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INTEGRATION OF ICT TOOLS ON STUDENTS' ACADEMIC PERFORMANCE IN PUBLIC SECONDARY SCHOOLS IN RWANDA CASE OF GATSIBO DISTRICT.

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Abstract : The ambition behind this research project is to investigate the influence of ICT tools on the learning of students in selected secondary schools in Gatsibo, Rwanda. This study has been directed with specific objectives below; To evaluate the knowledge and skills of secondary school teachers and students in the Gatsibo region in using ICT tools, to analyze the performance of public secondary school students in Gatsibo district achieved through the use of ICT tools in learning and also to measure the relationship between ICT tools and the academic performance of public secondary school students in Gatsibo. A simple and descriptive research strategy was applied under this study. The study collected data from a population sample of 23,439 people, of whom 1,323 were teachers and 22,116 were secondary school students. The sample size of this research is 393 people, including 371 students and 22 teachers. Collected data was examined using SPSS and MS Excel and then transformed into readable and interpretable text to explain the study discoveries. In addition, survey results showed that 334 people (85% of respondents) stated that their school had at least one or more ICT tools, while 59 (15% of respondents) believed that their school did not have ICT equipment. The researchers used the logit model to examine the effects of the study. Three (3) of the four variables used in the model are significant and all are significant for the study. The results show that the overall fitness of the model is shown by 0.848 R-squared or approximately 84.8% of overall fluctuation in the dependent factor is described by the explanatory variables. Coefficients showed that availability, adequacy, accessibility of ICT tools as well as user ability to use ICT resources tools are directly related to academic performance. This study proposes proper government planning for using and developing ICT facilities and enhancing the leadership of ICT centers and partners in using ICT tools in secondary schools.

Keywords: ICT tools, Integration, Academic performance

CHAPTER ONE: INTRODUCTION

1.Introduction

This research want to show the impact of ICT tools use on students' academic performance in public secondary schools of in Rwanda especially in Gatsibo district through by assessing the level of integration of ICT tools, by establishing the influence of ICT tools usage and by establishing the influence of ICT tools usage on academic performance of students. ICT is a wide and comprehensive term. It is not limited to Internet or computers. It varies from using radios to using satellites for communication (UNESCO, 2002). The internet, smartphones, personal computers plus other ICT devices have changed our world, work, personal lives and how we manage our knowledge, time and actions. Using just a few clicks, we can email or chat with friends and colleagues around the world, organize our finances, search our courses and even check the home library for research (Ammar & Fahad , 2013). The application of ICT in education is categorized into two i.e.: the concept of ICT for Education & and the concept of ICT in Education. Regarding ICT for education, it refers to information and communication technologies specifically designed for teaching, whereas ICT in education includes the basics of ICT use in teaching. ICTs have revolutionized education to enable students access information anytime and anywhere. It is also related to the distribution of knowledge and how students learn (Bindu , 2016).

The wealth and power of information-age countries increasingly depend on how they acquire, create and manage knowledge and information, it is vital to add access to ICTs – that is, the process, indeed, along with knowledge and skills of a country's economy, politics, and education.

There is a technical gap between rich and poor, knowledge and experience are frequently denoted as the digital divide (Chen & Wellman, 2004). In case of continuous digital divide in today's global economies, people in countries, which are still developing, will suffer, as they will not be able to access data, information, and information from ICT sources.

In East Africa, a digital divide in the education system of less developed countries is hindered by the lack of ICT equipment in schools (Uzunbolyu & Tuncay, 2010). As schools in developing states lack or use ICT resources poorly, the excellence of student learning is at risk of student investment and return on social investment (Kozma, McGhee, Quellmalz, & Zalles, 2004). Students and their families in China devote much of their limited resources to education in the hopes of acquiring knowledge and skills needed to succeed in their careers. When schools do not use ICT resources effectively, students will be short of personal competitiveness (Busch, 2011) and students will not get from knowing how to use ICT resources to boost their lifelong learning because ICT rises their acquaintance with information and knowledge. ICT policy development in East African countries such as Kenya dates back to the 1980s.

In Rwanda, according to the Ministry of Youth and ICT (2012), the Rwandan government initiated and promoted PCs usage and other ICT systems in teaching and learning after the 1994 genocide against Tutsis. The régime also established the National Information and Communication Infrastructure, tasked with overseeing the development of ICT between 2001 and 2005.

