

Extensiveness of Utilization of Computers for Improving Teaching and Learning in Teacher Colleges in Kilimanjaro Region – Tanzania

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Abstract

This study assessed the Extensiveness of Utilization of Computers in Improving Teaching and Learning in Teachers Colleges in Kilimanjaro Region - Tanzania. The study was guided by the Activity Theory by Alexei Nikolaevich Leontyev, and Rubinshtein (1889-1960). A convergent research design under a mixed research methods was employed. The target population was 803 students, 131 tutors, and 7 College principals. Stratified random sampling was used to determine the sample of the study that consisted 124 of respondents. The study used questionnaires, checklist guide, observation guide and interview guide for collecting for data collection that validated by four research experts from the MWECAU faculty of education and Cronbach Alpha was used to ensure reliability. Interview guides were validated by research experts; trustworthiness and triangulation were used for reliability. Quantitative data were analyzed using descriptive statistics and presented by using tables while qualitative data were analyzed using thematic analysis.. The study found that there are inadequate of computers and computer laboratories. The study recommended that college Administrators' and Government should provide more computers and other ICT facilities that should be utilized for improving teaching and learning. Tutors and students are needed to be more equipped in applying computers for teaching and learning.

Keywords: Availability of computers, Utilization, Teaching, Learning, and Teacher colleges

1. Introduction

Teaching is a specialized presentation of knowledge, skills, and attitudes intended to provide unique services to meet the educational needs of the individual and society (Akinrotimi, 2021). Teaching resources, on the other hand, include all of the items required for teaching, such as various types of teaching aids, infrastructural facilities such as the classroom, library, and applicable texts books, as well as other resources especially ICT resources like computers (Amadi et al. 2022). Availability of computer resources is one of the main factors that influence CBI integration in improving teaching and learning, these resources are like desktop computers, laptops, projectors, Televisions and photocopier machines. If these resources are not available in schools, it can prevent the effective use of computers in classrooms (Belay, 2020).

In Tanzania, the use of technology in teacher colleges started in 2005 as a joint venture between MoEVT and the Swedish International Development Agency (SIDA). The main goal was to improve the quality of pre-service and in-service teachers by providing Computers and other ICT facilities for example in Morogoro teachers college was proposed to be the center for offering a training and seminars to the teachers about using technology for teaching (Swarts & Wachira, 2010). The availability of computers could influence flowing of information, promotion of information, and communication. Technology has led to qualitative changes in many aspects of the modern society where there is an expansion and application of computers including in education for teaching and learning (Norris, 2015). The Vision of Tanzania economy 2025, recognizes the role of education as a strategic key for national development and identifies the potential of ICT to address most of the development challenges including those presented in education (Swart & Wachira, 2010). Tanzania through Education Sector Development Program (ESDP) identified the importance of using computers for providing education. However, the availability of technology infrastructures and resources might not be sufficient. This factor may affect its implementation in education. Also, inaccessibility of internal networks may hindered the institution from accessing and interrupt the uses of computers for teaching and learning. Availability of computers includes; accessibility of properly installed computers as per student requirements in sufficient bulk with access to the internet according to a schedule for use at the organization. On the other hand, acceptability depends on ease in computer learning and

use without any fear or threat excitingly and enjoyably. It also includes giving importance to a computer by considering it as a need for educational purposes (Anderson, et al. 2014).

To ensure that there is availability and utilization of computers for teaching and learning Tanzania has developed ICT policies. These entail those different levels of education applying computers for teaching and learning. The Tanzania National Information and Communication Technology (NICT Policy 2003 and ICT Policy for Basic Education 2016) inform that utilization of computers in primary, secondary, and Colleges are stressed. Also, The Education Sector Development Program (ESDP) 2008 – 2017 states that there is a need to strengthen the use of computers in educational institutions for open learning by ensuring the extensiveness of the required facility.

