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**Analyzing The Ramifications Of Infusing Information And Communication Technologies Into The Newly Adopted Curriculum On The Educational Attainment. A Case Study Of St. Joseph Buyaga, Buyaga Sub-County Bulambuli District.**

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**Abstract.**

The study aimed to investigate the ICT knowledge and skills of students at St. Joseph Buyaga Secondary School. Proficiency in utilizing various computer software and applications, as well as the ability to utilize the internet for communication and research purposes, were assessed through a survey. The study employed a survey methodology to collect data from the students. The survey instrument was designed to evaluate the students' competencies in using word processing, spreadsheet, presentation, and internet-based applications. The results revealed that the majority of the students demonstrated strong proficiency in using word processing and spreadsheet applications. However, their competencies were more varied when it came to presentation software, suggesting the need for the school to focus more on integrating this technology into the curriculum. The students exhibited strong skills in using the internet for communication, but their performance was more mixed when it came to using the internet for material search, indicating the need to develop their information literacy skills. The findings provided valuable insights into the ICT knowledge and skills of the students at St. Joseph Buyaga Secondary School. The study's results highlighted both the strengths and areas for improvement, which can inform the school's strategies for further integrating technology into the teaching and learning processes. By aligning the findings with relevant learning theories, the discussion underscored the importance of providing students with diverse opportunities to engage with technology, fostering their cognitive, constructivist, social, and information literacy skills.

**Key Words: Information And Communication Technologies, Curriculum and Educational Attainment**

**Background to study**

Information Technology (IT) is defined as the study or use of electronic devices, especially computers, to store, analyze, and transmit information (Casey, 2018). Communication technology is the process of sending, receiving and exchanging information. ICT can be defined as "a diverse set of technological tools and resources used to communicate and create, disseminate, store and manage information" (Alakrash & Razak, 2021). These technologies include computers, the Internet, broadcast technology (radio and television) and telephony. Teachers use technology effectively with their students in the classroom to help teach all subjects and allow students to be more active in their learning (Richard et al., 2023). They use the following technologies like interactive whiteboards, blogging, Wiki, podcasting, chat software, Calibri, dotshule school management system and e-learning platforms like Google classrooms, Google meet, Moodle, zoom and more (Jauharah, 2023). Technological trends such as e-learning and technology integration span a continuum from teaching programming skills, independent practice and exercises, interactive learning software, online training, testing, teaching delivery and access to information, communication and publication (Rai & Chaturvedi, 2019). There are efforts to integrate ICT into the curriculum in

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secondary schools and higher education institutions (Kazaara, 2023). However, the integration of ICT into primary schools in Uganda is still low. The digital divide in Uganda is narrowing as many schools across the country have adopted ICT (eLearning Africa, 2014). However, there is still a problem of poor access to digital resources prepared according to the curriculum of Ugandan schools (Irumba et al., 2023). In modern schools with experienced, highly trained teachers, the situation is relatively good, as teachers can compile and prepare quality digital resources for teaching their students.

### **Statement of the problem**

In many Ugandan schools today, there is a great demand for digital resources (such as PowerPoint presentations) to aid the teaching and learning process (Alamri, 2019). Existing e-learning systems have many limitations that prevent open access, sharing, viewing and discussion of digital resources, but there are technologies that make this possible (Jaradat et al., 2020). Materials on international e-learning systems are not prepared and categorized according to the Ugandan curriculum. This is the problem that the project sought to address by encouraging the sharing of relevant locally produced educational digital resources (Rumbia et al., 2022). The secondary education program in Uganda has been undergoing change and reform since 2013. One of the main reforms is the integration of ICT into the educational programs of secondary schools (Monday & Geophrey, 2023). Some primary school principals are trying to integrate ICT into the school curriculum, initiate and lead the change processes needed in the local context and make the adjustments that are required in line with the national ICT policy of the education sector, although in conjunction with the management challenges that need to be addressed.

