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Usability of Digital Resources and Academic Staff Performance in Early Childhood Teacher Education: A Correlational Study at Kyambogo University

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ABSTRACT

This study examined the relationship between usability of digital resources and job performance of academic staff in Early Childhood Teacher Education at Kyambogo University, Uganda. While digital technologies are increasingly recognised as transformative in higher education, limited empirical evidence exists regarding their actual usability and performance implications for early childhood teacher educators in the Ugandan context. This study provides the first correlational evidence linking digital usability to job performance in this under-researched population. Using a correlational survey design with 100 academic staff respondents , the study found a strong positive correlation between digital resource usability and staff performance ($r = 0.624$, $p < 0.001$) . Findings indicate that staff who effectively utilise word processing, spreadsheets, video conferencing, and internet resources demonstrate significantly higher performance in teaching, research supervision, and assessment. However, challenges including inadequate infrastructure, limited online instruction usage (92.0% non-use) , and absence of continuous professional development persist. The study concludes that usability of digital resources is a significant predictor of job performance among early childhood teacher educators. The paper recommends strategic investment in digital infrastructure, structured training programmes, and policy frameworks to enhance technology integration in early childhood teacher education.

Keywords: (Digital resources, usability, job performance, early childhood teacher education, Technology Acceptance Model)

INTRODUCTION

Digital technologies have transformed teaching and learning across all levels of education, shifting the educator's role from knowledge transmitter to facilitator, knowledge navigator, and co-learner (Patil, 2025). In higher education, the integration of digital resources is no longer optional but essential for effective teaching, research, and professional engagement. However, while much attention has been given to digital transformation in primary, secondary, and university education generally, early childhood teacher education particularly in sub-Saharan African contexts remains significantly under-researched. Yet, it is within this specialised field that future teachers of young learners are prepared, making the digi-

tal competence of academic staff a critical but often overlooked determinant of quality.

Kyambogo University was specifically selected for this study because it is one of the few Ugandan public universities offering a dedicated Early Childhood Teacher Education programme. Prior literature has documented challenges at Kyambogo University including delayed student graduations, lost examination results, and limited student supervision (Kekimuri, 2023; Nakabira, 2013), making it an appropriate case for investigating the relationship between digital usability and staff performance.

In Uganda, Early Childhood Teacher Education (ECTE) is a relatively emerging discipline facing numerous challenges, including inadequate resources, limited infrastructure, and evolving professional expectations for academic staff. Kyambogo University has experienced concerns regarding staff performance, including delayed student graduations, lost examination results, and limited student supervision (Kekimuri, 2023; Kibalirwandi et al., 2023; Nakabira, 2013). While technology acceptance models suggest that perceived usefulness and ease of use determine technology adoption (Davis, 1989; Tubaishat, 2018), little empirical evidence exists regarding how the actual usability of digital resources relates to staff performance among early childhood teacher educators in the Ugandan context. The school bus environment, as noted in recent research (Nakintu et al., 2025), shares parallel challenges of inadequate adult support and training, suggesting a systemic pattern across non-classroom educational contexts in Uganda.

This study examines the relationship between usability of digital resources and job performance of academic staff in Early Childhood Teacher Education at Kyambogo University, Uganda. Grounded in Davis's (1989) Technology Acceptance Model, the research employed a correlational survey design with 100 academic staff respondents, using both quantitative and qualitative approaches. The study investigated how competence in word processing, spreadsheets, video conferencing, online instruction, and internet resources influences teaching, research supervision, and assessment performance. Findings indicate a strong positive correlation between digital resource usability and staff performance ($r = 0.624$, $p < 0.001$), though significant gaps persist in online instruction usage and institutional support. The paper concludes that strategic investment in digital infrastructure and structured training programmes is essential for enhancing technology integration in early childhood teacher education.