The government also made ICT a subject in the school curriculum in 2007. This allowed students to devote at least two hours a week to learning ICT skills (Rubagiza, 2011). A notable example is the One Notebook for Every Child Program (OLPC), which is supported by the Rwandan government to enhance the dissemination of educational content, classroom teaching, and community education and training institutions.

1.1. Specific objectives:

The following are specific objectives guided the study:

- (i) Assessing the level of integration of ICT tools in selected public secondary schools located in Gatsibo district.
- (ii) Establishing the academic performance of public secondary school students in Gatsibo district that due to the use of ICT tools.
- (iii) Establishing the influence of ICT tools usage on academic performance of public secondary school students in Gatsibo district.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

2.1 Empirical Review

2.2.1. Concept of ICT

Until now there is no consensus on the meaning of ICT as technologies are developed almost every day. ICT equipment in this research includes PCs, desktop, projectors, iPods, fax machines, Palm devices, laptops, printers, computers, the Internet & mobile phones (UNESCO, 2002). It involves the ability to use the technology as a tool for information research, measurement and communication. As stated by the World Bank (2002), its broad meaning includes any device that can store, store, manage, transmit, or receive electronic data in digital form. However, despite the important role that computers and their applications play in up-to-date information and communication systems, ICT is largely considered as computers and computer-related activities (Dushimimana & Hesbon, 2020).

(Toomey, 2001) thinks that ICT includes software, hardware, and internet connections, among which IT is a crucial component. (Toomey, 2001) trusts that ICT broadly encompasses electronic technology, online technology, and computer technology, including use of CD-ROMs, computers and websites among vital factors of ICT as the computer is used in tutoring that's crucial to this study.

2.2.2. Concept of ICT integration in education

Integration of ICT in education means the use of computer-grounded communication in day-to-day teaching process in the schoolroom. Teachers are important in ICT tools usage in the classroom today as students prepare for the current digital age. This is because ICT can deliver an active and strong teaching atmosphere (Arnseth & Hatlevik, 2012). While the purpose of ICT integration is to improve the efficiency and effectiveness of the teaching offered to scholars, it is also related to the results of the communication of the academic community in meeting the trials of the world (Albirini, 2006). The process of using information and communication technologies is not a single step, but a continuous step necessary to backup knowledge, teaching & learning (Young, 2003).

Incorporation of ICT tools into teaching & learning is largely related to the teaching of know-how about technology use in school education. The matter of ICT integration in schools, especially in classrooms, is important because students know how to use ICT and learn well in environmental technology. It is a fact that technology use in education has a positive impact on education. After all, the use of ICT will lead to effective learning with the help and support of ICT content and products (Jamieson, Albion, Finger, Cavanagh, & Grimbeek, 2013). Presumably, almost any subject from foremost fields for instance languages, humanities, math, science and arts can be learned best with technology and tools.

ICT tools are used in various ways to help teachers and students comprehend what they are learning. Teaching & learning based on technology partakes various methods to facilitate study, including instructional videos, stimuli, information storage, reference materials, mind mapping, visualization, Interpretation, music, that makes the learning process extra satisfying and meaningful (Finger & Trinidad, 2002). Then again, learners will gain much from the integration of ICT tools, they are not limited to the classroom and limited resources, but the activities in the information in the technology classroom are intended to assist them improve understanding of the subject. Similarly, it helps teachers create creative, effective, and fun lesson plans that support learning. Aforementioned investigations have shown that the use of ICT tools in teaching will improve the learning process and increase students' skills (Finger & Trinidad, 2002).

2.2.3. ICT Integration in Schools

Downes believes that, as the incorporation of ICT into education has got a positive influence on the classroom environment, integration process is complex and can therefore be divided into 4 phases. The 1st stage is introducing ICT as an extra subject in the school curriculum without changing teaching of other subjects. The 2nd level is the ICT introduction in teachers' day-to-day work beyond schoolroom tutoring. The 3rd level is integration of ICT into the classroom so as teachers and learners know how to teach and learn. After reaching this level, the 4th level will be the level where ICT integrates the system to affect the entire school arrangement, as stated (Youssef & Dhamani, 2008).

Gal and Greitz as referred to in (Buda, 2010) stated that the integration of ICT tools into education should be viewed from dissimilar perspectives, with the main perspective being the availability of ICT equipment and appropriate facilities and procedures. (Buda, 2010) emphasized the importance of teachers' attitudes and their willingness to use ICT, because providing ICT tools & infrastructure alone will not help. He added that while teachers should not be experts, they should at least be mindful of the impact of ICT on the subjects they teach and how much ICT tools must be included in teaching their subjects.