Anderson et al (2014) points out that the computers were available but there was a significant residential difference in acceptability of computers, as urban students had higher acceptability of computers as compared to rural students. In addition, Tanzania's ICT policies of 2003 and 2016 recommend that educational institutions, mostly private have incorporated the use of computers in education delivery. There are various initiatives that the Government in collaboration with other stakeholders takes to make the extensiveness of computers that are utilized in education. In addition, the inadequacy availability of computers and other resources might be the major reason for the slow utilization of computers in instructing teaching and learning in teacher colleges. Computers in teacher colleges are provided by the government and other education stakeholders to make sure that there are adequate number of computers that used for teaching and learning in all teacher colleges (Marcial& Rama, 2015). The utilization of computers may increase autonomy and motivation for students hence influence students development of skills, innovation, and creativity (Joy &Srihari, 2015&Anderson et al., 2014).

Despite the effort made by the government through the permanent secretary of Ministry of Educational Science and Technology (MOEST) of providing ICT facilities in teacher colleges in Tanzania still, there is a problem about the applicability of those facilities in teacher colleges. This raises a question on the availability of utilization of computer-based instruction for improving teaching and learning among teacher colleges in the Kilimanjaro region.

2. Statement of the Problem

The inadequacy and the extensiveness of computer utilization in teaching and learning in teacher colleges has been a point of concern to the educational stakeholders. The use of computers for teaching and learning facilitates an innovation and creativeness for the learners but does not guarantee the extent to which improves teaching and learning. The need for practical learning is important because it opened the room for participation and sharing of ideas in learning and simulated in promoting student success (Thobekani, 2021). Utilization of computers is strategies that employed by tutors and students at colleges for improving teaching and learning.

Studies done by (Magen and Maskit 2016; Okorieocha et al. 2019; Bello 2018; Mohammad, 2021; and Jakwa, 2021) concentrated on availability and utilization of ICT, Availability, Accessibility and Utilization of ICT, availability of teaching aids and appraisal of the utilization of computer based instructional materials.

None of the reviewed studies was done on the Extensiveness of the utilization of Computers in Improving Teaching and Learning. Therefore, the current study assessed the extensiveness of the utilization of computers in improving teaching and learning in teachers' colleges in Kilimanjaro region of Tanzania.

3. Research question

To what extent is the availability and utilization of computers by tutors and students led to the improvement of teaching and learning in teachers' colleges in Kilimanjaro region of Tanzania?

4. Significance of the study

The finding of this study is highly significant to the Ministry of Education Science and Technology by informing us the utilization of computers in educational institutions. Policymakers benefit from the findings of this study by being informed about the extent to which educational and ICT policy were implemented for teaching and learning. Educational stakeholders also benefited from the study by being informed about the contribution of computers for improving teaching and learning due to the interaction room between students and teachers. In addition the findings of this study contributed to the body of knowledge by providing more information on how computers are utilized in teacher colleges.

5. Theoretical Framework

The study was guided by the Activity Theory and ICT in Education developed by Alexei Nikolaevich Leontyev, and Rubinshtein (1889-1960) in Russia. The theory Demonstrates the systematic analysis of events, activities, contents, and teaching pedagogical processes taking place in the context that computers are used for teaching and learning (Demiraslan & Koçak Usluel, 2008). The theory contributes to the study based on the choices of teaching pedagogy that is employed computer. Also, activities that allow interaction during the teaching and learning process as the teacher and students interact with the teaching tools.

Activity Theory (AT) allows tutors and student-teachers in using technology as tools of teaching and learning within the college system which makes the success for goals achievements at both the individual level of the teacher trainee and at a broader level of the organization such as colleges (Murphy & Rodriguez-Manzanares, 2008).

6. Review of Literature

Extensiveness and utilization of computers are strategies employed by tutors and students at colleges in improving teaching and learning. However, when colleges encountered inadequate of computers for teaching and learning becomes severe for college principals acknowledged by tutors to report to the higher authority for further measures (UNESCO, 2016). This informed that computers are used for teaching and learning by tutors and students.

During the review of related studies on the extensiveness and utilization of computers for improving teaching and learning in teacher colleges most of the studies did not consider the utilization of computers in improving teaching and learning. For example, Magen and Maskit (2016) conducted a study in Israel entitled Integrating ICT in Teacher Colleges a Change Process. The purpose of the study was to examine the integration of ICT in a teaching training college in the north of Israel, in the context of a technological-pedagogic setting, the ICT culture in the college, and how educators' metaphorical sensations contribute to their use of ICT tools and to student training in an ICT environment. To achieve this, the study adopted mixed methods with a total of 120 respondents involved in the study, both qualitative and quantitative research approaches in addition case study design were employed. The study used Questionnaire for collecting information from the participants.

