

INFORMATION AND COMMUNICATION TECHNOLOGY ACCEPTANCE FOR TEACHING AND LEARNING AMONG SECONDARY SCHOOL TEACHERS IN NIGERIA

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ABSTRACT

This investigates on the importance of information and communication technology (ICT) as a tool for teaching, learning and research that is dramatically changing the landscape of educational development globally. The ICT in the educational sector divulge a plethora of opportunities for different categories of educators to integrate ICTs their service delivery of teaching, learning and research. However, plenty of literatures suggest that do existed significant resistance to the technology some among teachers in Nigeria especially at secondary school. This becomes a deterring factor for successful integration of ICTs in such schools in Nigeria in general. The paper uses modified Technology Acceptance Model (TAM) to ascertain the level of ICT acceptance in teaching and learning across selected teachers in secondary schools in Nigeria. Questionnaire was used for collecting relevant data for the study. Purposive sampling was used and data was analyzed using SPSS and AMOS 18.0. The finding of the study indicates a significant relationship between attitude, intention, self-efficacy and acceptance. The study concludes that besides obvious problems at stake anxiety and technophobia have been some other curtailing factors resisting viable use of ICT for teaching and learning process, thus, transcending bridging the digital divide in the country at high risk of failure.

Keywords: Technology, Acceptance, self-efficacy, TAM, ICT, Nigeria

INTRODUCTION

Education is said to have started as early as the creation of man. It is simply a system through which one generation transfers or imparts the ideals and cultural practices of its society to the next generation in an unending process. This process of transmitting education requires certain materials medium. To this end, for a better transfer of knowledge from one person to another, there has to be a desirable medium of information and communication technology tools.

The world is fast becoming a global village as a result of the development in information and communication technology. The key instrument in this globalization is the computer. Computer mediated instruction is increasingly becoming the fact of everyday life particularly in the developed and some very few developing countries such as Nigeria. The information technology has changed how people live, work, play, study and so on (Kalu, & Ekwueme, 2003).

In this information age, education sector becomes one of the most important areas that has not been ignore by the information technology to transform the spectrum of the educational landscape specially at the secondary schools (Christensen, 2004). In Nigeria today, traditional pattern of classroom teaching have remained largely unchanged. The typical pedagogical pattern

reflects an authoritarian, didactic approach to classroom managements. At the secondary levels teaching and learning process is largely centered on textbooks due to inadequacy of modern instructional materials (Adamu, 1992).

This study evaluates the extent to which information and communication technology (ICT) has been accepted by the teachers at this level as well as its effects on the learning process. World Bank (2002) reports, “information technology holds out the opportunity to revolutionize pedagogical methods and expand access to quality education system.” The absence of this technology among teachers could not equip the students to learn effectively in the modern age of technology as stipulated in the national policy on education (FME ETF Project, 2005). Information Technology has been identified worldwide as a way out for improving our knowledge. For example full access to internet is just equivalent to having access to a good library.

Therefore, to brace up to the new challenges and system of education through the deployment and use of Information Technology in Secondary Schools in Nigeria requires a collectives approach among the stakeholders (Alabi, 2004). Already, Nigeria is almost two decades behind in embracing the use of computers and other modern tools in both secondary schools’ classrooms (Kalu, & Ekwueme, 2003). “While information technology has invaded and dominated High Schools teachers in the developed societies, its incursion into Secondary Schools in Nigeria has been painfully slow. Nigeria ranks lowest among prominent African countries in the use of information Technology among teachers in secondary schools” (World Bank, 2002).

Scope

The scope of this study focused on the availability and especially usage of modern instructional materials and the way these materials are accepted in teaching and learning process in some selected secondary schools in Nigeria. In line with the consideration of imperativeness of feasibility in research procedure the study sampled Bauchi state as case study.

OBJECTIVES

This research identified the following objectives:

1. To find out the extent of secondary school teachers disposition toward ICT in teaching in relation to intention, self-efficacy and acceptance
2. To find out the extent to which information technology facilities enhance teaching and learning in secondary school in Nigeria.
3. Evaluate the availability of (ICT) equipments in the Nigeria secondary schools.

