data was collected through the use of questionnaires. The sample size was 380. This was composed of students, lecturers and ICT staff from Ugandan universities. The research findings indicated that adoption of e-learning was influenced by patronage, perceived usefulness, compatibility and perceived ease of use. However, observability did not have much effect on adoption of e-learning technology. The study concluded that there should be well-structured training offered to university learners, instructors and ICT support staff to acquaint them with prerequisite skills on the usage of digital platforms used in e-learning.

E-Assessment in Tanzania

[18] did a study on the applicability of e-learning in selected universities in Morogoro Region of Tanzania. Primary data collection was done by use of both interview schedules and questionnaires. A sample size of ninety respondents was chosen by use of purpose sampling and simple random sampling. Collected data was edited, coded and analyzed using descriptive statistics. The findings were presented using frequency and mean statistics. The study found out that universities did not apply online skills adequately. This was due to lack of skills, poor attitude, and inadequate ICT facilities. The study recommended allocation of funds to universities by the government to obtain infrastructural facilities. The study also recommends the teaching of ICT curriculum at primary and secondary school levels to change learners' attitudes on online learning.

[19] conducted a study on teachers' perspectives on e-assessment in Tanzania. This was a case study that focused on the Institute of Accountancy Arusha (IAA). The target population was all the tutors at IAA. From this population, a sample size of 97 respondents was selected for this research. a quantitative research approach was used. The study used a descriptive research design to seek the opinion of respondents on the research problem. Data was analyzed by use of descriptive statistics that included measures of central tendency, frequencies and percentages. This was done with the aid of SPSS version 26. The study found out that most participants were not willing to undertake e-assessment due to security issues. Based on this the study reached a conclusion that teachers required sufficient assistance, knowledge and pedagogy on e-assessment adoption. Universities therefore require management information systems with adequate facilities and power to support e-assessment. [20] conducted a study to assess the happiness of academics in universities in Tanzania during periods of massification. A sample of 116 academics was selected through google formats. The level of happiness was measured in a Likert scale of five. The degree of

happiness was measured by descriptive statistics. The null hypothesis was tested by T-Test and the Kruskal-Wallis H Test. The results indicated that the academics are generally happy, but get less happy during marking examinations and doing examinations. The study established that neither gender nor academic positions and working experiences significantly affected academic unhappiness. The study recommends universities to find out suitable assessments for their learners and utilize e-assessment technology to lower pressure associated with marking for the academics. The study urges the government of Tanzania to promote measures that would enhance e-assessment in the universities.

[21] carried out a study to assess challenges facing adoption of e-learning in the universities. The study used a qualitative research method in which lecturers, students and ICT experts were interviewed to develop insight on issues of concern linked with the adoption of e-learning technology in Tanzanian Universities. The study identified alternatives to distance learning, the potential problems associated with the adoption of these technologies and effects of utilizing e-learning on universities.

[22] conducted a study to explore the most critical impediment to the usage of online by the universities in Tanzania. This was an empirical review that surveyed eighteen literature that were relevant to this study. From the results it was evident that universities in Tanzania lacked digital technology since most students had no adequate access to lap tops, and internet connectivity. The users of e-learning did not possess sufficient competencies on online platforms. The study further found out that universities in Tanzania didn't have policy on e-learning technologies. [23] carried out a study to assess factors affecting the adoption and utilization of e-learning services by lecturers and learners in Mzumbe university in Tanzania. The research used an exploratory sequential mixed approach whereby both quantitative and qualitative methods were utilized to explore the availability and status of

online learning services; and to determine the attitudes of lecturers and learners on e-learning services respectively. The study collected data using in-depth interviews and documentary review for qualitative data while questionnaires were used to collect quantitative data. Qualitative data was analyzed by use of content analysis while descriptive was used to analyze quantitative data. The results showed that e-learning had been adopted in this university. Online examinations assessment scores as well as time tables were available. However, most of the learners had negative attitude towards e-

E-Assessment in Kenya

[24] carried out a study to critically examine the status of e-learning in public universities in Kenya. In this study data collection involved the use of self-administered questionnaires. The study population comprised both lecturers and students from seven sampled universities. Primary data was collected by use of questionnaires, interview schedules and focus group discussions. Questionnaires were self-administered. Descriptive statistics was used to analyze data collected. The findings established that e-learning was at an infant stage in Kenyan institutions of higher learning. Most of the universities did not have officially approved policies on e-learning by the university senates. E-learning was minimum used by academic staff as well as the learners. The available e-learning materials were e-notes without face-to-face contact of learners and lecturers. Additionally, Kenyan universities had not invested in ICT and the prerequisite skills. They lacked capacity building on this as well as standardized e-learning programs in the entire nation.