2.2.4. ICT Use and Students' Achievement

In their research, (Chandra & Lloyd, 2008) found that ICT use can improve students' learning and performance. However, they added that it will be looked at differently. (Youssef & Dhamani, 2008) conceived ICT tools to have a constructive impact on the teaching procedure since it offers many opportunities to students and teachers. They again agreed that there are mixed views about connection between ICT use and student achievement. (Aristovnik, 2012) found the impact of ICT on education to be different and concluded that most European countries are more capable to improve education and outcomes and benefit teaching by better use of ICT tools.

2.2.5. ICT tools Integration Challenges in education

(Alazam, Bakar, Hamzah, & Asmiran, 2012a) Assessed numerous reviews and concluded that ICT use in the classroom is a changing process that relies on various factors that involve teachers' willingness, their attitudes, backing from administration, accessibility of suitable software, hardware, related equipment, and infrastructure. They also pointed out that ICT develops students and it has become an important part of education in countries around the world, whether taught as a subject or directly integrated into classrooms. Understanding by using Information and Communication Technologies Difficult concepts in various disciplines are made easy to understand at the motivation level.

(Almakani & Williams, 2012) identified various aspects of teachers such as: Organizational/management factors like lack of capacity and confidence, poor attitude and absence of time, quality training, local backup, and leadership are still problems for the use of a decent ICT strategy. Poor planning, lack of funding, and social norms are the main external factors hindering ICT classroom teaching.

2.2.6. Administrative and Technical Support

As long as teachers are given the right software, technical support, and hardware, it may appear that proper training alone is not adequate enough to effectively integrate ICT tools into education. (Bauer & Kenton, 2005) found that even computer-literate teachers do not regularly practice ICT notions in teaching. One of the most important reasons for this is that teachers need more time to prepare lessons. The lack of suitable software and programs and outdated hardware is considered a constraint for ICT in education. (Almekhlafi & Almeqdadi, 2010) identified poor management, nonexistence of appropriate support, and absence of computers in the classroom as key blockages to integrating ICT into the classroom.

2.2.7. Teachers' Attitudes towards ICT Use

(Tezci, 2010) thinks that it's not only the distribution of classroom materials, the purchase of software, and the training of teachers, but also the effective use of ICT, which has a thing to do with teachers' use of ICT tools schools. He added that computer hard and software as well as other devices have no educational value in themselves unless they are used efficiently, effectively, and innovatively.

(Tondeur, Van Braak, & Valcke, 2008) stated instructors' views on whether they use ICT depend on other issues such as knowledge and experience on ICT tools, how well they use ICT in the Knowledge Area, as well as their attitudes while Using ICT knowledge (as cited in (Tezci, 2010)).

2.2.8. ICT in Rwanda's Education

For Rwanda, a country in sub-Saharan Africa, the National Education ICT Policy is part of the education reform the country has been carrying out from 1994. In Rwanda, 1994 is best known by the genocide that destroyed the country and murdered over a million people, it was the beginning of a new era with many changes in many countries, including education. Reforms in education are often based on the idea of universal access to fair and quality education and ICT is expected to be a key force. One of the goals of Rwanda's education policy is the need to "promote programs and activities that make the most of ICT in providing learning and quality education" (MINEDUC, 2013). This importance was reflected in various official documents with the launch of 2020, whose main goal from the early 2000s was converting the Rwandan economy from an Agri-based to a knowledge-based economy, and the country's vision for 2020, which was to transform it into an informative nation and a middle-income state. There is a solid link between ICT in the country's societal and economic development goals and vision, education policy, and different operational programs, plans or initiatives (Twagilimana & Mannikko, 2017).

2.2. Theoretical Framework

2.1.2A review on the integration of ICT tools into teaching

Given the importance of ICT integration in teaching, among the major aims of research on ICT integration in teaching is to identify conditions that can be modified to be effective for ICT integration in teaching. Various theories can be considered while providing the results regarding integration of ICT into teaching. Among the theories, this article examines three viewpoints to identify loopholes for forthcoming investigations. The three concepts include the Theory of Technology Acceptance Model (TAM), the Technology-Organization Environment (TOE) framework and the Unified Theory of Acceptance and Use of Technology. The review is consecutive. To attain this, we look for a thought for a doctrine that we use to express that thought. As noted below, we will find no less than one recent review of literature and a meta-analysis of the theory using it to provide contradictions for the theory's history and future research;

Technology Acceptance Model

(Davis F., 1989) technologically advanced The Technological Acceptance Model (TAM) which uses Actual system use (ASU) as its core variable. Davis describes ASU as monitoring a person's use of a particular resource, like technology as an example. Actual system use is a straight function of the behavioral intention to use (BIU) process, which Davis describes as the degree of individual's desire to perform or not perform a particular conduct in the future. In turn, BIU is responsible for the user interface (ATU) and perceived usefulness (PU).