Objectives

1. To determine the level of usability of digital resources among academic staff in Early Childhood Teacher Education at Kyambogo University.
2. To establish the level of job performance of academic staff in Early Childhood Teacher Education at Kyambogo University.
3. To examine the relationship between usability of digital resources and job performance of academic staff in Early Childhood Teacher Education at Kyambogo University.

Theoretical Framework

This his study is underpinned by Davis's (1989) Technology Acceptance Model (TAM), which postulates that perceived usefulness and perceived ease of use determine an individual's intention to use a system, with intention serving as a mediator of actual system use. Perceived usefulness refers to the degree to which a person believes that using a particular system would enhance their job performance, while perceived ease of use refers to the degree to which a person believes that using the system would be free of effort (Susanto & Aljoza, 2015; Chau & Hu, 2002). In the context of early childhood teacher

educators, TAM suggests that usability of digital resources (the actual ability to effectively use technology tools) should positively influence job performance. The model also acknowledges external factors such as facilitating conditions, training, and organisational support that moderate this relationship (El-Said et al., 2020). This framework guided the selection of variables and the interpretation of correlational findings.

In this study, the strong positive correlation (r = 0.624) between usability and performance is interpreted through TAM: academic staff who perceive digital resources as both easy to use (perceived ease of use) and beneficial to their teaching and research (perceived usefulness) are more likely to adopt them, thereby improving job performance. The findings extend TAM by revealing that actual usability is influenced by infrastructure and training external factors the model acknowledges but rarely elaborates in the Ugandan higher education context.

LITERATURE REVIEW

Digital Resource Usability in Higher Education

Usability of digital resources refers to the degree to which academic staff can effectively and efficiently use technological tools to accomplish their professional tasks. Key digital resources include word processing software, spreadsheets, presentation tools, online instruction platforms, video conferencing applications, publication software, projectors, and internet-based communication tools (Andrea & Andrea, 2023). Research from developed countries indicates that educators who fully utilise digital technologies in all aspects of their professional life demonstrate improved learning outcomes and enhanced job performance (Kalyani, 2024). The British Educational Communication and Technology Agency identified user-ability of digital resources as one of the five key pillars of successful technology integration in educational institutions (Adarkwah & Huang, 2023).

However, the relationship between digital usability and staff performance is not universally positive. Akbar et al. (2025) and Cavicchioli et al. (2025) found that digital technologies can increase the number of demands placed on employees, leading to work-related stress and potential performance decrements. Similarly, Wang et al. (2023) noted that technology-related demands can have negative effects on employees' work experiences when not accompanied by adequate support and training.

The African and Ugandan Context

In the African context, studies have shown that while digital technologies hold promise for improving educational outcomes, significant barriers remain. Mathebula et al. (2025) found that South African teachers faced challenges including inadequate training, limited access to resources, and negative attitudes toward technology integration. Thaanyane and Jita (2024) reported similar findings in Lesotho, where staff in higher education institutions demonstrated limited digital usability despite positive attitudes toward technology. In Uganda, Waiswa (2024) noted that while digital technologies offer attributes of accuracy, speed, and unlimited instant communication, they also create managerial challenges. More recent reports indicate that early childhood educators confront significant barriers including inadequate access to computers, limited internet connectivity, insufficient projection equipment, and lack of structured digital training programmes (MoES, 2022). These findings suggest that the relationship between digital usability and staff performance in the Ugandan context requires empirical investigation.

Recent studies from elsewhere in Africa reinforce this conclusion. Mathebula et al. (2025) found that South African early childhood teachers faced barriers including inadequate training and limited access to

resources. Thaanyane and Jita (2024) reported similar findings in Lesotho, where higher education staff demonstrated limited digital usability despite positive attitudes toward technology. Within Uganda, Waiswa (2024) noted that while digital technologies offer speed and accuracy, they also create managerial challenges, while Emara et al. (2024) found that instructional supervision in Ugandan universities is constrained by inadequate digital tools for tracking student progress