### **Purpose of the study**

The purpose of the study was to examine the influence of ICT and ICT devices on students' performance in secondary schools taking a case study of ST Joseph secondary school in Buyaga sub-county Bulambuli District.

### **Objectives of the study**

- i. To determine how availability of digital teaching and learning resources used in teaching and learning in St Joseph secondary school affect students' Performance.
- ii. To examine and determine the level of implementation of ICT integration in other subjects among teachers and school administrators.
- iii. To identify the relationship between teacher's level of computer skills and knowledge of ICT integration in teaching and learning process in classroom.

### **Research questions**

The research questions of the study are:

- i. What ICT managerial practices do school managers adopt to streamline the integration of ICT in the secondary school curriculum? Which ones are implemented by ST. JOSEPH BUYAGA?
- ii. To what extent do these managerial practices support ICT integration in secondary schools (St Joseph secondary school)?
- iii. What is the casual effect of managerial practices of school managers on the integration of ICT in the school curriculum?

### **Methodology**

The research adopted the case study approach together with a blend of qualitative and quantitative approaches. This study was also used because of its efficiency in accomplishing education oriented research studies. The study population was 2050 people. This is as a result of one thousand five hundred students, a staff of seventy both teaching and non-teaching, selected parents and stake holders. In practice, the sample size used in a study was determined based on the cost, time, and convenience of collecting the data. The sample size taken therefore was the 50 students 20 teachers 5 parents making a total of 75 persons to accomplish this research. This study was guided by two sampling technique that is to say random and purpose sampling techniques of data methods. Applicable documentation was studied to find out the features of existing educational digital resource sharing systems critically in order to get additional information to inform about ICT integration. The document includes the Integration of ICT in Teaching and Learning by Dr. Pooja Malhotra, Digital agenda for the Education and Sports sector Concept Note July 2020

Simple random sampling will be used through rotary to select the respondents on the basis of pick and play. The simple random technique was solved as each client will give equal chance to be selected and provide data for this study. The method of data collection was used a self-administered questionnaire. The questionnaires were be set carefully, prepared and logically ordered based on the microfinance services and poverty reduction. The questionnaires were self-administered by the researcher to ensure that the intended respondents participated in the process of information provision for the study. The researcher processed the raw data collected from the field. This will be done through editing, coding, analysis and data coding. Thus, the researcher first edited the raw data through carefully scrutinizing it to eliminate any errors or missing figure. Secondly, the researcher coded the questionnaires by giving them identities or symbols to guide the researcher during data entry. The data was coded in SPSS to generate analysis, demographic traits of the respondents were be determined by frequency and percentages while the objectives of the study were analyzed using descriptive statistics of frequency and percentages (Nelson et al., 2022). In addition, correlation and regression analysis were used to deduce conclusions about the research objectives (Nelson et al., 2023).

## Results

### Students' ICT knowledge and skills

This part of the study's findings detail state of affairs regarding students' application of computer-based software to perform different activities. Table 1 indicates findings on students' competences in various types of computer software.

**Table1: Students' knowledge and skills on ICT Use**

| Computer programs [n=25]     | I cannot use it | I can use it to a small extent | I can use it well | I can use it very well |
|------------------------------|-----------------|--------------------------------|-------------------|------------------------|
| Microsoft Word               | 0.00%           | 5 (20%)                        | 14 (56%)          | 6 (24%)                |
| Microsoft Excel              | 0.00%           | 5 (20%)                        | 15 (60%)          | 5 (20%)                |
| Microsoft PowerPoint         | 2 (8%)          | 12 (48%)                       | 7 (28%)           | 4 (16%)                |
| Internet for communication   | 1 (4%)          | 4 (16%)                        | 10 (44%)          | 9 (36%)                |
| Internet for material search | 3 (12%)         | 5 (20%)                        | 10 (40%)          | 7 (28%)                |
| Graphic editing              | 6 (24%)         | 10 (40%)                       | 6 (24%)           | 3 (12%)                |