The use of questionnaire only for data collection could compromise the validity and reliability of the information since some information like feelings, emotions and behaviour cannot be obtained by using questionnaire. Also, the room for triangulation of the data was not implemented while triangulation of instruments paves away of gathering bulk and more reliable data. This study filled the gap by using questionnaires and interview guide for data collection where the data was triangulated to bring out bulk and reliable information.

The study revealed that problem of classrooms that containing interactive whiteboards and computers are very few, most of teacher colleges have the problems of computer software's that used for preparing materials for presentation. This hindered the process of implementing computer-based instruction for teaching and learning.

Okorieocha et al. (2019) conducted a study in Nigeria about Availability and Utilization of Information and Communication Technology to Enhance Technical Education Program in Technical Colleges: An Implication for National Development. The purpose of this study was to investigate on the availability and utilization of information and communication technology to enhance technical education program in technical colleges for national development. Descriptive survey research design was employed and data were collected using researchers constructed questionnaire.

Three research questions guided the study while three null hypotheses were tested at 0.05 level of significance. Study population was 88 comprised of 64 male and 24 female technical teachers. The research questions were analyzed using descriptive mean and standard deviation while the null hypotheses were tested using Z-test at 0.05 significant level. Three experts from Michael Okpara University of Agriculture, Umudike, Abia State validated the instrument for the study. The findings revealed that ICT facilities like desktop computers, printers, laptop computers are available to very high extent while video recorder, interactive white book are available but to low extent. The study used one data collection method which limits the issue of triangulation and trustworthiness of the data hence not to have bulk information. Current study filled the gap by employing questioners and interview guide for collecting information where triangulation was made using quantitative and qualitative data.

Bello (2018) conducted a study in Nigeria about Availability, Accessibility and Utilization of Information and Communication Technology in Teaching and Learning Islamic Studies in

Colleges of Education, North-Eastern. This study examined availability, accessibility and utilization of ICT in Teaching-Learning Islamic Studies in Colleges of Education, North-East, Nigeria. The study adopted multi-stage sampling technique, in which, five out of the eleven Colleges of Education (both Federal and State owned) were purposively selected for the study. Primary data was drawn from the respondents by the use of questionnaire, interviews and observations.

The results of the study, generally, indicate that the availability and accessibility to ICT facilities in Colleges of Education in North-East, Nigeria, especially in teaching and learning delivery of Islamic studies were relatively inadequate and rare to lecturers and students. The study further reveals that the respondents' level of utilization of ICT is low and only few computer packages and internet services were involved in the ICT utilization, which is yet to reach the real expected situation of the globalization and advancement in the application of ICT if compared to other parts of the world, as far as the teaching and learning of Islamic studies is concerned. The study succeeded to inform the current study about the situation of availability of ICT but still more information is needed about contribution of ICT for improving teaching and learning. Current study filled the gap by contributing more on the effects of computers for improving teaching and learning.

Mohammad (2021) conducted a study about the availability of teaching aids in resource rooms and their use by teachers in Irbid Governorate. This study attempted to find the degree of availability of teaching aids in the resource rooms and the extent to which teachers use them in Irbid Governorate. To achieve the objectives of the study, the researcher used a checklist to determine the availability or non-availability of teaching aids, and a questionnaire to determine the degree of use of these teaching aids.

The study sample consisted of (230) male and female teachers. The study concluded that the following devices were largely available: the recorder, the school radio unit, the radio, the television, the computer, a printer, and a data show device. The following educational materials: blackboard, chalk, book, eraser, pencils, ruler, cardboard, and teacher's guide were widely available. The degree of use of the book, the blackboard, the eraser, the pencils, the chalk, and the ruler came to the highest degree. However, the use of the computer data shows the device had the lowest degree. One instruments used for collecting information where this could hinder

triangulation and hence affects validity and reliability of the findings. This current study filled the gap by employing more instruments such as questionnaire and interview guide hence could allow triangulation and improvement of validity and reliability of the findings.