ATU is a person's positive or negative feelings about achieving a behavior, whereas PU is the degree to which a person certain using an activity will improve their performance (Davis F., 1989). Perceived Usefulness, known as (PU), is inclined by perceived ease of use (PEU), which Davis defined to be the degree to which a person trusts that using a particular technology would be free from effort. PU and PEU determine ATU.

The Unified Theory of Acceptance and Use of Technology

Venkatesh, 2003 discovered the Unified Theory of Acceptance and Use of Technology (UTAUT). The theory has used behavior (UB) as the core variable, which Venkatesh et al. defined as the degree to which a person admits and uses new technology. UB is a function of behavioral intention (BI) and facilitating conditions (FC). While BI measures the strength of an individual's purpose to implement a particular behavior (Davis et al., 1989), FC is the individual's degree of belief that the infrastructure and organization are appropriate to support the behavior (Venkatesh, Morris, Davis, & Davis, 2003).

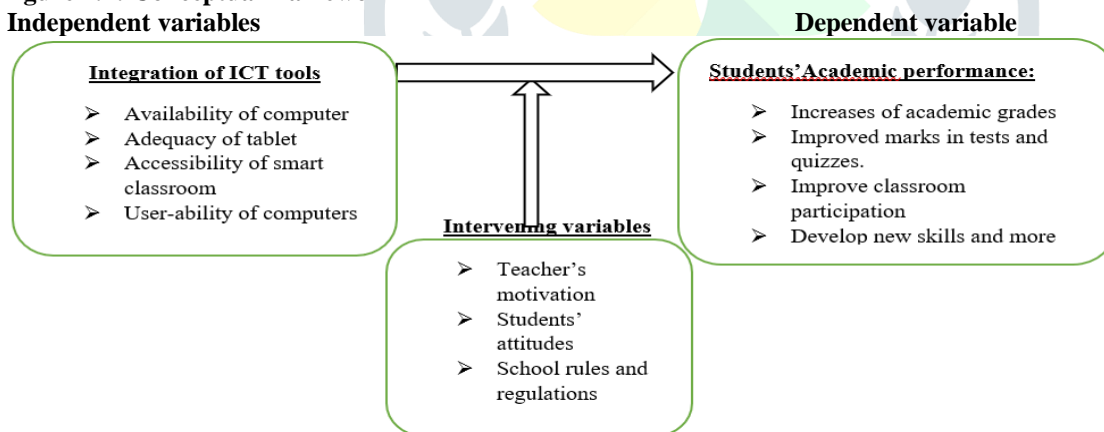
In turn, performance expectancy (PE), social influence (SI) & effort expectancy (EE) determine BI. Venkatesh, 2003 demarcated PE as the degree to which a person trusts that using technology will help them gain employment advantages like effort expectancy as the level of ease of use associated with technology and the extent a person considers SI important that others think they should use technology.

The impact on behavioral intention due to performance expectancy was influenced by gender and age, while the impact on behavioral intention due to effort expectancy was influenced by gender, age, and personal experience. Knowledge is the knowledge that a person acquires using certain tools. The effect on BI due to SI was analyzed by gender, age, knowledge, and willingness to use it. Voluntary use refers to the extent at which an individual perceives technology use voluntarily (Venkatesh, 2003). The straightforward impact on UB because of FC is measured by the experience & age of the person using the technology in question. More than a few investigators have studied the grand-analyses of the UTAUT framework. For instance, Chen & Williams (2011) led a grand analysis of 43 religious' studies on the UTAUT framework obtained from the Web of Science database. Therefore, In all the studies they reviewed, PE showed a positive association with behavioral intention, tailed by SI, EE, and FC.

2.3. Conceptual Framework

The study followed relationship between the variables in the research question. The framework examine influence of ICT on academic performance.

