ICT integration in teaching and learning: perceptions and practices of secondary school students in Tanzania

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Abstract

The study examined perceptions and practices of students regarding the use of Information and Communication Technology (ICT) in teaching and learning at a public secondary school in Ilala district in Tanzania. Specifically, the study focused on assessing secondary school students' ICT related knowledge and skills in Ilala district, finding out how secondary school students in Ilala district use ICT facilities in learning, and gathering opinions and views of secondary school students in Ilala district on ICT integration in teaching and learning. The study used a combination of qualitative and quantitative approaches under a case study design to gather data through focus group discussion (FGD) and questionnaire survey methods from students at the respective school. The study involved twenty five (25) students selected through simple random sampling, who were provided with a questionnaire to respond to, and ten (10) FGD participants purposively selected. The study used thematic and descriptive techniques to process qualitative and quantitative data respectively. The study findings have revealed positive students' perception towards ICT integration in teaching and learning. The students have also demonstrated to have knowledge and skills for using different ICT tools including desktop computers, laptops, Smartphones, Smart boards and iPads. However, the students reported to be provided with insufficient time to spend on computer programmes, they were banned from bringing personal ICT devices to school and that ICT devices usage was only limited to learning computer course instead of being used in all subjects. The study recommends that the secondary school administration should change unfriendly rules, which limit students from using personal ICT facilities in teaching and learning. ICT user education should be provided to public schools in response to the negative mind set on students' use of ICT for learning.

Keywords: ICT in learning, secondary school, educational media, student perceptions, Tanzania.

Introduction

Schools have the responsibility of preparing learners for their current and future lives in the information society. Teachers, in particular, have a vital role to play in ensuring that students are placed in environments that will facilitate their acquisition of skills to do with effective searching, organizing, and using of information from different sources (Gilakjani, 2017). Such a role includes proper integration of technology so as to close the "digital divide" existing between

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users that have access to technology and those that do not (Puentedura, 2013). Digital divide manifests itself among Information and Communication Technology (ICT) users in many ways depending on their levels of ICT literacy. In this case, ICT refers to the means of accessing, retrieving, displaying and storing information through internet, wireless networks, cell phones, and other communication media (Canton & Danowski, 2015). Technology integration is defined as the art and craft of using technologies in classrooms to effectively accomplish teaching and learning tasks (Gilakjani, 2017). To ensure this is possible, students need to be supported in various ways including making them ICT literate and supplying them with necessary technological resources (including radio, television, mobile phones, interactive whiteboards, tablets, computer and internet). Doing so is likely to improve students' academic performance.

Technology has become the knowledge transfer highway in most countries. Through integrating various technologies in different walks of life, societies are able to implement innovations that are transforming the way people think, work, and live (Grabe & Grabe, 2007). As advised by the national ICT Policy (Ministry of Works, Transport and Communication, 2016), schools and other education institutions responsible for preparing students for lives in the "knowledge society" need to integrate ICT in teaching and learning (Ghavifekr, Afshari, & Amla, 2012). Teachers are considered to be at the centre of ICT integration in teaching and learning activities because they are the ones to use ICT tools in classrooms to create more dynamic and proactive teaching and learning environments that enhance learning in this new era (Arnseth & Hatlevik, 2010).

However, successful integration of ICTs in teaching and learning does not entirely rely on the role teachers can play. Rather, questions such as the following have to be asked: Do students have knowledge and skills needed to use ICT facilities? Are students learning ICT skills based on teachers' teaching aids? What are students' feelings about their teachers' application of ICT tools in teaching? Are students motivated to learn through or from ICTs? Which ICT facilities can heavily contribute to students' effective learning? These questions help to examine if teachers' use of ICT influences students' attitude towards learning about ICT facilities and their eventual use in their daily learning activities. For this to be ascertained, a study to investigate students' perceptions of and practices regarding teachers' integration of ICT in teaching and learning was imperative. Thus, this study was carried out with the intention of examining secondary school students' perception of and practices regarding ICT integration in teaching and learning in Tanzania. The following objectives guided the study: 1. to assess secondary school students' ICT related knowledge and skills in Ilala district, 2. to find out how secondary school students in Ilala district use ICT facilities in learning, 3. to gather opinions and views of secondary school students in Ilala district on ICT integration in teaching and learning.