[25] did a study to investigate the adoption of e-learning mode of learning. The study objectively sought to establish extent in which e-learning is being utilized by students in Nairobi University, the problems they encountered as well as e-readiness factors affecting the effective use of university portal. The collection involved the use of questionnaires framed on a five-point likert scale. A sample of 100 students was chosen from the target

learning services as a result of lacking basics in computer literacy skills, insufficient facilities, costly internet as well as connectivity. There was an element of resistance to the new culture of technology impacting on adoption of digital learning. Despite this, lecturers were positive towards e-learning. This was necessitated by their appetite to learn the new technology, and the university regulations that made it compulsory. The research recommended further improvement on e-learning technology and adoption of e-learning policies.

population. Data was analyzed by the use of both descriptive and inferential statistics. The findings show most the learners were prepared for e-learning despite having not been trained on the use of the portal. The study conclusively noted the need for the university to improve ICT facilities and organize for training of students and staff on e-learning. Majority of the students were e-ready for adoption though majority have not been trained on the usage of the portal. In conclusion, infrastructure has to be improved to gather for the big population of the students and the university administration should put more emphasis and conduct more training on e-learning.

[26] conducted a study purposely to find out challenges facing adoption of e-learning in public universities in Kenya. This research was conducted between February 2012 and February 2014 to determine the challenges affecting the adoption of e-learning in these institutions of higher learning. Data were collected using questionnaires administered to 420 lecturers and 210 students, and analyzed through the use of simple descriptive statistics. Lecturers ranked heavy workloads the most serious challenge affecting the adoption of e-learning, followed by: insufficient Internet connectivity, denial of copyrights for their developed e-learning modules, limited information and communication technology (ICT) skills, lack of incentives, shortage of computers/laptops, inadequate computer laboratories, and

insufficient time for online interaction. Students, on the other hand, ranked insufficient Internet connectivity the number-one challenge, followed by: lack of computers/laptops, inadequate computer laboratories, limited ICT skills, and insufficient time for online interaction. The paper concludes that as a result of these challenges, the adoption of e-learning is slow and still at its infancy stage in public universities in Kenya. It recommends that universities should invest heavily in the improvement of e-learning infrastructure, e-learning content development, capacity building, attitude change, and enhancement of e-learning awareness. [27] conducted a study to the adoption of e-learning by faculty of Higher Education Institutions (HEIS) in Kenya using the case of Technical University of Kenya and USIU. This study's specific objectives included: to determine the factors that influence the adoption of e-learning by faculty of Higher Education Institutions in Kenya; to examine the challenges in the adoption of e-learning by faculty of Higher Education Institutions in Kenya; and to identify way of overcoming the challenges of e-learning by faculty of Higher Education Institutions in Kenya. The study utilized a descriptive research design. The target population was 330 constituting faculty members from the two aforementioned universities. A sample of 180 respondents was chosen from the target population. A stratified random sampling technique was used to select respondents proportionally. Descriptive statistics and inferential statistics were used to analyse data. Descriptive statistics was done by use of percentages and frequency distribution while inferential statistics utilized Correlation and Pearson correlation to determine the relationship between variables. The study found out that e-learning is effective in improving their teaching efficiency in their respective institutions. The study established that respondents were influenced on the use of this technology based on their online skills, positive attitude towards the use of e-learning platform, personal innovativeness and online experience. The study further established several

challenges that influence the use of this mode of study including internet connectivity, inadequate computers, students' preference to face to face interactions, and resistance to change. The privacy and security of the e-learning system was another challenging issue. The study concludes that e-learning was more embedded in the USIU learning process as compared to TUK. The study recommends creation of awareness on to the benefits of using e-learning platforms, provision adequate computers to facilitate e-learning. [28] conducted a study to identify e-assessment tools; to evaluate differences existing between the performance of assessment based on paper and pen and e-assessment; and to investigate the feasibility of implementing e-learning in Strathmore University. The study established that the university had a variety of tools to facilitate e-assessment. It was also found out that e-assessment was preferred to traditional assessment in terms of students' performance, management of large classes, flexibility and cost effectiveness.

[30] carried out a study on the challenges that have faced Kenyan public universities on implementing e-learning over decades, and the low levels of acceptance and adoption of digital learning. The study purposively intended to investigate the challenges that have hindered the implementation of e-learning. The study noted that the implementation of e-learning has encountered several hurdles hence affecting its effective adoption. The findings further established that the Covid19 pandemic has positively increase e-learning uptake in Kenyan public universities. Successful implementation of e-learning requires that numerous challenges need to be overcome when implementing e-learning in universities.

[31] carried out a study to investigate the e-learning readiness among lecturers from the university of Nairobi. It aimed to carry out a diagnostic e-learning readiness assessment and determine factors that influence e-learning. Self-administered questionnaires were used to collect data from lecturers. The study established that there is significant relationship between

the age of lecturers, gender and level of education on e-learning readiness. The study further established that technological readiness is crucial in

CONCLUSION AND RECOMMENDATIONS

East African universities face challenges in implementing e-assessment and e-marking due to a lack of readiness for the digital age. To overcome these issues, universities should embrace e-assessment, encourage digital literacy among students and lecturers, strategically position themselves as knowledge epicenters, and implement a blended assessment

Ongesa attaining e-learning readiness. The study concluded that lecturers were ready but facilities were inadequate to support this mode of learning.

approach that combines traditional and e-assessment methods. This will ensure safer, cost-effective, convenient, and timely examinations for students. By adopting these recommendations, East African universities can successfully transition into the digital age and meet 21st-century standards in their assessment and learning methods.

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