Figure 2.1: Conceptual framework



Source: Researcher compilation(2024)

CHAPTER THREE RESEARCH METHODOLOGY

3.1 Research design

The study employed both quantitative and descriptive survey design. This study concentrated on description and discovering the degree of quantitative association between some of the variables which are involved in the teaching and learning process on ICT tool use and students' academic performance in public secondary schools in Gatsibo district, Rwanda through the views of the students. In this context, purposive sampling was assumed fit to investigate the phenomena.

3.2. Target population

Regarding this study, target population is 22,116 students and 1,323 teachers from public secondary schools of Gatsibo districts as indicated in EICV 5.

3.3. Sample size

The method of TALO YAMANE (1967) was applied to fix the representative sample size from the whole population of 23439. This number is not stable, change changes due to different factors such as dropouts and season among others. Therefore 5% was used as a sampling error.

$$n = N / (1 + N(e)^2) \quad \text{where, } n: \text{sample } N: \text{population } (e): \text{ sampling error} = 5\%$$

$$\text{hence } n = \frac{23439}{1 + 23439(0.05)^2} \quad n = 393.3$$

The sampling size of 393 respondents was sampled in our study including 371 students and 22 teachers.

Sampling technique

The schools of the study were selected purposefully by considering those schools which have more students using ICT in academic processes while learners were carefully chosen by means of simple random sampling procedures.

3.3 Data collection Methods and Analysis [procedures

Data collection methods

Researcher sent the questionnaires to the respondent's office and other places available to the respondent. Which helps researcher to get deeper answers. The researcher use interview for some teachers and the principals of the selected schools.

The research also use documentation Through reading textbooks provided that contain several related literature, various reports, and journals with information connected to role of ICT in education.

To ensure the validity, questionnaire formulated in simple English language for ease of response and with specific and straightforward that help to avoid any bias and errors. To authenticate the instruments, professionals in educational research detested the validity test after data discussion with the supervisor.

The validity was also tested by using Content Validity Index (CVI).

$$CVI = \frac{RQ}{TQ} \geq 0.6 \text{ Where :RQ: Relevant Question TQ: Total Questions}$$

If the estimated content validity index of the questionnaire is more than 0., the questionnaire will be valid in providing the researcher with the information they require.

CHAPTER 4: RESEARCH FINDINGS AND DISCUSSION

4.1 Research Findings

4.1.1 Socio-demographic characteristics of the participants

Table1 below presents the findings regarding the socio-demographic characteristics of the respondents. The results regarding the age of the respondents show that 19.1% of the age distribution is under 16 years old, 45.3% is between 16-18 years old and 35.6% is over 18 years old. The above age indicates the maturity of the respondents and their ability to give appropriate answers to questions. The wider age range also reflects the wider range of people captured in the survey. This should result in the elimination of age group bias, resulting in more representatives being viewed with greater confidence. According to the gender distribution of the respondents, the male answer was 65.1%, and the female answer was 34%.

This indicates that male responses are more associated with decision-making than female responses. Most of the respondent students (23.7%) were in senior five (S5), 19.4% were in senior four (S4), 15.1% were in senior six (S6), S2 had 14.5% as well, while 13.8% and 13.5% of respondents were from senior one and three (S1 and S3) respectively. The distribution thus indicates that education level of respondents may have influenced their level of awareness as to how best ICT tools can improve their academic performance.

Table 4. 1 Socio-Demographic Characteristics of the Participants

Variable	Frequency	Percentage
Age		
Less than 16	75	19.1
Between 16-18	178	45.3
Above 18	140	35.6
Total	393	100.0
Gender		
Male	256	65.1
Female	137	34.9
Total	393	100.0
Educational level		
Students:		
S1	51	13.8
S2	54	14.5
S3	50	13.5
S4	72	19.4
S5	88	23.7
S6	56	15.1
Total	371	100.0
Teachers:		
A'1	5	22.7
A'0	17	77.3
Total	22	100.0

Source: Researcher (2024)

Regarding the level of education of respondent teachers, 77.3% of them completed their bachelor's degree (A'0) well as 22.7% of them had (A'1) diplomas as shown in table1 above.