Literature review

The early use of ICT in schools in Tanzania can be traced back to years between 1960s and early 1970s when primary and secondary schools were provided with radios to enable students to listen to educational programmes designed by the ministry of education in collaboration with Radio Tanzania. In 2003, the national ICT policy was formulated for the first time emphasizing on the use of a wide range of ICTs; from radios and mobile phones to computers and Internet to meet educational objectives (Ministry of Works, Transport and Communication, 2016). Among

other things, the policy emphasized the integration of ICT subject(s) in school curriculum and the use of ICTs as pedagogical tools in teachers colleges and secondary schools (Ministry of Education and Vocational Training, 2007). As a strategy for integrating ICT in teaching, the policy was first introduced in the country's teachers colleges and later in secondary schools (Kafyulilo, 2015). This was done by the government of Tanzania in collaboration with the Swedish International Development Agency (SIDA) and the International Institute for Communications Development (IICD) so as to equip all college tutors with ICT knowledge and skills. This project began in 2005 when the proposal of E-school and E-learning was developed to enhance students' computer literacy by providing computers and building computer labs in secondary schools (Philemon, et. al., 2006). Thereafter, a number of ICT projects were conducted in the country by IICD in the educational sector (Philemon, Mzee & Jensen, 2006).

A number of studies have discussed models for integrating technology in teaching and learning (Davis, 1989; Koehler, Mishra, karelwik, Shin & Graham, 2014; Puentedura, 2013). Some of the models include Puentedura's (2013) substitution, augmentation, modification and redefinition (SAMR) model; Koehler's *et al.* (2014) Technological Pedagogical Content Knowledge (TPACK) Model; and Davis's (1989) Technology Acceptance Model. These models differ in context and scope of application. According to Puentedura (2013), SAMR model describes four stages of technology integration in teaching and learning. The first stage is substitution. This stage considers technology as a direct tool substitute which cannot bring any functional change. The second stage called augmentation considers technology as a direct tool substitute that can bring functional improvement. The third stage is called modification stage. Under this stage, technology is seen to have the ability to bring significant change a task such as redesigning it. The fourth stage is called redefinition. Under this one, technology is considered to have the ability to create new tasks not previously conceived (Puentedura, 2013). The model's four stages are closely aligned with levels of Bloom's taxonomy of inquiry processes namely remembering, understanding, applying, analysing, synthesizing, evaluating, and creating. However, despite its usefulness in technology integration in classrooms, the model only fits contexts of classrooms rich in technologies such as mobile phones, computers and modern application software. The model does not show how someone can relate learning tasks and technologies, making it difficult for teachers and students to choose tasks that match technologies in school environments.

Another model of such kind is one developed by Koehler, *et al.* (2014) known as Technological Pedagogical Content Knowledge (TPACK). The model explains how technology can be effectively integrated in teaching and learning. According to Koehler, *et al.,* (2014) TPACK model has seven elements including the *technological knowledge* that implies the knowledge of a teacher about technology, specifically the awareness of computer based technologies and the *pedagogical knowledge that* stands for teachers' understanding of various teaching strategies related to classroom management, assessment skills, and classroom environment. Other elements of the models are the *content knowledge* that addresses teachers' information on subject matter such as natural science, physical science, and social science (Koehler, *et al.,* 2014). Whereas, the *technological pedagogical knowledge* explains the teacher understands of technology and how it supports pedagogical principles to address teaching and learning effectively, the *technological content knowledge addresses* the ability of technology to support or communicate subject matter to students effectively (Koehler, *et* al., 2014). Apart from that, there is the *pedagogical content knowledge* that explains teachers' strengths regarding their application of pedagogical principles in communicating subject matter effectively. The last