In Nigeria Jakwa (2021) conducted a study about appraisal of the utilization of computer based instructional materials and strategies for teaching computer studies in Colleges of education in Northeast, Nigeria. This study appraised the availability, utilization and adequate instructional strategy of computerized teaching materials for teaching computer studies courses in Colleges of Education in North East Nigeria. The study adopted survey research. The population of the study constitutes all the Colleges of Education in the North East.

Structured questionnaire was used as instrument for data collection; out of 1200 samples administered 900 were returned back. The study revealed that most of the resources are not available and if available are not in large quantity to be utilized for large group of students. Therefore, the study recommends that, the available computerized teaching materials should be used adequately by grouping the students into batches and the lecturers should have the materials at their disposal to encourage the students to participate in the practical classes.

With regard to the adequate instructional strategies, the National Commission for Colleges of Education (NCCE) should supervise the Colleges regularly to ensure that minimum standards are maintained in the Colleges of Education. The study used one instruments for collecting information, the use of one instrument for collecting information could hinder triangulation of the findings hence validity and reliability of the findings would be questioned. Current study filled the gap by employing appropriate various instruments for collecting information such as questionnaire and interview guide hence there could be triangulation of the findings and improvement of validity and reliability of the findings.

7. Research Methodology

This study employed a convergent design under a mixed research approach; this approach is favourable to this study because the researcher wants to make triangulation of the data. This design is useful hence the researcher collected both quantitative and qualitative data at once. Creswell and Creswell (2018) state that a mixed research approach involves the collection of

both quantitative and qualitative data, integrating the two forms of data, and using distinct designs that may involve philosophical assumptions and theoretical frameworks.

The sample of the study comprised 40 tutors, 80 student-teachers selected by stratified sampling procedure, and 4 college principals who were included in the study directly. Two data collection instruments were employed included questionnaire for collecting quantitative data from tutors and student-teachers and interview guides were used to collect data from college principals.

The quantitative data was validated by research experts and Cronbach's alpha was used to check for reliability. Descriptive statistics were used to analyze the data using frequencies, percentages, and mean scores. The qualitative instrument was validated using research experts; triangulation and trustworthiness were used for reliability. Thematic analysis was used to analyze the qualitative data where themes were developed, relevant information was extracted, interpreted, discussed, and finally presented also direct quotations and transcription were employed.

8. Findings and Discussions

This study results on the extent of availability of utilization of computers by tutors and students for the improvement of teaching and learning in teachers' colleges in the Kilimanjaro region of Tanzania.

The study intended to determine the extent of availability and utilization of Computers for improving teaching and learning in teachers' colleges. The information obtained in the study was about the extent of availability and utilization of computers for improving teaching and learning in teacher colleges. Data of the study was collected from tutors and student teachers using a questionnaire, and from the principals of the colleges using an interview guide. Table 1 presents the responses from tutors about the extent of availability and utilization of computers for improving teaching and learning in teacher colleges.

Table 1

Tutors' Response on the extent of availability and utilization of Computers for improving teaching and learning in teacher colleges(n=40)

S/N	Statement	VLE		LE		M		HE		VHE		Mean
		F	%	f	%	f	%	f	%	F	%	
1.	There are enough computers in my college for teaching and learning	1	2.5	5	12.5	22	55.0	9	22.5	3	7.5	3.20
2.	Computers are personally owned by tutors in my college	9	22.5	11	27.5	10	25.0	7	17.5	3	7.5	2.60
3.	There is computer laboratory in my college	-	-	10	25.0	18	45.0	8	20.0	4	10.0	3.15
4.	The principal provides a computer to you that used for instructing teaching and learning.	12	30.0	6	15.0	8	20.0	11	27.5	3	7.5	2.68
5.	I have experience with student-teachers bringing their computer to the college for learning.	21	52.5	7	17.5	4	10.0	5	12.5	3	7.5	2.05
6.	I brought my personal computers to the college and used them to instruct teaching and learning	9	23.1	2	5.1	7	17.5	13	33.3	8	20.5	3.23
7.	My students are allowed to bring their computers to the college	9	22.5	8	20.0	12	30.0	6	15.0	5	12.5	2.75
8.	There are other ICT facilities used for teaching and learning in my college	6	15.4	7	17.9	16	41.0	9	23.1	1	2.6	2.79
9.	Non-government organizations contribute to the availability of computers in my college	14	35.0	7	17.5	11	27.5	4	10.0	4	10.0	2.43
10.	Government provides computers in my college	13	32.5	5	12.5	8	20.0	8	20.0	6	15.0	2.73
Average Mean											2.76	