Job Performance of Academic Staff

Job performance in teacher education is multidimensional, encompassing teaching (preparation, delivery, assessment), research and publication (proposal supervision, dissertation marking, knowledge generation), and community outreach (school practice supervision, extension services). Kozma (2009) found that use of applications like word processing, spreadsheets, online instruction, video conferencing, and the internet are major elements of both the learning environment and curriculum, strongly related to digital technology use in academic staff job performance. Pooja (2021) emphasised the growing demand to incorporate digital technologies in mainstream teaching in vocational and university education. However, in Uganda, concerns regarding staff performance have been documented, including delayed student graduations, lost examination results, and limited student supervision (Emara et al., 2024)

METHODOLOGY

This study adopted a correlational survey design to explain the relationship between digital usability and job performance (Nissinen, 2024). Both quantitative and qualitative approaches were employed, with emphasis on quantitative methods. The quantitative approach involved collection of numerical data to explain, predict, and control phenomena of interest, with data analysis being primarily statistical (Amin, 2005). Qualitative data from interviews supplemented the quantitative findings.

The target population comprised all academic staff in the Faculty of Education at Kyambogo University who teach or supervise courses related to Early Childhood Teacher Education. This included staff in the Department of Early Childhood Education, Department of Foundations of Education, and Department of Curriculum and Instruction, totalling approximately 180 academic staff. Using Krejcie and Morgan's (1970) table for sample size determination, a sample of 100 respondents was selected to ensure adequate statistical power for correlation analysis (Field, 2018).

Simple random sampling was used to select academic staff, while purposive sampling was used to select three administrators for in-depth interviews.

Two instruments were used: a self-administered questionnaire and an interview guide. The questionnaire measured usability of digital resources across eight indicators (word processing, spreadsheets, online instruction, video conferencing, publication software, projectors, internet, and email) using a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Job performance was measured across eight indicators including teaching preparation, time management, marking and returning coursework, supervising dissertations, and supervising school practice.

Content validity was established through supervisor review, yielding a Content Validity Index of 0.967, exceeding the recommended threshold of 0.7 (Amin, 2005). Reliability was tested using Cronbach's Alpha coefficient, with usability of digital resources achieving $\alpha = 0.736$ and job performance achieving $\alpha = 0.834$, both exceeding the acceptable threshold of 0.7 (Hasim et al., 2022).

Quantitative data were analysed using the Statistical Package for Social Sciences (SPSS). Descriptive statistics (frequencies, percentages, means, standard deviations) were used to summarise the data. Bivariate analysis employed Pearson's Linear Correlation Coefficient to test the relationship between

usability of digital resources and job performance at the 0.05 significance level. Qualitative data from interviews were analysed thematically. Triangulation of quantitative and qualitative findings enhanced the credibility and depth of the results.

Informed consent was obtained from all respondents. Anonymity and confidentiality were maintained by not linking respondents' identities to their responses. Participation was voluntary, and respondents were free to withdraw at any time.

STUDY FINDINGS AND INTERPRETATION

Background Characteristics of Respondents

Of the 100 respondents, the majority (52.0%) were over 40 years of age, while 28.0% were between 30 and 40 years, and 20.0% were below 30 years. Females constituted 64.0% of respondents, reflecting the gender distribution in early childhood education as a female-dominated field. Most respondents (75.0%) were married. In terms of academic qualifications, 65.0% held Master's degrees, 24.0% held Bachelor's degrees, and 11.0% held PhDs. Regarding length of service, 48.0% had worked at Kyambogo University for over ten years, 31.0% or between five and ten years, and 21.0% for less than five years.

Usability of Digital Resources

The findings revealed that the majority of respondents demonstrated high usability of word processing (87.0%), spreadsheets (93.0%), video conferencing (78.0%), projectors (88.0%), and internet/email (100%). However, online instruction usage was extremely low, with 92.0% of respondents disagreeing that they use online instruction platforms. Publication software usage was also limited, with 67.0% of respondents reporting non-use. The mean usability score was 3.35 (SD = 0.48) on a five-point scale, indicating moderate overall usability of digital resources. The minimum score was 2.40 and maximum 4.60, suggesting significant variation in digital competence among academic staff.