Thus, the proposed model is as follows:

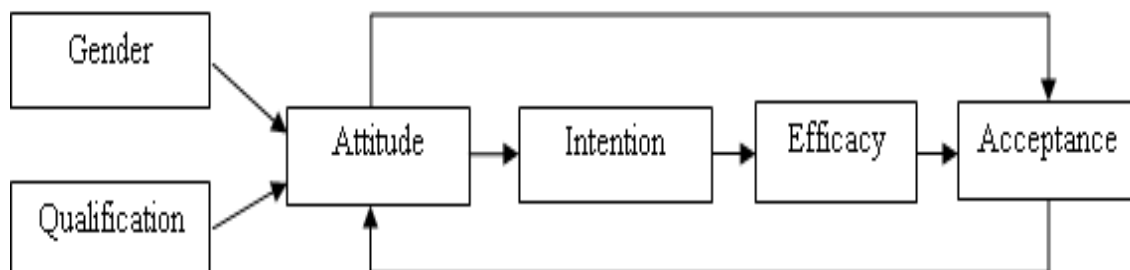


Figure 1. The propose model

Research Questions

The study aimed formulated the following questions:

Q1. To what extent is the attitude of secondary school teachers toward ICT in Nigeria and its relationship with intention, self-efficacy and acceptance?

Q2.To what extent do ICT facilities enhance teaching and learning in secondary school in Nigeria

Q3. To what extent is the availability of ICT facilities in secondary school in Nigeria?

Q4. To what extent are the differences in attitude towards using ICT in terms of gender and qualification?

Significance

One significance of this paper is, provides to the policy makers and educational planners the necessary information required on the importance of using ICT in teaching in secondary schools. This will enable the government to make decisions regarding the provision of the ICT facilities as teaching aids in secondary schools. In spite of its limitations the report in this study cannot be generalize on all the Nigerian secondary schools, however, it would serve as a roadmap to other all other states and the federal governments to adopt for the viable development of ICT tools in teaching in secondary school in the country.

LITERATURE AND FRAMEWORK

Information Technology

The association for educational communication and technology in the United States of America (A.E.C.T.,) define educational technologies as complex, integrated processes involving people, procedures, ideas, devices and organization for analyzing problems and devising, implementation, evaluating and managing solution to those problems involving in all aspect of learning.“

By this definition technology in educational sector is as old as the history of education itself. Man started developing more effective and efficient ways as improving instruction since the Stone Age. Use of visual materials such as stones and pebbles were evident up to the time of the Sophist who lived in the 15th century BC. They were considered as the first educational technologists by using systematic approach and techniques in teaching.

Information and communication technology is a means of receiving, processing, storing, retrieving and dissemination of information through the use of computer and other related telecommunication facilities. It is also hold (Christensen, 2004) that Information and communication technology is the use of hardware, software, services and supporting infrastructures to manage and deliver information using all sorts of data. Strong relationship between education and technology was realized since 1450 up to the time when Johnnes Gutenberg (Johannes Gutenberg. Microsoft® Student, 2008) invented a hand set printing press. Now education and ICT relates in the advance areas of holography and nanotech. Modern technologies now make it possible unified the globe at all the time and in all interest including teaching learning processes.

Relevance of ICT in Education

- I. It facilitates independent study and teamwork
- II. It supports and assist students for conventional classroom work
- III. It plays a key role in administration, accounting and records keeping
- IV. It enhance teaching and learning
- V. It improves inspection and supervision

Attitude towards ICT

Many efforts have been made in different countries to achieving technological literacy in secondary schools. One of the most formidable challenges of this in Nigeria is lack of commitment by government and individuals concern (Akande, 2005).

It is postulated, (Christensen, 2004) that perception of the potential usefulness of the computer could influence attitude towards information technology. The amount of confidence a teachers possess in using information technology may greatly influence their effective implementation in the classroom. Positive teacher attitude towards computers are widely recognized as a necessary condition for effective use of information technology in the class room (Suleiman, 2012).

Secondary schools are getting better at using ICT worldwide. Some schools have testified that ICT improves pupils' motivation. In Africa, relevant efforts are being made in the field of ICT. For instance the association for the development of education in Africa (ADEA) and reports that ICT is changing the face of education. Thus, the impact of the information and communication technology on teaching and on the way children learn has significantly improved (www.adeanet.org/ publication).