feature of TPACK is *technological pedagogical content knowledge* which refers to a teacher's knowledge required to harmonize complex relationships between technology, pedagogy, and content knowledge in teaching and learning contexts (Koehler, *et al.*, 2014). TPACK model is first beneficial to teachers in identifying important aspects that can be applied in teaching and learning i.e. technology, content and pedagogy. Second, the model serves as a universal model for lesson preparation because it associates pedagogy, content, and technology. The third benefit is that it takes into account the context that supports the application of technology in teaching. However, TPACK is considered limited to content-specific pedagogies (Koehler, *et al*., 2014), hence, it is mostly applied in science and mathematics subjects than social sciences. In addition, due to its complex nature, TPACK model is difficult to implement in the classroom context because it requires careful planning and preparation of technologies, matching them with the content and establishing a congruent teaching strategy (Koehler, *et al*., 2014).

Davis (1989) developed the Technology Acceptance Model (TAM) informed by information systems theory on how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decisions on the ways and when to use it, notably. These factors are: *Perceived usefulness* which refers to the degree to which a person believes that using a particular system would enhance their job performance; *perceive ease of use* refers to the degree to which a prospective user expects the usage of a system to be free of effort (Davis, 1989). However, the two factors are influenced by external variables which are social, cultural, and political factors. The attitude one has towards the use of a particular system is determined by its evaluation in relation to the perceived ease of use and the outcome of using it (see, Figure 1).

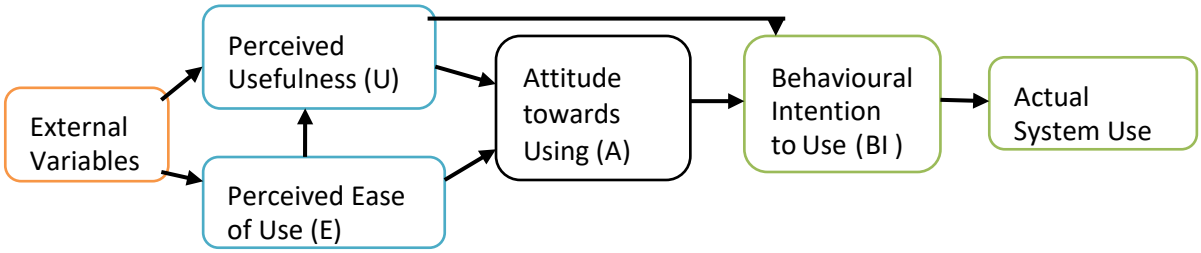

Figure 1: Technology Acceptance Model - (Davis, 1989).

This model constitutes external and internal variables regarding which, in this case, influence teachers' and students' technology integration in teaching and learning. The model is useful in explaining concepts of technology integration in teaching and learning cognizance to contextual factors (Davis, 1989). As such, the researchers have framed this study using this model because they consider it a powerful model for investigating students' perceptions and practices regarding technology use and how technology use influences learning behaviours at school.

Studies on ICT integration have indicated that ICT supports students efforts to harness sensible learning when it is used as a tool of knowledge construction, as medium of accessing knowledge, and as a context of learning by doing and promoting thinking (Khine, 2006). Further, the studies indicate that ICT is used as a social means for promoting cooperative learning and an intellectual partner to help learners express what they know and how they have learned them (Khine, 2006).

According to Mikre (2011), there are several benefits of ICT when integrated in teaching and learning. These include the following: it offers the opportunity for more student-centred teaching and learning, it provides greater opportunity for teacher-to-teacher and student-to-student communication and collaboration, and exposes students to vocational skills and real world experience (Mikre, 2011). In addition, ICT integration in teaching offers teachers and students with opportunities to access new sources of information and apply multiple technologies in teaching, hence creating greater learning enthusiasm among students. Furthermore, ICT provides distance learners with online educational resources to assist them in their resource-based learning environment (Mikre, 2011). According to the Technology Acceptance model, students' understanding of these benefits of an ICT increases its *perceived usefulness* and *ease of use* in teaching and learning purposes.