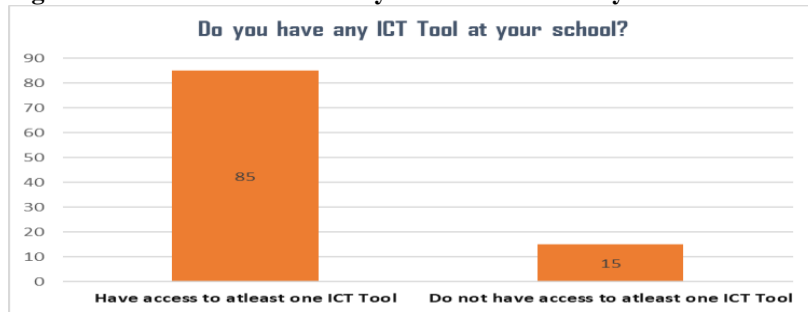
Presentation Of Findings

In the quest for data concerning the incorporation of information technology tools on learners' academic performance in public secondary schools, the researcher posed many questions in line with research objectives to the respondents as observed and analyzed below.

4.1.2 ICT Tools And Facilities Availability In Public Secondary Schools

The research sought to find out whether public secondary schools had access or not to ICT tools used for academic purposes and results are presented in the figure below.

Figure4.2: ICT Tools Availability In Public Secondary Schools



Source: Researcher(2024)

According to the research findings in figure 4.2, 334 (85% of the respondents) reported having at least one or more ICT tools while 59 (15% of the respondents) were found not having any ICT tools or facilities at their schools as shown in the figure above. This is a good sign showing the rate of ICT tools integration on the student’s academic excellence.

4.1.3The major ICT tools used in public secondary schools of Gatsibo District

Table 4.2: ICT Tools Used in Public Secondary Schools

Available ICT Tools/Facilities	Quantities	percentage(%)
Computers/PC	331	84.2 %
Wireless/ Internet connection	137	34.9 %
Television set	254	64.6 %
Projector	52	13.2 %
Various software	313	79.6 %
Others	28	7.1 %
None available	59	15 %

Source: researcher(2024)

From the study findings as observed in Table 4.2, 84.2% of the respondents were found to have computers/PC at school, wires connection (internet) was reported by 34.9% to be available and 64.6% had Television sets. Only 13.2% had projectors while 79.6% reported having had various software for teaching & learning purposes. Some respondents (7.1%) said they had other ICT tools that are not listed above well as 15% of the respondents said they did not have any ICT tools at their schools.

4.1.4.ICT Skills and Knowledge of Students

This part of the findings clearly shows students’ use of computer based software to accomplish different tasks. Table4.3 shows the results of students' abilities in various computer software.

Table 4.3, ICT Knowledge and Skills of students.

Computer programmes [n=371 students]	I can’t use it	I can use it to a small extent	I can use it well	I can use it very well
Word processing	0 (0.00%)	197 (53.2%)	159 (42.8%)	15 (4%)
Spreadsheets	31 (8.4%)	202 (54.4%)	124 (33.4%)	14 (3.8%)
PowerPoint	45 (12.1%)	281(75.7%)	39 (10.5%)	6 (1.6%)
Video conferencing	258 (69.5%)	97 (26.2%)	11 (3%)	5 (1.3%)
Projectors	252 (67.9%)	109 (29.4%)	2 (0.54%)	8 (2.16%)
Internet and E-mail	12 (3.2%)	54 (14.6%)	118 (31.8%)	187(50.4%)
Graphic editing	179 (48.3%)	107 (28.8%)	83 (22.4%)	2 (0.5%)

Source: Researchers’ computation(2024)

Findings from table 4.3, show that all students (371: 100%) acquired some necessary skills to use at least one type of computer software. The findings also show that all students, even with different abilities, have at least some levels of knowledge and skills required to use Microsoft Word. Nevertheless, the facts of this study show that 8.4% of the research students do not have the necessary skills and knowledge to use data such as MS Excel, 12.1% did not know how PowerPoint is used while a big number of

students (69.5%) lacked competencies to use video conferencing for communication and study purposes. More still, 67.9% of students didn't know how to use projectors, only 3.2% were short of competencies to use E-mail and the Internet for searching materials well as 48.3% did not have abilities to practice graphic editing software. Moreover, The results showed that despite the various computer software knowledge and skills the students possessed, they were willing to use them to facilitate learning. As can be seen from the answers, although there are many ICT tools used for teaching and learning, only computers are receiving a lot of attention while other ICT tools are not often used. These computers are mainly used to teach computer concepts, teach students Microsoft Office suite (Word, Excel, PowerPoint, Publisher and Access), how to create simple websites, and how to use email and the Internet. Perhaps the ICT practice in teaching by teachers can influence students' behavior in learning to use computer software to complete their academic studies.