Integration of ICT in Secondary Schools

The technology revolution is challenging and redirecting all forms of education, including secondary school education. The incorporation of technology into the teaching and learning process has become an important component throughout all areas of education (Suleiman, 2012). Staff development is most effective when it is individualized. This means, giving opportunity to learn flexibly the contents, the method and at any time. It has been suggested (Christensen, 2004) that computer experience should be provided for pre-service teachers prior to their involvement in teaching. He further argued that teachers trained on ICT are more likely to use the tools personally and in their classroom thereby promoting positive attitude. These training should include strategic plans rather than introducing teacher productivity tools alone (UNESCO, 2002). Nigeria is ambitioning to become among the top twenty develop nation by the year 2020. Nonetheless, any develop nation today is an information society thus, such a nation demands a workforce that can use technology as a tool to increase productivity and creativity (Igwe, 2005).

It is shown (Kalu, & Ekwueme, 2003) that 72.7% of secondary schools in cross river state have a computer and only 50.0% of the teachers computer literate and none of these that have computer that are linked to the internet. They further argued that "the awareness of and knowledge ability of teachers in educational application of information and communication technology are far below expectation, where as their attitude towards the application of ICT in teaching and learning process is not significant. Similarly, only some few government secondary schools in Bauchi State have computers in their schools and none of these schools have been

connected to the internet. These have under scored the relevance of information and information and communication technology.

The (UNESCO, 1999) Report identified a number of factors that have been hampering the improvement of internet in Africa. These include:-

- a. The small number of potential user having both the skill and equipment to benefit from access to electronic information network.
- b. Lack of reliable and accessible physical telecommunication infrastructures
- c. The scarcity and high cost of equipment software and information compared to situation in other developing countries. These factors have not only the educational but the entire society in Africa. As a result of this it makes the Nigeria government in the last five years in liberalizing the communication sector and easing the floor of information have assisted greatly in accessing the internet.

Technology Acceptance Model

It has been stated (Suleiman, 2012) that the original version of the Technology Acceptance Model was created by Davis (1989) to focus on the domain of user acceptance of technology by replacing the attitudinal components of the theory. In their report (Venkatesh *et al.*, 2007) stated that TAM is considered to be well-established and robust. It has been emphasized (Davis, 1989) that within organizational settings, people form intentions toward behaviors which they believe may increase their job performance. It was opined (Venkatesh *et al.*, 2007) that TAM predict acceptance, but does not always help understand and explain acceptance. In their study (Tung, & Chang, 2007) created an extended TAM, by including computer self-efficacy to explain adolescent technology acceptance. Computer anxiety had a negative impact on computer self-efficacy and ultimate intent to use it (Suleiman, 2012).

METHOD

The study adopted a mixed mode survey research where both qualitative and quantitative approaches were carried out. Some part of the population was used as sample for proper analysis. The target population of this research composed of all the total number of teachers in secondary schools in Bauchi state Nigeria counting to the total number of 5500 all in all. Considering the size of the population and the time frame some selected secondary schools were sampled as the target population numbered 45 from which the accessible population were sampled numbered 370 according to (Israel, 2009) sample calculator. This sample was purposely and random sampling selected from whose responses was analyzed. To maintain ethical administration of the procedure, the total numbers of 400 questionnaires were distributed during the teaching practice excise supervision of the college of education Azare NCE students at various secondary schools across the state. The researchers solicited the college of education academic staff to assist in administering and collection of the instruments. The researchers conducted verbal interview with the few purposively selected teacher who voluntarily participated in the interview.

INSTRUMENTATION

For simplicity and ease of eliciting feelings, disposition, experience opinion of the subjects sampled in the study, the structured questionnaire designed was on the assessment of the secondary school teachers. The instrument called (SESTA-ICT) secondary school teachers' attitude of ICT materials were administered on the teachers in the sampled schools. In addition to

the questionnaire, some of the teachers in each selected school were equally considered and subjected for a short focus group interview reflecting the same items on the questionnaire for further confirmation of their disposition.

The questionnaire was validated through piloting and vet by measurement and evaluation expert. It was found reliable with the Cronbach alpha of .91.

The method employed in the presentation and analysis of the data and information is descriptive statistics, regression and t-test to provide extent, comparison and of course the difference among the subject respondents.