According to Al-Hariri and Al-Hattami (2017), the most important element that *eases the use* of technology in educational systems is the Internet. Researchers demonstrate that Smartphone applications and the Internet are introducing a new degree of responsiveness and flexibility within education processes. This responsiveness is facilitated by the easiness of technology to which content can be updated, through which instructions can be personalized, from which information can be accessed, and through which information can be distributed and content standardized. Al-Hariri and Al-Hattami's (2017) study that targeted health colleges discovered that technology has a positive impact on our ways of thinking and noted a significant relationship between students' use of technology and their achievements in physiology courses. A study by Ghavifekr and Rosdy (2015) used TAM to determine the effectiveness of ICT integration for students in active learning and its role in the engagement of students in learning experiences. Ghavifekr and Rosdy (2015) revealed that teachers and students agreed that the use of ICT enhances students' academic performance.

On their part, Sung, Chang, and Liu (2016) examined the effect of integrating mobile technological devices in teaching and learning on students' performance. The study's findings indicated a medium-sized effect of the technologies on learning achievements. Precisely, 69.95% of students that used mobile devices performed significantly higher in cognitive related tasks than their colleagues who did not use mobile technological devices. In fact, Sung, Chang and Liu (2016) found that the overall mean effect size for learning achievement in this meta-analysis was 0.523; implying that learning using mobile communication devices is significantly more effective than traditional teaching methods. The effect of such usage was greater for handhelds devices than for laptops. The devices' usage in inquiry-oriented learning was more effective than their usage along with lectures, self-directed study, cooperative learning, and game-based learning. In the study, informal education environments were found more effective than their formal counterparts while medium and short-duration interventions were superior to long-term interventions. In a similar line, Wajszczyk's (2014) study revealed that a number of issues influence behaviour of both teachers and students regarding access to technology and the ability to use it. Furthermore, the study's findings noted that students who used ICT for learning achieved better results than those that had limited ICT support. Thus, Wajszczyk's findings suggested teaching in more informal learning environment to allow students' cooperation and a change in their *behaviour intention* towards using technology for knowledge construction in schools.

Literature gap

Research in Tanzania has showed that the use of ICT as a pedagogical tool in improving the quality of teaching is a critical situation among teachers (Hare, 2007; Yonazi, 2012; Ndibalema, 2014). For instance, Ndibalema (2014) noted that there was little evidence on how successful ICT has been as a pedagogical tool in schools as Hare (2007) discovered that teachers used computers to handle managerial and administrative functions including keeping and typing reports and letters. Moreover, there are several challenges affecting the adoption of technology in classroom teaching and learning activities in the country (Nzilano, 2015; Yonazi, 2012). For example, problems associated with limited ICT skills, ICT awareness and users' mindset towards their use (Yonaz, 2012); poor understanding of technology integration in teaching, lack of practical experience with technology and lack of collaboration among teachers in schools (Kafyulilo, 2015); limited access to ICT facilities due to unreliable electricity and internet services (Nzilano, 2015) hindered the integration of ICT in classrooms.

Furthermore, Yonazi noted that rural populations hardly had computers and skilled personnel in schools, hence the scholars' proposition that the current professional development approach should be evaluated and a new in-service teacher training approach should be introduced (Kafyulilo, 2015; Nzilano, 2015; Yonazi, 2012). This new approach would allow teachers to design new learning experiences in collaborative teams and practice using lessons from their classrooms. In this situation, teachers' integration of ICT facilities in teaching is likely to influence students' behaviour to learn such technology and apply them in learning their subjects. Thus, the present research examined students' feelings, opinions and practices regarding teachers' integration of ICT in teaching and learning in secondary schools in Tanzania.