Source: Field Data (2022)

Key:VLE= Very Low Extent,LE = Low Extent, M =Moderate, HE= High Extent, VHE = Very High Extent

Table 1 presents the responses of tutors on the extent of availability and utilization of computers for improving teaching and learning in teacher colleges. The information from the table shows that out of 40 tutors the moderate (55%) of tutors indicated moderate on the statement that there are enough computers in the college for teaching and learning while extremely minority (15%) of tutors indicated a low extent and very low extent and other minority (30%) of tutors have also indicated that computers are available to a high and very high extent. This implies that computers are available to a moderate extent in most colleges. However, in some colleges, the computers found to be available to the lowest extent. These findings are in line with what was emphasized by the college principal from college “B” during interview, who stated that;

In this college, there are computers which are always used by students and tutors for teaching and learning but in fact, we need to make them more available for example here there are only 36 computers while there are more than 100 students and 20 tutors (*personal interview with college principal, 4th May 2022*).

The information obtained from the college principal shows that in the college computers are somewhat available for facilitating of the teaching and learning process. These findings imply that the inadequacy of computers in colleges raise more challenges in the entire process of teaching and learning which hinders the attainment of the objective of introducing computers use in the pedagogical process.

The findings concur with the study by Magen and Maskit (2016)in Israel who revealed that problem of classrooms that containing interactive whiteboards and computers are very few, most of teacher colleges have the problems of computer software’s that used for preparing materials for presentation. Therefore, the introduction and application of computers in colleges have not materialized as articulated in the ICT policy (2016) which emphasizes the usage of computers for teaching in the sense that the inadequacy of computer is still creating more challenges than reducing the burden experienced in the entire teaching and learning process before the introduction of computers in colleges. The same findings were revealed through observation

were the researcher observed the presence of 177 computers while the demand were 514 computers hence that there is a shortage of 337 computers.

On the other hand availability of a computer laboratory is also important for students to learn effectively. The data from table 1 indicated that slightly minority (25%) of tutors indicated a low extent rate on the statement that there is the availability of a computer laboratory in the college while slightly moderate (45%) of tutors indicated a moderate rate and minority (30%) of tutors indicated a high extent rate.

This implies that computer laboratories were established at a in the colleges but they are few and not satisfied. However, in some colleges, computer laboratory were found to be available to the lowest extent. During an interview with one of the college principals from college "A" confirmed that: *There is one computer laboratory in our college, few computers and other equipment, poor services such as electrification system in classrooms. Some computers are not working properly in the laboratory (personal interview with College principal, 28th April 2022).*

The information obtained from the college principal indicated that computer laboratories are somehow available to facilitate teaching and learning in the college but have some challenges. These findings implied that the challenges of computer laboratories hinder the target goal of delivering training using computer technology. This finding concurred with the study conducted by Bello (2018) in Nigeria who revealed that level of utilization of ICT is low and only few computer packages and internet services were involved in the ICT utilization. The study also informed that availability of ICT facilities influences their utilization for teaching LIS in the University of Oyo.

The findings obtained in Nigeria implied that it is not only in Tanzania where there is the problem of computer laboratories but even in Nigeria the problem of inadequate establishment of computer laboratories for teaching and learning is still a concern. Therefore, using computer technology as an instructional paradigm to deliver training has not been emphasized enough in the sense that challenges in computer laboratory are still abound and hinder the use of computers for teaching and learning. In addition to that during observation and checklist use revealed that there are 5 computer laboratories while the users were 926 and the demand was about 9 computer laboratories, in that sense there is a shortage of 4 computer laboratories.