The overall ability of students to use ICT tools

The general ability of the students to use ICT tools in Gatsibo district showed that most of the students in public secondary schools can use ICT tools. Therefore, the outcomes show that 34% of the participants can use ICT tools without any assistance while 48% can use it with minimal assistance while 18% need a lot of assistance when using ICT tools.

4.1.5. ICT integration level in teaching

This study intended to know the effect of ICT integration on students' learning and teaching. Instructors were asked about the ICT integration into teaching on various subjects. The research results are presented in Table 4 below, showing that 77.3% of teachers use ICT for planning and 63.6% use ICT planning, 54.6% use ICT to prepare teaching materials, 59.1% use ICT to prepare student materials, 86.4% use ICT to teach students in the classroom and 72.7% use female student materials. uses ICT to prepare. This research reveals incorporation of ICT tools into school teaching is very high and the least amount of teaching materials is the preparation (54.6%). However, as shown in Table 4 below, ICT is most integrated into the classroom teaching students (84.4%) and preparing ICT teaching materials (54.6%)

Table 4.4: Descriptive Data of ICT tools Integration in teaching.

Area of ICT Integration	Percent (%)	
	YES	NO
Timetable preparation	77.3	22.7
Preparation of schemes of work	63.6	36.4
Classroom student teaching	86.4	13.6
Students' progress reports	59.1	40.9
Students' records	72.7	27.3
Others Instructional materials	54.6	45.4

Source: researcher(2024)

The table 4.4, shows ICT tools integration of in the teaching of public secondary schools is important and can improve the learning of students in the Gatsibo.

Table 4.5: Correlation of selected independent variables

Independent variables	Collinearity Statistics	
	Tolerance	VIF
Availability	0.657	1.521
Accessibility	0.673	1.487
Adequacy	0.462	2.166
Ability	0.475	2.104

Source: researcher(2024)

From the results in Table 4.5, none of the variables has a VIF greater than 4. More still, none of the variables has a tolerance of less than 0.25. This is a clear sign of no correlation among selected independent a fact that they are all considered fit to be used in the model and none needs to be dropped as no variable is having a VIF of 4 and above.

4.1.6. The relationship between the use of ICT tools and academic performance of secondary school students in public schools

While analyzing the influence of ICT tools use on students' academic performance, ICT tools-related factors affecting Academic performance in Public secondary schools were assessed by Binary Logistic Regression analysis. Statistically important variables only were highlighted in the model. The Nagelkerke R Squared value indicates how well the regression model fits. Nagelkerke R squared value is 0.848 or 84.8%, it indicates that the probability of improving or not improving students' academic performance

can be explained by the factors (Availability of ICT tools, Adequacy of IT tools, Accessibility of IT tools, and User ability to use IT tools) affecting Students' academic performance in secondary public schools at a rate of 84.8%. The estimation results from the logit model. The dependent variable is "Academic Performance". The coefficients reported in the table above represent the change in Academic performance with regard to unit variation in the independent continuous variables. The researcher used the logit model to identify factors influencing Academic performance. In the model, three (3) out of four variables used were statistically significant and all influence Academic performance.

Table 4.6: Results from Logit regression analysis

Model (independent variables)	B	S.E.	Sig. (P value)	Exp(B)
Availability of ICT tools	20.693	5170.151	0.997	969988447.337
Accessibility of ICT tools	2.139	0.678	0.002*	0.118
Adequacy of ICT tools	1.931	0.751	0.010*	6.894
Ability to use ICT tools	4.748	0.697	0.000*	115.353
Constant	-21.247	5170.151	0.997	0.000

R square=0.848, * Represent significance at a 5% level of significance

R square=0.848, * Represent significance at a 5% level of significance

Source: Researcher(2024)

The result from Table 4.6 confirms a solid positive relationship between ICT tools integration and Academic performance as the general fitness of the model shown by the value of R square (0.848) is high explaining about 84.8% of total variations in the dependent variable. Coefficients showed that Accessibility of ICT tools ($p\text{-value}=0.002$), Adequacy of ICT tools ($p\text{-value}=0.010$), and User ability to use ICT tools ($p\text{-value}=0.000$) have a direct positive relationship with Academic performance and are significant at five percent level of significance since they have $p\text{-value}<0.05$. Alternatively, the Availability of ICT tools was found insignificant since it has $p\text{-values}>0.05$ at a 5 percent level of significance meaning that it has less influence on total variations in the dependent variable.