Methodology

Research approach

A mixed methods study approach was used to examine students' perceptions, opinions, beliefs and practices in relation to ICT integration in teaching and learning in a Tanzanian secondary school in Ilala district, Dar es Salaam. Under this approach, the quantitative part was adopted to gather quantifiable, value free, and objective data to supplement qualitative information. In general, the combination of the two approaches is considered superior to simply banking on one of them (Bauer & Gaskell, 2000). The qualitative approach was preferred because of its capacity to address research problems through sense making and construction of concepts, and interpretation of values and context of the study (Punch & Oancea, 2014). With this strength, qualitative approach was used to examine individuals' perceptions, opinions, beliefs and practices regarding the integration of ICT in teaching and learning in secondary schools.

Research design

The study adopted a case study design to obtain in-depth descriptions and explanations about individuals' behaviours at their secondary school context (Grunbaum, 2007). The case for this study was individuals' perceptions and practices regarding ICT integration in teaching and learning, whereas the unit of analysis was individuals' responses from their secondary school settings (Grunbaum, 2007).

Study area

The study was conducted at one secondary school located in Ilala District in Dar es Salaam city. The area was selected purposively based on the following criteria: it had to be an urban secondary school already integrating ICT in teaching; second, the school had to be one that teaches computing subjects to students and uses computers as aids for learning other subjects. One school (name reserved for ethical issues) met the criteria and was expected to provide rich information of the studied phenomenon.

Population and sampling

The study involved o-level students studying a computing subject at the selected secondary schools. The study used simple random and purposive sampling to obtain 35 students who volunteered to participate in this research. In particular, the study used simple random technique to obtain a representative sample of form I and II students because the school's computing subject was a compulsory one for these classes. In addition, 30 cards labelled 'YES' and 'NO' were prepared and mixed in a box. Only 15 cards were labelled 'YES' and the students who picked them from the box were automatically selected to voluntarily participate in the study. The purposive sampling technique was used to select 10 form III and form IV students who attended classes of optional computer subjects offered to the two classes. In addition, the technique was used to select 10 students by virtue of class leadership position (in form I to IV) to participate in the study. According to Bamora (2010), purposive sampling selects respondents who can provide information that answers research questions. A total of 35 students from the secondary school participated in the study.

Data collection methods

The study used questionnaire and focus group discussion (FGD) methods to collect data. The questionnaire survey method was used to collect quantitative data needed to validate and help in the analysis of data from FGDs. The questionnaire used contained both open-ended and closed questions and got administered to 25 students. Such a mix of questions allowed for the generation of a high quality content. The questions in the questionnaire focused on matters to do with ICTs (radio, television, mobile phones, computer and internet) and the knowledge and computer skills (using Microsoft suite, email and internet etc.) students had. In contrast, FGDs were used to gather data on students' feelings, opinions, and views on the use of ICTs in teaching and learning. The study formed two (2) focus groups made of five (5) members each. These students were those purposively selected for being considered to have information rich on the topic partly because they studied computer subjects and partly because of their leadership merit.

Data analysis

The gathered information was organized based on what were observed, heard and read, to make sense of acquired knowledge (Glesne & Pesken, 1992). For instance, the quantitative data were analysed based on their nature using Microsoft Excel programme and displayed in percentages and graphic forms while the qualitative ones were processed using the Word Processor and

appeared in concepts, quotes and themes. The findings' presentation and discussion were treated simultaneously to allow for reflection on the interplay between literatures, the studied phenomenon, and the researchers' position.

Findings presentation and discussion

The study reports findings on students' ICT knowledge and skills, students' modalities of using ICT facilities in teaching and learning, and students' perceptions regarding ICT integration in teaching and learning at a public secondary school in Ilala district, Tanzania.

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 programmes [n=25]	I can't 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%)

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 programme 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 26th June 2019]

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 findings are similar to what has been reported by previous studies that computers were not used as facilities for teaching in classrooms (Hare, 2007; 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' behaviour 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 programme 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.