In the context of the college principal participation in making sure that computers are available and used for improving teaching and learning in the college slightly moderate (45%) of tutors indicated low and very low extent rate on the statement that the principal provides computers that are used for instructing teaching and learning while minority (20%) of tutors indicated moderate extent and other minority (35%) of tutors indicated high and very high extent rate of the same statement. This implies that college principals provide computers at a low extent in most colleges. Nevertheless, in some colleges, principals provide computers to the lowest extent. These findings rely on what was emphasized during an interview with one principal from college “B” who confirmed that:

I always find stakeholders contributing towards availing more computers and computer laboratories and other ICT facilities and also to make sure that the computers which are available in the college are working by facilitating maintenance although this strategy is not working effectively (*personal interview with principal, 4th may 2022*).

The information obtained from the college principal shows that somehow principals made availability computers to facilitate the teaching and learning process. These findings imply that there are challenges for making available more computers in the colleges for teaching and learning purposes.

These findings concurred with the study conducted by Chirwa (2018) in Tanzania who revealed that school administrators try to look for more availability of computers and other ICT facilities. Generally, the application of computers in the colleges has used but accompanied with different challenges informed by Harry (2007) who emphasizes that the Tanzanian government issued an order to emphasize more use of computers in the position that solving the problem of shortage of computers that employed as the methodology of teaching and learning.

Data from Table 1 shows that minority (33.3%) of tutors indicated low extent rate on the statement that there are other ICT facilities that are used for teaching and learning while other minority (41%) of tutors indicated moderate rate and again other minority (25.7%) of tutors indicated high extent rate.

This implies that other ICT facilities are available to a moderate extent in most colleges. However, in some colleges, the other ICT facilities found to be available in lowest extent. More information from the table shows that the mean scores of the same item was 2.79. This means

that the mean score is below the neutral point which is 3.00. This finding correlates with that obtained from one college principal during an interview in college “C” who remarked that:

Apart from the computers being used for teaching by tutors also, students used their smart phones but are not all students have this kind of phone but they are always encouraged to buy computers and other ICT facilities that could be useful for learning purposes (*personal interview with college principal, 5th May 2022*).

The information obtained from the college principal indicated that in teacher colleges other ICT facilities are somehow available to be used for teaching and learning. These findings imply that there is inadequate ICT facilities in the college that brings some challenges during teaching and learning process hence limit students’ creativity and innovativeness.

These findings concur with the study by Jakwa (2021) in Nigeria who revealed that most of the resources are not available and if available are not in large quantity to be utilized for large group of students.

Therefore, uses of other ICT facilities in colleges’ has not been practiced enough as articulated by activity theory which emphasizes interaction between students and learning facilities in the situation that shortage of these ICT facilities is still making the use of technology for teaching more of a challenge than encouraging its facilitation in teacher colleges. The same burden were observed and revealed by using checklist were other ICT facilities such as projectors were in adequate due to fact that there were 17 projectors while the demand was 31 projectors hence that there was a shortage of 14 projectors in teacher colleges.

Furthermore data in Table 1 shows that non-governmental organizations contribute for the availability of computers in the colleges. The moderate (52.5%) of tutors responded low extent rate on the statement while minority (27.5%) of tutors responded moderate rate other minority (20%) of tutors responded high extent rate.

This implies that non-government organizations contribute to the availability of computers at low extent rate in most colleges. In the colleges it was found that non-government organizations contribute to the availability of computers at the lowest extent rate. These findings are in line with what was emphasized during interview with one principal from college “C” who stated that:

From the time I was appointed to work as principal of this college all facilities are always bought and provided by the owner of the college. Other people provide support in terms of availability of teaching and learning materials but to a very low extent (*Personal interview with college principal, 5th May 2022*).

The information from the college principal indicated that most of the computers which are available in the college were bought and provided by the owners of the college. These findings generally, revealed that both government and non-government organizations help to facilitate skilled manpower, stabilized electricity supply, hardware resources, and software resources to enhance the use of ICT in government schools.

The extent to which the government provides computers to colleges, slightly below slightly moderate (45%) of tutors responded low and very low extent rate on the statement, furthermore minority (20%) of tutors indicated moderate extent rate, other minority (35%) of tutors indicated high and very high extent rate. This implies that the government provides computers to the colleges at a moderate extent.