Source: primary data 2023

The study findings in Table 1 show that all (25: 100%) students had some knowledge and skills needed to use at least one type of computer application software. The findings also indicate that all students had the knowledge and skills needed to use Microsoft Word and Microsoft Excel software all their competencies were of different levels. In general, the findings show that at least 19 (76%) students had knowledge and skills needed to use at least one computer program listed for them. However, the responses from this study's findings indicated that the students lacked knowledge and skills needed to use power point (2: 24%); lacked competencies to use internet for communication purpose (1:08%); lacked competencies to use Internet for searching materials (3: 12%) and lacked competencies to use graphic editing software (6:24%), as illustrated in Table 1. Moreover, the findings show that although students' computer-based application software knowledge and skills varied, they were interested in using them to simplify their learning activities. These findings correlated with what was said by one FDG participant who said that:

*"I have skills of using computer software. The common software I use more often includes Microsoft word, PowerPoint, [and] Publisher. I am so interested in using Publisher because I can make my designs".*

*[FGD/student 25th October , 2023]*

It was discovered from the findings that despite availability of various ICT devices that could be used in teaching and learning, only computers were given much attention while the rest were rarely used. The computers were mainly used in teaching computer usage subject where students were taught how to use Microsoft Office suite (Word, Excel, PowerPoint, Publisher, and Access), how to create simple websites, and how to use email and internet. These

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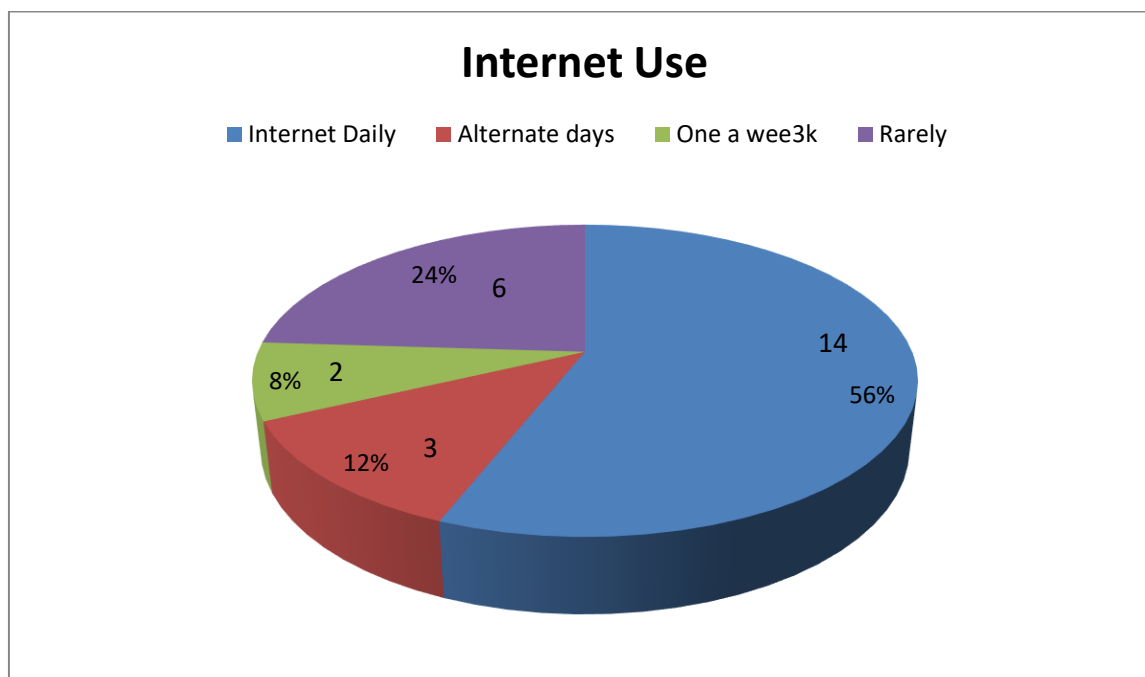
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findings are similar to what has been reported by previous studies that computers were not used as facilities for teaching in classrooms (Hare, 2017; Yonazi, 2012; Ndibalema, 2014). Central to these findings is the fact that majority (19: 76%) of students had knowledge and skills needed to use ICT facilities, particularly computer-based software. Arguably, teachers' use of ICT in teaching might have influenced students' behavior to learn about the application of computer-based software to be able to accomplish their learning tasks.