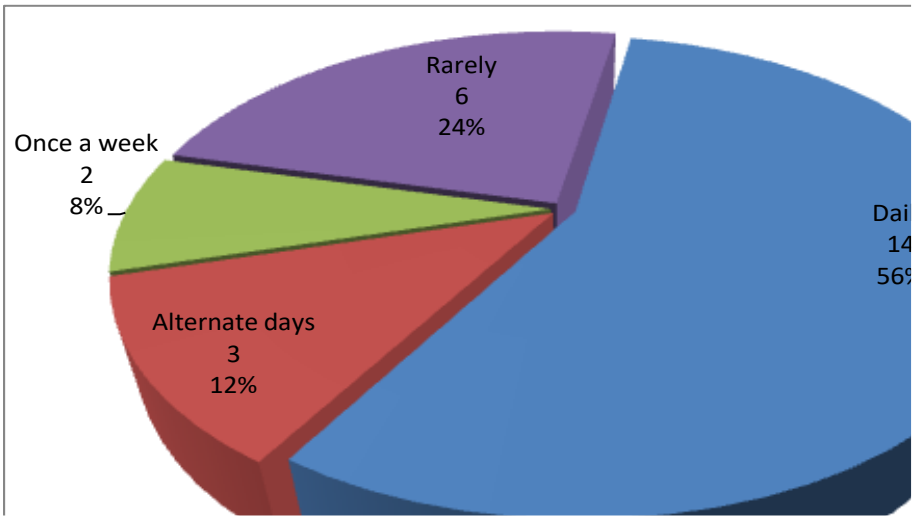

Figure 2: Frequency of students' use of Internet (n=25)

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:

> 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, 2019]

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.

Integration of ICT technologies in teaching and learning

Regarding the usage of computers in classrooms, the results revealed that the use of ICT facilities in teaching and learning at the school differed depending on the type of technology or ICT equipment. In fact, 23 (92%) responses indicated computers as ICT facilities used to teach at the school; 9 (36%) indicated Internet, smart board was indicated by 3 (12%); and television was indicated by 1 (4%) response. Regarding the ownership of such devices, the study has established that majority of students 21 (84%) owned ICT devices such as desktop computers, laptops and tablets while 4 (16%) did not. The study further found that students who owned such ICT devices felt that they were helpful to their efforts to learn various subjects. For example, responses from majority (4:16% plus 10:44% and 9: 36%) students who used internet indicated that it helped them to become more communicative while 1 (4%) student showed to have not benefited from it (see Table 1).

Further, students acknowledged to have acquired some knowledge and skills of using the computer programmes from teachers who taught mathematics using Heymath programme, which enabled them to communicate with fellow students and teachers through the internet. In the mathematics subject, the students could set time to submit an assignment, set remainders and receive feedback from the mathematics teachers on the assignment they attempted. Thus, these findings suggested that there was a change of *behavioural intentions* among students towards use of ICT at the school. These findings appeared to support results from Roberts (2003) study which indicated that when users are aware of the usefulness of the technology they can be willing to apply it to the actual situation. Teachers need to be encouraged to integrate ICT technologies in teaching to change students' behaviour of learning about ICT and learning from ICT resources.

The key thing in these findings is that when teachers use ICT facilities to aid teaching and learning in classroom environment, students are likely to be influenced into developing behavioural intentions to use the facilities in their learning. This change in behaviour may

increase chances of students learning how to use the facilities for other uses. For example, the study reports the findings that 18 (72%) students who became skilful in ICT were able to obtain good grades in tests and examinations while 7(28%) lacked the skills and knowledge needed to use the technologies did not benefit. In addition results reflected in Table 1 indicated different responses of some students who appeared to miss competencies needed to use internet services, PowerPoint and graphic programmes. Commentators in literature have indicated that perceived ease of use tends to influence the use of technology because difficulties faced in using a technology are likely to negatively affect one's behavioural intension to use it and later affect the actual use and acceptance of the technology itself (Davis, 1989). Thus, the students that lack the skills and knowledge needed to use ICTs will find using technologies complicated hence developing unwillingness to use them. As such, the students need enough time and support to learn about the technology.