Addition, in some colleges, the government was found to provide computers at the low extent. These findings imply that in the colleges, the government provides computers for facilitation of the teaching and learning process. These findings correlate with those by Bello (2018) in Nigeria who revealed that reveals that the respondents' level of utilization of computers is low and only few computers are available. The findings suggest that there is need for other educational stakeholders to contribute towards the availability of computers in colleges that could be used for improving the teaching and learning process.

Furthermore, student teachers from the colleges were asked about the level of availability of Computers used for improving teaching and learning in teacher colleges. Table 2 presents a summary of students' responses on the level of availability of Computers used for improving teaching and learn

Table2

Student-Teachers' Response on Level of availability of Computers usage for improving teaching and learning (n=80)

S/N	Statement	VLE		LE		M		HE		VHE		Mean
		F	%	F	%	f	%	f	%	f	%	
1.	My College has a computer that used for teaching and learning	5	6.5	12	15.6	34	44.2	15	19.5	11	14.3	3.19
2.	I am allowed to come with my computers (laptops) to the college	23	29.1	10	12.7	21	26.6	12	15.2	13	16.5	2.77
3.	My College has a Computer laboratory	10	12.8	12	15.4	26	33.3	15	19.2	15	19.2	3.17
4.	There is a provision of computers for students that implemented for teaching and learning in my college	14	17.7	19	24.1	30	38.0	10	12.7	6	7.6	2.68
5.	Government contribute to the availability of computers in my college	19	24.4	14	17.9	23	29.5	10	12.8	12	15.4	2.77
6.	Other educational stakeholders contribute to the availability of computers in my college	13	16.7	24	30.8	27	34.6	10	12.8	4	5.1	2.59
7.	Electrical power is available in my college	11	13.9	7	8.9	17	21.5	22	27.8	22	27.8	3.47
8.	Internet is available in my college	30	39.0	8	10.4	22	28.6	11	14.3	6	7.8	2.42
9.	Non-government organizations provide ICT facilities in my college	35	45.5	11	14.3	22	28.6	7	9.1	2	2.6	2.09
10.	Fund rising helps my college to have enough computers	24	30.4	20	25.3	23	29.1	9	11.4	3	3.8	2.33
Average Mean											2.75	

Source: Field Data (2022)

Key: VLE= Very Low Extent, LE= Low Extent, M =Moderate, HE= High Extent, VHE = Very High Extent

Table 2 presents responses of students on the availability of computer that are used for improving teaching and learning in teacher colleges. The information from the table shows that

out of 80 students slightly moderate (44.2%) of students indicated moderate rate on the statement that the college has enough computers that are used for teaching and learning while minority (22.5%) of students' indicated low and very low extent, and other minority (33.8%) of students indicated high and very high extent rate. This implies that computers are available at a moderate extent in most colleges. However, in some colleges, computers were found to be available at the lowest extent rate. These findings imply that in some colleges computers are not available. This raises more challenges in the implementation of education policy that proposed computers to be used as a pedagogical process.

The colleges are needed to allow students to come with their computers to colleges. This plays an important role of increasing the availability of computers in the colleges. The information from Table 2 shows that minority (41.8%) of students indicated low extent and very low extent to the statement that students are allowed to provide their computers, while minority (26.6%) of students indicated moderate other minority (31.7%) of students indicated high and very high extent rate. This implies that students are allowed to provide their computers to a moderate extent in most colleges. However, in some colleges, students being allowed to bring their computers were found to be at the lowest extent. These findings concurred with the one by Davis and Kohun (2018) in USA who indicated that students use their personal laptops for 30% to 50% of within-class work assignments. Therefore, the use of computers in colleges has not been well addressed in the sense that poor involvement of students in using computers is still a challenge in minimizing the experienced problems of teaching and learning without using computers in colleges.