Interviews revealed three interconnected reasons for this low online instruction usage. First, there is no institutional policy mandating or incentivising learning management system use. Second, there is an absence of any training on online pedagogy. Third, unreliable internet connectivity makes synchronous or asynchronous online instruction frustrating for both staff and students. One respondent stated: "The university has a platform, but nobody uses it because we were never trained, and students cannot access it reliably from off-campus." Another added: "The university does not carry out on-job trainings in digital tools. If this is done, it can motivate and even encourage lecturers to use learning platforms."

Qualitative findings from interviews provided additional context. One administrator reported:

"There is lack of enough competence in digital technologies. Students' competent skills in creating, saving, retrieving files, use of computers for more than two applications, and use of other processing applications are inadequate. This goes hand in hand with limited time allocated to different classes to use the computers in the computer laboratory, which are also inadequate to accommodate all students at once."

Another respondent noted:

"Presence of most digital tools at the university is inadequate to accommodate all. There are few computers; the bandwidth is also small as well as poor connectivity to the internet. These delays work that would have been done on time."

A third respondent highlighted training gaps:

"The university does not carry out on-job trainings in digital tools. If this is done, it can motivate and even encourage lecturers to use learning platforms that are designed for the institution, which currently

nobody is using due to lack of training."

Job Performance of Academic Staff

The findings indicated generally positive job performance across most indicators. Notably, 100% of respondents agreed that they keep records of marks for their students and mark and return students' proposals. High percentages also reported marking and returning coursework (87.0%) and dissertations (93.0%). However, time management emerged as a concern, with 26.0% of respondents disagreeing that they keep time for duties and functions. The mean job performance score was 3.05 (SD = 0.41), indicating moderate overall performance. The minimum score was 2.00 and maximum 3.88, suggesting variation in performance levels among academic staff.

Qualitative findings supported these results, with one administrator noting:

"Shifting the emphasis from teaching to learning can create a more interactive and engaging learning environment for teachers and learners. The role of teachers will change from knowledge transmitter to that of facilitator, knowledge navigator, and sometime co-learner. Learners will have more responsibilities of their own learning as they seek out, find, synthesise, and share their knowledge with others."

Relationship between Usability of Digital Resources and Job Performance

Pearson's Linear Correlation Coefficient was computed to test the hypothesis that usability of digital resources has a positive relationship with job performance. The analysis revealed a strong positive correlation between usability of digital resources and job performance ($r = 0.624$, $p < 0.001$). This correlation is significant at the 0.01 level, indicating that the relationship is highly unlikely to have occurred by chance. The research hypothesis was therefore accepted, and the null hypothesis rejected. The coefficient of determination ($r^2 = 0.389$) indicates that approximately 38.9% of the variance in job performance can be explained by usability of digital resources, suggesting substantial practical significance.

DISCUSSION

The finding that usability of digital resources has a strong positive relationship with job performance of early childhood teacher educators at Kyambogo University ($r = 0.624$, $p < 0.001$) aligns with previous research. Kozma (2009) found that use of applications like word processing, spreadsheets, online instruction, video conferencing, and the internet are major elements of both the learning environment and curriculum, strongly related to digital technology use in academic staff job performance. From the perspective of the Technology Acceptance Model (Davis, 1989), academic staff who find digital resources easy to use (ease of use) and beneficial for their work (perceived usefulness) are more likely to adopt and integrate these resources into their professional practice, leading to enhanced performance.

The finding that academic staff demonstrate high usability of basic productivity tools (word processing at 87.0%, spreadsheets at 93.0%) reflects the fundamental importance of these tools for daily academic tasks including lecture preparation, grading, and communication. However, the very low usage of online instruction platforms (only 8.0%) represents a significant gap in digital integration. This finding is concerning given the global shift toward blended and online learning, accelerated by the COVID-19 pandemic. Markauskaite (2023) noted that digital skills of teachers enhance their teaching theoretically and practically, and that there is a growing demand to incorporate digital technologies in mainstream university education. The absence of online instruction usage suggests that early childhood teacher

educators at Kyambogo University have not yet transitioned from basic productivity tools to pedagogical digital integration.