Students' perceptions of ICT use in teaching and learning

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... [FGD/student 26th June 2019]

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. [FGD/student 26th June 2019]

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. However, while the school administration appeared to allow the use of ICT facilities for teaching and learning, it abides by government directives of prohibiting students from

owning such technology at schools. One would doubt why the school, particularly some teachers are reluctant to report to the school administration or apply the government directives to students who violated it? The school context seem to provide chances for students to have access to personal and ICT facilities while the country norms are not in favour of the strategy. The findings reflect previous studies that have reported on the need for positive student's awareness and mind set towards the use of ICT to motivate student learning environment (Yonazi, 2012).

With regard to the student's motivation to use ICT facilities, the findings show that a majority (18, 72%) of students was satisfied with ICT integration in teaching and learning activities except for a few (7, 28%). Likewise, the students were more motivated to use some forms of ICT tools including smart phones, laptops computer and computer applications than they were to use tablets, iPads, Internet, and smart boards in learning. Figure 3 illustrates the least to the most liked ICT facilities for teaching and learning purpose.

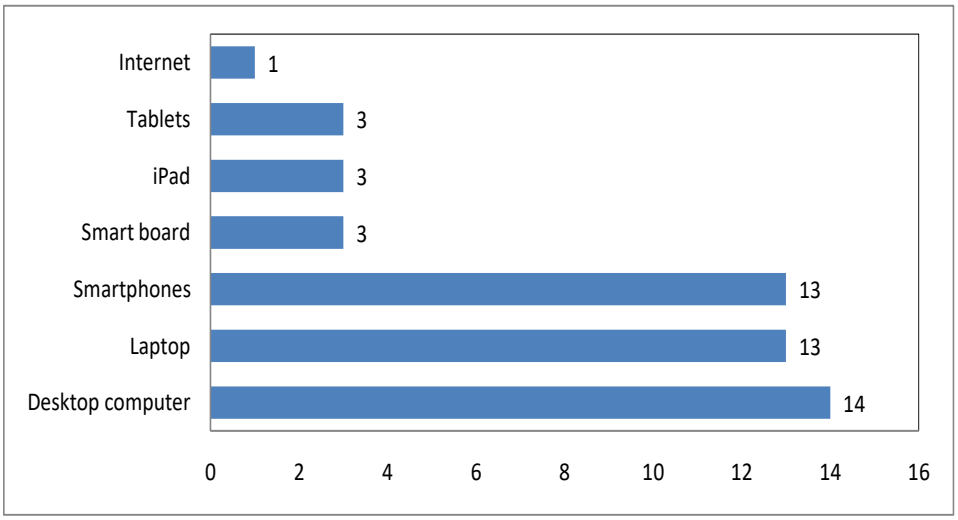

Figure 3: ICT facilities for teaching and learning

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 Smartboard, 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. Moreover, evidence on Technology Acceptance Model reveals that effective ICT integration in teaching promotes active learning and high performance (Ghavifekr & Rosdy, 2015). In fact, TAM predicts a significant relationship between teachers and students acceptance of the use of technology and academic achievement (Al-Hariri & Al-Hattami, 2017). In this regard, the integration of ICT in teaching at this school under study is likely to be positively contributing to better academic performances.

Conclusion

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

In the light of study's findings, the study commends the secondary school for making good progress on the integration of ICT facilities in teaching. However, the school has to extend the use of ICT facilities to teaching other (non-computer) subjects. Since the school has long emphasized on the use of computer technology, there is a need for it to widen its scope of ICT tools to be used in teaching and learning so as to include devices such as smart phones, tablets, television receivers, and smart board because they are flexible and promote interactive teaching and learning. Based on the results, it is also found of great importance for the school's administration to soften the rules that restrict ICT use so as to allow students to use the their personal ICT devices for learning.

Despite the presence of the ICT policy in Tanzania, 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 Ilala district in the city of Dar es Salaam, should be replicated on a bigger scale to produce results that can be generalized.

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