The issues of availability of computer laboratories in colleges as shown in table 2 informed that extremely minority (33.3%) of the students identified moderate extent rate while minority (28.2%) of students indicated low and very low extent rate and other minority (38.2%) of students indicated high and very high extent rate. This shows that in the colleges, computer laboratories are available to a moderate extent. On the other hand, computer laboratories are found to be available at the lowest extent rate. These findings concurred with the study conducted by Justice et al., (2022) in Ghana who reported that the availability; accessibility and utilization of the services (computer laboratory) were generally limited. Therefore, the situation makes it difficult for computers being utilized in order to reduce previous experienced

challenges that cut across teaching and learning processes in colleges. This finding generally suggests that in every college there is inadequate provision of computers for the students' learning.

About the extent rate does government contribution to the availability of computers in the colleges, minority (42.3%) of students indicated low extent and very low extent on the statement while minority (29.5%) of students indicated moderate rate and other minority (28.2%) of students indicated high and very high extent rate. This implies that government contributes towards the availability of computers in most colleges to a low and very low extent. In addition, in some colleges, government contributes towards the availability of computers to a moderate extent. These findings implied that government contributed computers in some colleges while in other colleges they did not. This raises some more challenges in the colleges for having inadequate computers thereby hindering the entire process on the achievement of the targeted objectives of employing computers in the teaching and learning process. Therefore, application of computers in colleges for teaching and learning is not encouraging although the ICT policy (2003) emphasizes on collaboration of the Government with other stakeholders to promote the use of ICT in education. The inadequacy of computers in colleges is still problematic in most colleges.

Other educational stakeholders contributing to the availability of computers in colleges, table 2 indicated that slightly moderate (47.8%) of students point out that other educational stakeholders contribute to the availability of computers at low and very low extent rate while some others minority (34.6%) of students indicated moderate and extremely moderate and extremely minority (17.9%) of students indicated high and very high extent rate. This implies that educational stakeholders contribute towards availability of computers in most of the colleges at the lowest extent rate. Also, in some colleges stakeholders contribute towards the availability of computers to a moderate extent. These findings are similar with the study conducted by Onyango (2021) in Kenya who revealed that schools faced inadequate availability of ICT facilities and internet connection. They also faced limited electricity supply and limited funds for maintain the facilities therefore education stakeholders and the government should allocate funds for buying ICT facilities, devices and maintenances.

On the other hand electrical power is very important as computers cannot operate without electrical power. Table 2 indicates that slightly minority (22.8%) of students indicated that there is availability of electrical power in the colleges at low and very low extent, the other slightly minority (21.5%) of students indicated moderate extent and moderate (55.6%) of students indicated high and very high extent rate. This implies that electricity is available at the lowest extent in some colleges. Similar findings were reported by Dauda et al (2021) in Nigeria who revealed that the level of electrical power in the college was low; the impact of performance of electrical power indicated a negative impact. Therefore, application of computer in the colleges has not been enhanced enough for improving teaching and learning in the sense that absence of electricity is still hindering the use of computers in the teaching and learning process.

Fund raising is considered to be a good approach to availability of enough computers that could be used to improve teaching and learning in the colleges. Information from table 2 indicates that moderate (55.7%) of students indicated that fund rising contributes to adequacy of computers in colleges to low and very low extent rate while extremely minority (15.2%) of students indicated high and very high extent and minority (29.1%) of students indicated moderate extent rate. This implied that fund rising contributes to availability of computers to the lowest extent in most colleges. Furthermore, in some colleges fund-raising was found to help having computers was responded to at a moderate extent rate. These findings imply that due to the low contribution of fund rising on availability of enough computers in the colleges, this worked against the achievement of Tanzania ICT policy campaign (2016) which insists on the promotion of technology use in education.

9. Conclusion

Based on the findings, the study concluded that:

In most of teacher colleges in Kilimanjaro region there is inadequate availability of computers that are used for improving teaching and learning. On the other hand computer laboratories are not adequately established also, the other ICT facilities are still a challenge in the colleges. In teacher colleges utilization of computers has a positive impact for improving teaching and learning. The Tanzania government is providing computers into the colleges but some tutors do not use them as the technology pedagogy for improving teaching and learning in teacher colleges in Kilimanjaro Region.

10. Recommendation

The Permanent secretary of the Ministry of Education Science and Technology, and college administrators' should provide more computers and other ICT facilities to teacher colleges that would be utilized for improving teaching and learning. Also tutors and students should be more equipped with skills for using computers for improving teaching and learning process.

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