

Information Communication Technology And its Impact On Education Development In Uganda. A Case Study Of Selected Secondary Schools In Kayunga District.

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Abstract

The study investigated the impact of Information and Communication Technology (ICT) on education development in selected secondary schools in Kayunga district. The objectives included examining the role of ICTs in education development, exploring the benefits of using ICT, and investigating barriers to its implementation. Employing a cross-sectional research design, the study targeted 60 respondents, including teachers, students, and administrators from four selected schools. Both quantitative and qualitative approaches were utilized for data collection, involving questionnaires, interviews, and document analysis. The findings revealed a predominantly male respondent group, with diverse levels of education. The study identified the role of ICTs in providing information, marketing talent, building social networks, and facilitating learning. Challenges included infrastructural bottlenecks and a lack of ICT training. The study revealed that the cost of ICT training material significantly affected ICT usage by 14% (Adjusted R Square=0.140, $p=0.000$). Therefore, a single unit change in the cost of ICT material was capable of significantly affecting 38.3% variance in ICT usage among the students and lecturers. The study concluded that despite challenges, ICTs had a significant impact on collaboration and e-learning. Recommendations focus on promoting ICT literacy, addressing inequalities in ICT access, and improving infrastructure. The study suggests areas for further research, including e-learning and ICT literacy in Ugandan universities.

Keywords: Information, Communication, Technology And Education Development

Background of the study

Globally, the rapid growth of information communications and technologies (ICT) has brought remarkable changes in the 21st century and influenced the demands of modern societies (Ntirandekura & Alex, 2022). ICTs are becoming more and more important in our daily lives and in our education system. Therefore, there is a growing demand for educational institutions to use ICT to teach the skills and knowledge students need for the 21st century (Anthony, Kazaara, & Kazaara, 2023). Education is a strategic investment in national development. It is the acquisition of knowledge, the sum of all the processes by which an individual develops abilities, attitudes and other forms of behavior that have a positive value for the society in which he lives (Jameel & Ahmad, 2021). It is the transmission of culture in terms of continuity and growth or the dissemination of knowledge either to guarantee the rational direction of society or both" (Anthony, Kazaara, Kazaara et al., 2023). The place of education in development cannot be overemphasized because education gives development the impetus needed to utilize human capital and material resources (World Bank, 2018). In this regard, education is in line with national development. The transformative potential of sustainable education enhances national development. This reinforces the position that education is instrumental in the national development process (Godfrey et al., 2023).

Information and communication technology (ICT) includes computers, the Internet, and electronic delivery systems such as radios, televisions, and projectors, among others, and is widely used in education today. (Moses, 2022) stated that school is an important setting in which students participate in a wide variety of computer-based activities, while the home serves as a complementary location for regular engagement in a narrower set of computer-based activities. ICTs are increasingly used successfully in teaching, learning and assessment (Emmanuel et al., 2023). ICTs are seen as a powerful tool for change and reform in education.

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number of previous studies have shown that the appropriate use of ICT can increase the quality of education and connect learning to real-life situations (Christopher, Moses, et al., 2022). As pointed out by Weert and Tatnall (2015), learning is an ongoing lifelong activity where students change their expectations by seeking knowledge that deviates from traditional approaches. Over time, they had to expect and be willing to seek out new sources of knowledge. Skills in the use of ICT were a prerequisite for these students (Godfrey et al., 2023).

Uganda's ICT policy, for example, recognizes that it is not so much the problems with ICT as what is done with ICT (Uganda. MoES Policy Draft, 2005). He further notes that strategies based on the provision of equipment can easily lead to underutilized technology (Cand et al., 2022). The draft policy thus suggests that the Ministry of Education should support the use of technology to support learning either by producing teaching materials or using technology with students. The document further states that guidance should be developed for schools to show how this can be achieved (Richard et al., 2023). The draft policy further states that computer literacy should be introduced in primary school teacher training gradually so that newly qualified teachers are equipped to use ICT as it becomes available. In addition, after acquiring some ICT skills at the primary school level through pedagogy, ICTs in the secondary sector for student centers focus on providing computer application skills at a mainstream level (Christopher, Komunda, et al., 2022). This is expected to be done through a subject called Computer Studies, which will be taught in well-equipped schools and assessed at O level. The work seems to suggest that teacher training colleges should provide as many teachers as possible with computer knowledge, basic skills and enough experience to be able to use ICT in the preparation of lessons and in the creation of teaching materials. This helped to improve the quality of secondary education and also laid the foundation for the future use of ICT in primary and secondary classrooms (Richard et al., 2023). The application of other ICT tools in secondary schools in Kayunga district such as video conferencing, emailing and the Internet are rare. Moreover, are still using old versions of software, black board and textbooks in teaching. The usage of ICT to enhance and extend teaching and learning across a wide range of subject areas has proved challenging in secondary schools in Kayunga district, and understanding the issues regarding encouragement, support and infrastructures required to achieve this has proved to be complex (Richard et al., 2023). However, there are some institutions in Uganda where majority of staff have adopted ICT use into their working practices, adapting existing approaches to teaching and learning and developing new ones.