RESULT

This section presents the result according to the three research questions as follows:

The demography indicates that 69.5% (257) were male while 30.5% (113) were female. In terms of their qualification those who indicated having Nigeria certificate in education (NCE) were 169 representing 45.7%. Those with first degree were 121 representing 32.7, while the remaining 21.6% (80) indicated that they had their master degree.

Q1. To what extent is the attitude of secondary school teachers toward ICT in Nigeria and its relationship with intention, self-efficacy and acceptance?

Table 1. Cross Correlation between Attitude and Acceptance

		<i>Correlations</i>			
		<i>ATT</i>	<i>ACPT</i>	<i>EFCY</i>	<i>INT</i>
<i>ATT</i>	Pearson Correlation	1	.283**	-.009	.003
	Sig. (2-tailed)		.000	.864	.956
	N		400	400	400
<i>ACPT</i>	Pearson Correlation		1	.209**	.141**
	Sig. (2-tailed)			.000	.007
	N			400	400
<i>EFCY</i>	Pearson Correlation			1	.477**
	Sig. (2-tailed)				.000
	N				400
<i>INT</i>	Pearson Correlation				1
	Sig. (2-tailed)				
	N				

** . Correlation is significant at the 0.01 level (2-tailed)

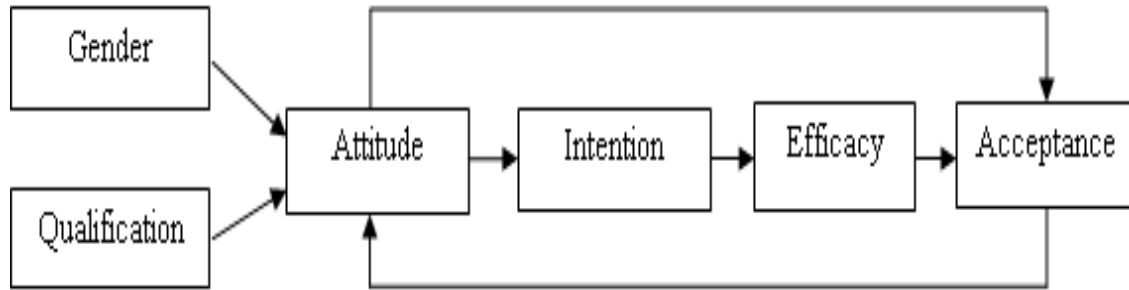


Figure 2. The actualized model

The table 1 above and figure 2 identifies the significance of the correlation between the Attitude, intention (.003), self-efficacy (-.009) and acceptance (.283^{**}). It also indicate a reverse correlation between acceptance and self-efficacy (.209^{**}), intention (.141^{**}) and attitude (.477^{**}). From this it can be understood that the higher the level of attitude more the level of acceptance to use the ICT tools. Whereas the lower the intention the lower the attitude towards the use of ICT tools among the secondary school teachers in Nigeria. In addition to that there is an invariable negativity between the self-efficacy and attitude towards the ICT tools.