The qualitative findings revealed that inadequate digital infrastructure, few computers, small bandwidth, poor internet connectivity, echo challenges documented elsewhere in Sub-Saharan Africa. Rachmad (2025) emphasised that efficient and effective use of technology depends on availability of hardware and software and equity of access to resources. Botelho (2021) similarly found that lack of access to computers and software was a major impediment to computer integration. In the Ugandan context, these infrastructural deficits are compounded by irregular power supply and high costs of internet data, further constraining digital usability.

The absence of on-job digital training identified by respondents is particularly problematic. Kaimara et al. (2021) and Pappa et al. (2024) found that lack of digital focus in initial teacher training is a barrier to teachers' use of digital technologies in the classroom. Where there is no effective training on digital technologies and educational technology, teachers will not be able to use digital resources for integration in teaching and learning. This finding suggests that even when digital resources are available, their usability and consequently their impact on job performance is limited without accompanying professional development. The study therefore extends the Technology Acceptance Model by highlighting that perceived ease of use and usefulness are not sufficient; actual usability is mediated by training and ongoing support.

Within the Ugandan context, Kibalirwandi et al. (2023) found that doctoral students' progress was hindered by staff's limited digital competence, echoing this study's finding on publication software non-use (67.0%). Similarly, Emara et al. (2024) reported that instructional supervision in Kampala universities is constrained by inadequate digital tools for tracking student progress, consistent with the 26.0% of staff who disagreed that they keep time for duties. These parallel findings suggest that digital usability challenges at Kyambogo University may reflect broader systemic issues across Ugandan higher education institutions.

CONCLUSION

This study concludes that usability of digital resources has a strong positive relationship with job performance of academic staff in Early Childhood Teacher Education at Kyambogo University. Staff who demonstrate higher competence in using word processing, spreadsheets, video conferencing, projectors, and internet resources perform better in teaching, research supervision, and assessment responsibilities. However, significant gaps exist in online instruction usage and publication software competence. Furthermore, inadequate digital infrastructure, limited internet bandwidth, and absence of structured digital training programmes constrain the full realisation of digital technologies' potential benefits for job performance. The school transportation environment shares similar challenges of inadequate adult support and training, suggesting a systemic pattern across non-classroom educational contexts in Uganda.

This study has several limitations. First, while the sample of 100 respondents provides adequate statistical power, the study was conducted at a single public university (Kyambogo University), limiting generalisability to other Ugandan universities or private institutions. Second, the correlational design does not permit causal inference. Third, self-reported performance measures may be subject to social desirability bias. Fourth, the study focused only on early childhood teacher education; findings may not apply to other disciplines. Future research should employ longitudinal or experimental designs, include

objective performance metrics such as student outcomes or publication records, and expand to other universities across Uganda to test the generalisability of these findings.

Recommendations

To enhance digital usability and job performance among early childhood teacher educators at Kyambogo University, a phased approach is recommended.

Phase 1 (0–6 months): Establish a peer-led digital support group within the Faculty of Education; use free platforms (WhatsApp, Telegram, free Moodle hosting) for basic online instruction. Conduct a simple audit of existing digital resources and staff skill levels.

Phase 2 (6–12 months): Advocate for a dedicated budget line for ECD digital infrastructure within the university. Seek partnerships with NGOs and development partners (e.g., UNICEF, Save the Children) who fund ECD digital initiatives. Introduce voluntary, low-cost training sessions led by digitally proficient staff.

Phase 3 (12–24 months): Develop a mandatory, accredited short course in digital pedagogy for all ECTE staff, integrated into staff performance evaluations. Establish a dedicated digital support unit within the Faculty of Education to provide technical assistance, troubleshooting, and sharing of best practices.

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