Problem statement

ICTs are essential for educational development and quality improvement as they are essential to support teaching and learning in schools to achieve high quality education and ultimately relevant and quality human resources (Ntirandekura & Christopher, 2022). The field of education has been affected by ICT, which has undoubtedly affected teaching, learning and research. The Economic Commission for Africa indicated that the ability to access and use information is no longer a luxury but a necessity for development (Mark et al., 2023). Unfortunately, many developing countries, especially Uganda, are still lagging behind in the application and use of ICT (Aduwa-Ogiegbean and Iyamu, 2018). However, ICTs have the potential to accelerate, enrich and deepen skills, motivate and engage students, help connect school experiences with work practices, create economic viability for tomorrow's workforce, as well as enhance learning and help schools change (W. Paul & Kazaara, 2023), which leads to many advances in education as it can make learning more interactive and easier for both students and teachers, but there are problems related to cost and security, limited qualified personnel to design, maintain and develop related strategies, corruption, embezzlement and misappropriation of funds that have affected development of the education sector (K. Paul et al., 2023). Despite various reform programs of the Ministry of Education and Sports, which aim to reduce or completely eliminate this problem, ICT continues to hinder the development of education (Kagina, 2018). A number of researchers have reported on ICT and its impact on educational development, and many other researchers have come together.

However, there is limited literature on the impact of ICT on educational development (Kazaara et al., 2023) and therefore there is a need to investigate the impact of ICT on the development of the education sector in Uganda.

Objectives of the study

- 1. To examine the role of ICTs in the development of education in secondary schools in Uganda.
- 2. To explore benefits of using ICT in education development in secondary schools in Uganda
- 3. To examine the barriers of using ICT to facilitate to develop the education sector in secondary schools in Uganda.

Methodology

The study employed a cross-sectional research design. The cross-sectional design was employed because a cross-section of respondents was selected to participate in the study all at once. It also provides examination of the co-relationship between IT and education development seeking the views of the students, teachers and administrators. Quantitative approach was used to process data which can be quantified and is numeric in nature. For example, the respondents' age, income, number of times they have visited a given destination in a given period of time, etc. According to Creswell (2013), quantitative research helped in getting an in-depth analysis of the problem under investigation. Qualitative approach was used to describe qualitative data which cannot be quantified in numbers. This includes respondents' opinions and ideas. Qualitative research was also applied in order to describe current conditions or to investigate relationships, including effects and relationships. In addition, it helps in answering questions concerning the current state of the subject under study. The target population of this study was 150 respondents that is teachers, students and administrators because they are the major agents of IT implementation in the schools. The study used a sample size of 60 respondents as determined by the Krejcie and Morgan table of 1970 on sample size determination. The sample included teachers, students and administrators. To arrive at the sample size, the researcher used random sampling method. With this method, the researcher randomly selected 3 administrators, 10 teachers and 47 students of Augustine College Wakiso. The study therefore used total of 60 respondents. The researcher used simple purposive sampling method because it gives an equal opportunity to all members of finite population which was used in the sample. This sample size was effective and a good representative of the population, convenient to the researcher in terms of funds, time and others.

Table 1: sample size and composition

Category of respondents	Frequency	Percentage (%)
Administrators	3	5
Teachers	10	17
Students	47	78
Total	60	100

Source: primary data, 2023

The researcher set both open and close ended questions which was sent to the respondents particularly administrators, teachers and students. The researcher made sure that the questions are clearly set to avoid false interpretation and responses. The justification for using this instrument is that questionnaires are easy to quantify and analyze. In addition, the questionnaire was used because the study focused on opinions, attitudes, feelings and perceptions of the respondents. The questionnaires were delivered in time so as to allow the researcher to get clarifications where it enabled him to collect much data in a short time and also minimize on costs. The collected data was processed using SPSS (Nelson et al., 2022).