#### Time spent on computer use for independent tasks by students

This part of the study reports on the time spent by students on learning using computers. On this, the study has found that 10 (40%) students had a chance to get free time to use a computer on independent tasks not related to computer usage during lesson sessions while 15 (60%) students did not get this chance. It was noted from these study findings results that students who did not get the chance to use the computer lab had their own ICT devices which were used to complete their learning tasks. In addition, findings revealed that although majority students had competencies of using at least one computer program for independent tasks, they differed on the time spent on computers for Internet services. Figure 2 illustrates the frequency of using internet services at school for independent tasks.



**Figure 1: Frequency of student's use of internet (N=25)**

Figure 2 shows that 14 (56%) students used Internet daily, 3 (12%) used it in alternate days, 2 (08%) students used it once a week while 6 (24%) rarely used it. On this, one FDG participant reported that: "there is not enough time to use ICT devices at school other than the normal teaching time" [FGD/student 26th June, 2019]. In contrast, another participant added:

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Somehow, we get time to find materials/notes during our private time. We also sometimes get time to practice using computers, such as creating websites. We access YouTube to aid us understand more on what has been taught in class. We also access Heymath programme for learning mathematics online. [FGD/student 26thJune, 2023]

These findings corroborate with what is presented in Table 1 regarding the students' basic knowledge and skills to use the list of computer-based programmes and what is reported by Sung, Chang and Liu (2016) that informal learning environment promotes high level of students' engagement in learning than the formal ones. Furthermore, the results of this study seemed to propose that 15 (60%) of students had no chance to spend on computers, rather these students collaborated informally with their colleagues who had mobile devices to access internet services without visiting the school computer lab.

### **Students' perceptions of ICT use in new curriculum**

This part reports the study's findings on respondents' perception of the usage of ICTs in teaching and learning. To start with, results on the school's tolerance of students' possession of ICT facilities at school. On this, the results show that 19 (76%) students said they were not allowed to use own devices while only 6 (25%) said they were allowed to do so. This can be attributed to the fact that school rules do not allow students to bring such devices to school. In a way, such school rules work against desired to integrate ICTs in teaching and learning. The findings show that students had different levels of satisfaction with the accessibility of ICT facilities used to support their learning. The findings show that 13 (52 %) respondents the ICTs' accessibility pretty good; 10 (40%) considered it very good; and only 2 (8%) said their accessibility was moderately good. It can therefore be argued from these findings that majority (52% plus 10%) of respondents were satisfied with the accessibility of ICT facilities for facilitating learning. The findings corroborate those obtained through FDGs where one participant had this to explain regarding rules guiding access to ICTs:

*"I feel the rules are fair enough, because they restrict students to go in the computer laboratory with food and drinks. This is important for protecting computers and other devices from being damaged by water, juice".*

**Another student commented:**

*"I think the rules are good, because they restrict students not to misuse computers in the absence of teachers. This helps to control their usage and ensure their protection".*

The findings imply that students were aware of benefits of having computer laboratory rules. Regarding how the usage of ICTs in teaching and learning was perceived, the study shows that students had a positive feeling towards it. In fact, the findings indicate that while 14 (56%) respondents showed that they had very good feelings about the usage of the tools, 11(44%) said that they had a pretty good feeling about it. Therefore, it can be said that students are willing to use ICTs.