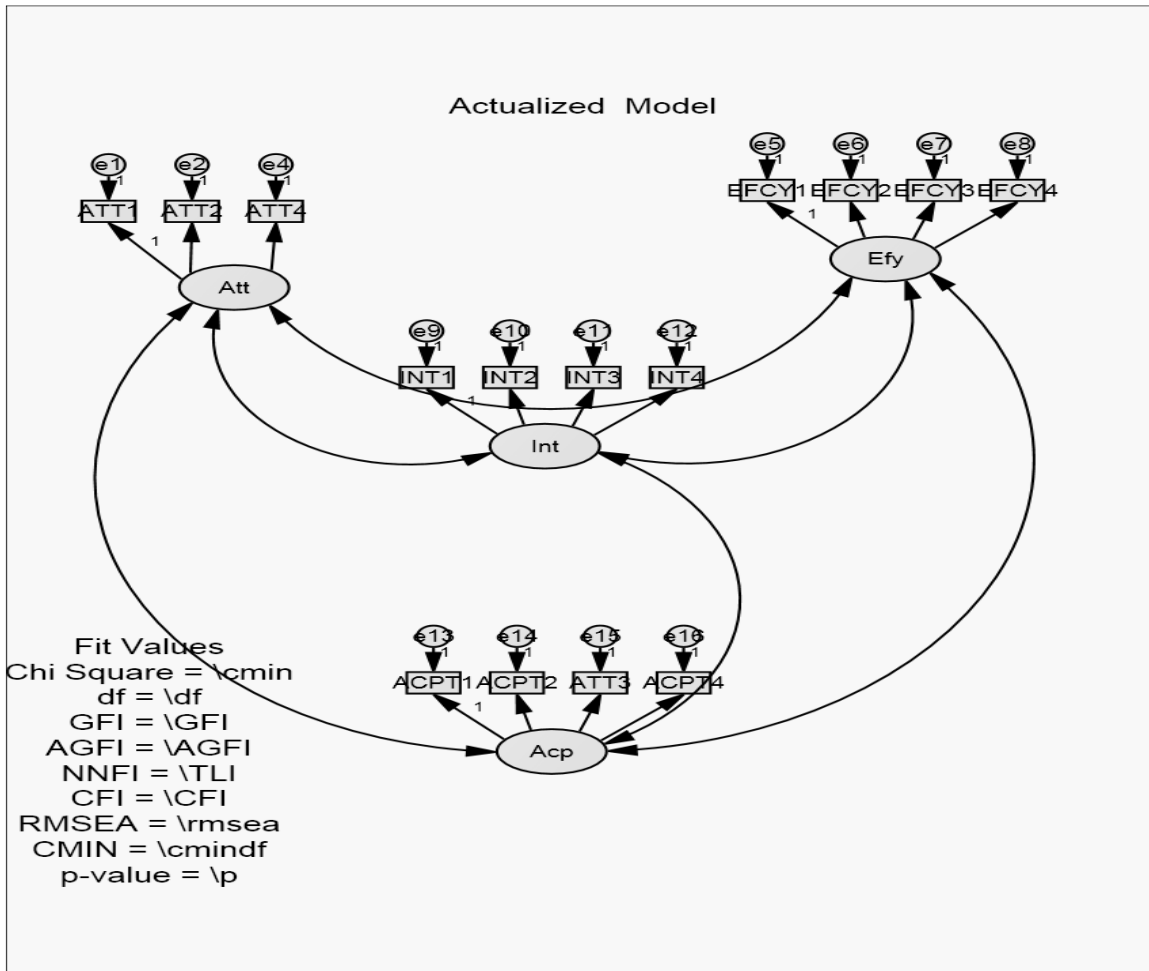


Figure 3. The SEM Actualized model

Q2.To what extent do ICT facilities enhance teaching and learning in secondary school in Nigeria

In the interview significant numbers agreed that ICT has some relevance to the curriculum requirement in teaching computer, while some of the respondents stated that it had no any relevance to the curriculum requirement in teaching of computer. More others agree to have been encouraging others in the use of tools for teaching. It was also found that some teachers have their personal computers but majority of the teachers don't have computer or any ICT tool beside mobile phones. They also reported lack of computer literacy. About using the ICT tools help to accomplish tasks more quickly, majority accepted that any academic tasks one to perform would be very easy if employ ICT tools very insignificant did not accept this notion. On the question if an ICT tool improves productivity, it shows that majority responded positively that ICT tools can improve productivity. On another issue, overwhelming majority does agree that they like using ICT tools in teaching in the various schools. Many of the respondents interviewed stated that they enjoy using ICT tools although now adequately available. On the assessment of the performance of students taught with ICT facilities. Almost half of respondents confirmed that these facilities has made the performances of students to be good however another significant numbers of respondents disagree that ICT tools enhance performance of students as the facilities were not adequately available for the students.

Q3. To what extent is the availability of ICT facilities in the Nigerian secondary schools?

Table 2. Distribution on the Secondary Schools ICT facilities

S/No	Variables	Frequency		Total	Yes%	No%	Total %
		Yes	No				
1	Computer	240	160	400	60	40	100
2	Internet Cafe	190	210	400	47.5	52.5	100
3	Projector	120	280	400	30	70	100
4	Public Address System	300	100	400	75	25	100
5	Audio/Audio Visual Material	320	80	400	80	20	100
6	Smart board	50	350	400	12.5	87.5	100
7	White board	330	70	400	82.5	17.5	100
8	Projector screen	170	230	400	42.5	57.5	100
<i>Grand Total</i>				400	57.8%	42.2%	100

The table 2 above shows frequency level on ICT tools availability in secondary schools in Nigeria. It indicates that 60% of the secondary schools have computers, 75% possess public address system, 80% have audio-visual facilities and 82% have white boards. The result also indicates that only 12.5% of the schools have interactive smart boards and 30% have projectors. Most schools with the availability of the electronic facilities indicate poor functioning to the fullest which might have been due to poor electricity and expertise in managing such facilities.