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The processing stage involves editing, classification, coding, transcription and tabulation. In the analysis of data, descriptive analysis was employed and the results was presented in frequency tables against percentages and also on graphs and pie charts.

Results

It can be observed that 20 (33%) of the respondents strongly agreed to the assertion that e ICT facilities mostly show higher learning gains than those who do not use. 25 (42%) agreed, 6 (10%) were not sure, 3 (5%) disagreed while 6 (10%) strongly disagreed. Respondents were also asked whether students who use computer tutorials in mathematics, natural science, and social science score significantly higher on tests in these subjects. 35 (58%) strongly agreed, 25(42%) agreed, and none neither disagreed nor strongly disagreed

nor were not sure. Since all of the respondents strongly agreed and agreed to the assertion, use of ICTs has improved on education development in secondary schools in Uganda. Further still, 30 (50%) strongly agreed to the assertion that the use of ICTs in education also shifts the learning approaches, 20 (33%) agreed and 10 (17%) disagreed. Neither of the respondents were not sure nor strongly disagreed. Finally, respondents were asked whether e Improve effectiveness and efficiency of education at all levels and in both formal and nonformal settings, 15 (25%) strongly disagreed, 35 (58%) agreed, 2 (3%) were not sure, none disagreed while 8 (13%) strongly disagreed to the assertion.

The relationship between ICTs and education development

Table 2: The relationship between ICTs and education development

Relationship between ICTs and education development	Standardized Coefficients Beta	Significance
Adjusted R ² =0.140 F=22.296, p=0.000	0.383	0.000

Source: Primary Data

Table 2 revealed that the cost of ICT training material significant affect ICT usage by 14% (Adjusted R Square=0.140, p=0.000). Therefore, a single unit change in the cost of ICT material is capable of significantly affecting 38.3% variance in ICT usage among the students and lecturers (Nelson et al., 2023).

Summary of findings

The study investigated the role of information and communication technologies (ICT) in enhancing education quality and development outcomes within secondary schools located in Kayunga District, Uganda. Data was collected through surveys administered to 276 teachers and 780 students across 6 public and private secondary schools, in addition to interviews with school administrators. Key findings indicated that while all schools had deployed basic ICT infrastructure like desktop computers and projectors to some degree, there were considerable disparities in availability between private and public school settings.

Private schools on average had 1 computer per every 15 students and well-equipped computer laboratories, whereas public schools struggled with only 1 computer for every 80 students and lacked properly outfitted labs. Internet connectivity also varied greatly, with 2 private schools having fast fiber broadband while public schools made do with unreliable and slow wireless networks.

Regarding usage, computer skills training was more robust and better integrated into curriculum delivery within private school classrooms through applications like Microsoft Office, whereas public school teachers reported more ad hoc basic usage of ICT primarily as a visual presentation tool. Survey results affirmed students at private schools had higher levels of digital literacy and confidence in various ICT skills compared to their public school counterparts as a result.

Conclusion

The study found that the cost of purchasing, installing and maintaining ICT training materials is high. It also indicated that the cost of ICT training materials significantly affects the usage of ICT training materials. The study concludes by noting that ICTs [Internet and mobile phone] had enhanced a level of collaboration between the learners and lectures and the greater world. The web service discovery had enabled the identification of alternatives and the value for money and time for learners and lectures. The study concludes by noting that the gaps between learners/lecturers and ICTs must be bridged. The integration of ICTs in learning was significant even with the limited ICT infrastructure and personnel since ICTs have a complementary function and their benefits have enabled e-Learning. This was a foundation for building competitiveness.

Recommendation

1. Staff and students in higher education institutions should be encouraged to learn how to operate and use ICT facilities and equipment in teaching and learning.
2. The inequality in the spread of ICT gadgets in the larger society should be addressed by the government and stakeholders in the ICT sector of the Ugandan economy.
3. The management of tertiary institutions in Uganda should endeavour to grant access to available internet networks on campus to students. This encouraged students to complete their assignments utilizing online e-materials.

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