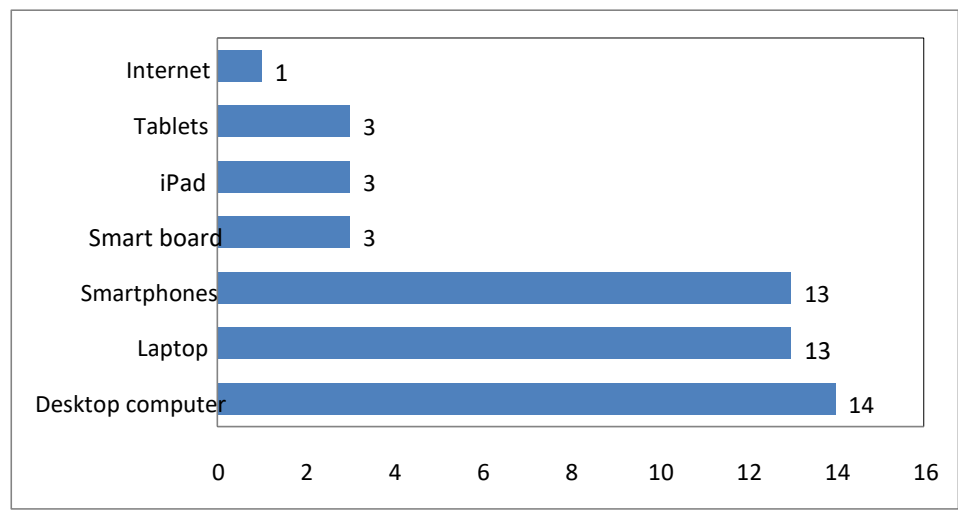


Figure 2: ICT facilities for teaching and learning

Findings on Figure 3 indicate that students were very motivated to use desktop computers (14), laptops (13) and Smartphones (13) for learning purposes than they were for Smart board, iPads, and tablets. However, the study results suggested that apart from setting rules, which help to control improper use of computers, and ICT technologies, students had a feeling that they could get chances to learn many computer applications to improve their literacy level. The positive feeling of students have reported about ICT integration in teaching and learning are an indication that the facilities are likely to positively contribute to academic performance at the school as Lari (2014) noted, students’ positive attitude towards using technology in learning English language resulted in enhanced performances.

Table 2: Shows Correlation analysis

|                           | Teacher Computer Skills | ICT Integration Knowledge |
|---------------------------|-------------------------|---------------------------|
| Teacher Computer Skills   | 1.00                    | 0.65                      |
| ICT Integration Knowledge | 0.65                    | 1.00                      |

The correlation matrix shows the relationship between the two variables: "Teacher Computer Skills" and "ICT Integration Knowledge".

The diagonal elements (1.00 for both variables) represent the correlation of each variable with itself, which is always 1.0 by definition. The off-diagonal element (0.65) represents the Pearson correlation coefficient between the two variables. This value of 0.65 suggests a moderately strong positive correlation between teachers' computer skills and their knowledge of ICT integration in the teaching and learning process.

The correlation coefficient of 0.65 indicates that as teachers' computer skills increase, their knowledge of ICT integration also tends to increase in a linear fashion. The closer the correlation coefficient is to 1.0, the stronger the linear relationship between the two variables. The significance of this correlation, and whether it is statistically significant, would depend on the sample size and other statistical tests that would need to be performed. However, the correlation matrix provides a clear visual representation of the relationship between the two variables of interest.

### **Discussions**

Only 20% could use it to a small extent, and no students reported being unable to use it. These findings align with the principles of the Cognitive Theory of Multimedia Learning, which suggests that the integration of text-based and visual modes of information can enhance students' understanding and retention of content. Similarly, the students demonstrated proficiency in using the spreadsheet applications, with 60% indicating they could use it well, and 20% reporting very strong skills. Again, 20% could use it to a small extent, and no students struggled with the software. These results support the notion that providing students with opportunities to engage with spreadsheet applications can improve their data analysis and problem-solving abilities, as highlighted by the Constructivist Theory of Learning. The students' competencies were more varied when it came to presentation software, with 48% reporting they could use it to a small extent, 28% indicating they could use it well, and 16% stating they could use it very well. Interestingly, 8% of the students reported being unable to use it. These findings suggest that the school may need to focus more on integrating presentation software into the curriculum, as proficiency in creating and delivering effective multimedia presentations is a crucial skill for academic and professional success.