Concerning results above, it is clear the ICT tools incorporation into the teaching process has got a positive effect on students' learning. Building on study results, the research concluded that the integration of ICT tools into education has a helpful effect on the learning of public secondary school students in Gatsibo.

Respondents' Views on Barriers to Effective Integration of ICT Tools

During the field survey, it was reported by the respondents that not setting proper Government policies and regulations blocks the effective integration of ICT tools. This is also reflected in the suggestions of 34.1% of respondents who had suggested developing proper Government policy and regulation efficiently to maximize the actual integration of ICT tools. School leadership and structure whereas the next important suggestion by 26.7% of respondents followed by the suggestions of 21.4% and 17.8% of the respondents who suggested Nature and attitude of students & Others barriers respectively to be the key barriers to effective integration of ICT tools.

4.2. Discussions

4.2.1. The level of integration of ICT tools

According to the research findings, 334 (85% of the respondents) reported having at least one or more ICT apparatuses in their schools while 59 (15% of the respondents) were found not having any ICT tools or facilities at their schools as shown in the figure above. More still, most students in public secondary schools can use ICT tools that the outcomes indicate that 34% of the participants can use ICT tools without any assistance while 48% can use them with minimal assistance while only 18% need a lot of assistance when using ICT tools. This is a good sign showing the rate of ICT tools integration on students' academic performance was not sufficient in education. Under this study, results shown that regarding respondents' ages, respondents with ages less than 16 years accounted for 19.1% of the age distribution, 45.3% of who responded were ranging in the age of 16 to 18 years and 35.6% were above 18 years of age. The gender dispersal of the respondents showed that male respondents had 65.1% and female respondents 34.9%. This showed that male respondents participate in ICT decisions more than their female counterparts do

4.2.1 Academic performance of students in public secondary schools

In order to improve the quality of teaching and learning process, the Rwandan government has implemented several initiatives, such as the establishment of ICT policies in education, the provision of technological tools in some schools, such as computers, projectors, Internet connection and teacher training in integration of ICT in education all subjects; and the competency-based curriculum (CBC). Despite these interventions, high school students, those in Gatsibo district inclusive, continue to show poor classroom academic performance.

According to quality education enhancement awareness campaign phase II, numerous teachers in visited schools including those of Gatsibo District showed weaknesses in pedagogical aspects. The results of the campaign revealed that many teachers did not prepare well their pedagogical documents, did not carry out assessment and evaluation (MINEDUC, 2019). The successful combination of ICT tools and resource acquisition and the capabilities to use these resources can provide schools with a critical competency that can benefit student learning.

The relationship between ICT tools usage and academic performance of public schools

Academic performances in Public secondary schools were assessed by Binary Logistic Regression analysis. Statistically important variables only were highlighted in the model. The Nagelkerke R Squared value indicates how well the regression model fits, is 0.848 or 84.8%, which indicates that the probability of improving or not improving students' academic performance can be explained by the factors (Availability of ICT tools, Adequacy of IT tools, Accessibility of IT tools, and User ability to use IT tools) in addition, Coefficients showed that Accessibility of ICT tools ($p\text{-value}=0.002$), Adequacy of ICT tools ($p\text{-value}=0.010$), and User

ability to use ICT tools (p -value=0.000) have a direct positive relationship with Academic performance and are significant at five percent level of significance since they have p -value<0.05. This means that the more ICT tools use in teaching and learning the more academics performance improved.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

From the study findings, the relationship between ICT tools and academic performance is very strong the more ICT tools used the more academic performance is improved in terms students' grade, Improved marks in tests and quizzes and Improve classroom participation. The schools which have school management committee that strengthens Integration of ICT tools by making Availability of computer, Adequacy of tablet, Accessibility of smart classroom and User-ability of computers. That school has a good output product of students at labor market where technology is used mostly. Which is important to development of a country but also for a continent.

5.2. Recommendations

The study showed that respondents indicated improper Government policy & regulations as well as School leadership and structures being a barrier to effective integration of ICT tools in public secondary schools. Such a high magnitude is a matter of concern. The efforts is need to be put in place by stakeholders to curb such barriers by adopting appropriate measures.

The study also recommends proper government planning for the use and improvement of ICT tools by establishing an ICT committee for each school to support, motivate, and assess the use of ICT tools in public secondary schools.

Furthermore, the study also recommends focusing special attention on improving leadership capabilities among school principals and ICT centers managers/coordinators if effective integration of ICT tools in public secondary schools is to be achieved.

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