Q4. To what extent are the differences in attitude towards using ICT in terms of gender and qualification?

Table 3. T-test and Levene's Test on attitude in terms of gender

	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
ATT	2.927	.088	.984	398	.326	.25015	.25427	-.24986	.75017
			1.051	251.289	.294	.25015	.23804	-.21866	.71897

The table 3 indicates significant difference does exist between genders on the attitude towards using the ICT facilities in teaching among the teachers of secondary schools in Bauchi state Nigeria

Table 4. ANOVA test on attitude in terms of qualification

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.876	2	1.438	.282	.754
Within Groups	1869.553	397	5.094		
Total	1872.429	399			

The table 4 indicates significant difference does exist among the Bauchi state teachers of secondary schools in Nigeria on the attitude towards using the ICT facilities in teaching among. The table 5 below indicates that the scheffe post hoc test identified the mean difference between the degree holders (.101) and the NCE holders (.227). Meaning those with master have more positive attitude than those with the NCE (-.227) and first degree (-.126).

Table 5. Scheffe post hoc test on Attitude

(I) QUAL	(J) QUAL	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
NCE	DEGREE	.10103	.26878	.932	-.5596	.7616
	MASTER	.22761	.30630	.759	-.5252	.9804
DEGREE	NCE	-.10103	.26878	.932	-.7616	.5596
	MASTER	.12658	.32523	.927	-.6728	.9259
MASTER	NCE	-.22761	.30630	.759	-.9804	.5252
	DEGREE	-.12658	.32523	.927	-.9259	.6728

DISCUSSION

The finding of this study shows a significant level of positive attitude of secondary schools teachers towards information and communication technology materials in their service delivery the teaching learning in Nigeria. This was favorably established from the analysed data obtained from the respondents.

The study reveals that the introductions of ICT material have improved both the teachers and students performance in their field of study. The available ICT materials are employed in the teaching/learning at various schools. Such tools include computers, public address system, internet café, audio/ audio visual and projectors, and so on. This shows an improvement on the issues of ICT in the country. However, it reveals some persisting setbacks regarding the adequacy of the material, proficiency in using them and vulnerability to poor maintenance culture; couple with the poor supply of power and funds.

CONCLUSION

Global access to information technology provides an open door to improve the quality of life and providing a global forum for the opening of discussion of ideas worldwide. The finding of the study indicates a significant relationship between attitude, intention, self-efficacy and acceptance.

It is imperative for Nigerian teachers in secondary schools to have positive attitude towards information technology. Nigerian library schools should be linked up with others libraries in others countries that are well a head in harnessing the new technology in education and training learning from the experience of other who are advanced in technological application would provide resources for skills and knowledge acquisition necessary for the advancement of education in Nigeria in the 21st century.

In improving teachers' attitude towards information technology through the rapid changes in the global information technology era which has a significant relationship on the improvement and development of education in the area of programme planning, staff management resources and teaching activities.

RECOMMENDATION

The success of any country in this era of globalization could depend on the effort to have a viable educational policy, which would lead to the development of the entire country.

There is the need to improve the academic training of teachers in Nigeria towards utilizing the potentials in information Technology.

It imperative for planners and providers of education (federal and state governments, nongovernmental organization and other stake holders) to reflect and redesign education delivery policy by making information technology one of the central focus on their curriculum. This will enhance the attitude of teachers towards information technology.

It is will be of advantage to involve the private sector in fund raising to support the provision of ICT tools in all institutions. This approach has been on the track in Nigeria where several educational institutions have established partnership with private sector.

Moreover, the government should have restrictive measures on the education system at all levels on the challenge of corruptions and poor maintenance culture posed on technology at the schools. Government should to make policy in enforcing that computer literacy become necessary in teacher education institutions. Provision for sufficient access to digital technologies and the internet in secondary schools should be made at high quality and quantity.

In-service training and re-training on information and communication technology through workshops should be on the alp for secondary school teachers.

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