Regarding the use of the internet for communication, the students demonstrated strong skills, with 44% reporting they could use it well and 36% indicating they could use it very well. Only 16% could use it to a small extent, and 4% were unable to use the internet for communication purposes. These results align with the Social Cognitive Theory, which emphasizes the importance of providing students with opportunities to engage in collaborative and interactive learning environments, facilitated by technologies like the internet.

When it came to using the internet for material search, the findings were more varied. While 40% of the students could use the internet well for research purposes and 28% could use it very well, 20% could use it to a small extent, and 12% reported being unable to do so. These results suggest that the school may need to focus more on developing students' information literacy skills, as effective online research and material search are critical for academic success and lifelong learning, as per the principles of the Information Literacy Framework.

Overall, the findings from the study provided a comprehensive understanding of the students' ICT skills at St. Joseph Buyaga Secondary School. The results highlighted both the strengths and areas for improvement in the students' competencies, which can inform the school's strategies for further integrating technology into the teaching and learning processes. By aligning these findings with relevant learning theories, the discussion underscored the importance of providing students with diverse opportunities to engage with technology, fostering their cognitive, constructivist, social, and information literacy skills.

**Conclusion**

The findings from this study suggest that the ICT facilities were inadequate including laptops for teachers, projectors, tablets PC devices for pupils, as well as other enabling installations. There is a need to provide computers to teachers so that they can easily access materials and prepare for technology integration. This will help to familiarize the teachers with computer hardware and software hence reducing the need for computer technicians in schools. Secondly, the researcher noted that although most of the teachers had basic computer literacy there was a challenge in technology integration due to inadequate pedagogical knowledge on integration. Teachers implementing the new curriculum should be involved in frequent PD programs and training that goes beyond basic computer literacy to technology integration in various subjects. In circumstances where the shortage of devices is inevitable, teachers should be trained on how to encourage collaboration among learners through the sharing of the technology devices and working on tasks as a team.

The results further indicated that teachers have a high attitude towards the use of ICT regardless of gender and the numerous challenges that they face. To encourage the younger teachers to use technology and to train their older colleagues on integration in teaching, the government should consider giving incentives. A reward such as official recognition or sponsorship for further ICT in education training could act as a good motivator to younger teachers.

Based on the findings of this study, it can be concluded that the environment for integrating ICTs in teaching and learning is good at the school. This is so considering that students' perception and practices regarding this are good, the students are satisfied with the accessibility of ICTs and some students own ICT. On the other side, aspects such as lack of free time to use computers outside formal classroom learning session, prohibition of owning personal ICT tools at school and usage of computers in teaching only computer related subjects appear to be the barriers towards fully integrating the usage of these tools to enhance teaching and learning. In all, the school's efforts to integrate ICT has the most important resource in place; the students' positive attitude towards the whole thing. As explained by Technology Acceptance Model, people's attitude and their limited knowledge of the technology itself lead to fear of technology without any justifiable reasons - technophobia.

**Recommendations**

Despite the presence of the ICT policy in Uganda, there are some government directives and people's mind sets that limit students' use of ICT devices in secondary schools. The, policy planners and curriculum developers in the ministry of education, researchers and private organizations I with interest in students' use of ICT should promote ICT literacy in secondary schools intending to use it as a tool for teaching and learning so as to transform the existing mind set and unfriendly regulations. Further, the researchers recommend that the present study, which was confined to one secondary school in Bulambuli district, should be replicated on a bigger scale to produce results that can be generalized.

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