
Challenges of Information Communication Technology (ICT) as a Measure for Comparability of Quality Assurance Indices in Teacher Education

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Abstract

This study investigated the roles of information Communication Technology (ICT) in comparability of quality assurance indices in teacher education across countries. Five research questions guided the study, which was conducted in Cross River state college of education, Akamkpa. A systematic random sampling technique was used to choose a sample of 240 lecturers (160 male and 80 female) that was used to collect data for the study. The questionnaire was faced and contently validated by experts in computer education and measurement and evaluation in the college. The completed instruments were scored and analyzed using percentages and the results used to answer the five researcher questions. The following results were found (1) poor awareness of the use of ICT for teaching and learning (2) inadequate ICT facilities (3) Low utilization of ICT (4) Most lecturers do not have the needed competences (5) There is difference in male and female use of ICT . It was recommended therefore that (1) Government should ensure that ICT facilities are provided in colleges of education. Education Trust Fund should

be involved in the procurement of ICT devices. (2) Government should enforce the implementation of ICT curriculum colleges of educations with a view to incorporating the use of computer and ICT assisted instruction in the teaching and learning process. (3) Lecturers' colleges of education levels should be trained on the use of ICT facilities through regular seminars and computer literacy workshops to keep them abreast of computer and ICT based instruction.

Education is the basic instrument of economic growth and technological advancement of any society. It is in recognition of this that governments commit immense resources to ensure the provision of education for their citizens, and also tailored their policies towards ensuring that it is made accessible to the generality of their citizenry. Today, the world's workplace is becoming increasingly geographically fluid across national, regional and international borders due to economic globalization and the development of advanced communications and information technologies. In this context, knowledge has emerged as an economic commodity which has in turn placed pressure on existing national systems to ensure they are placed competitively in the international marketplace. The driver of education is the teacher, hence teacher education is indispensable. Teacher education may be defined as the education targeted to training teachers. The goals of teacher education in Nigeria are to:

- Produce highly motivated, conscientious and efficient classroom teacher for all levels of our education system
- Encourage further the spirit of enquiry and creativity in teachers
- Help teachers to fit into the social life of the community and society at large and to enhance their commitment to national objectives
- Provide teachers with the intellectual and professional background adequate for their assignment and make them adequate to any changing situation not only in the life of their country but in the wider world
- Enhance teacher commitment to the teaching profession. National Policy on Education, NPE (2004).P 33

In realization of the important role which education plays as an agent of National development and globalization, there has been agitation for more functional and qualitative education all over the world. This agitation and concern for quality education is reflected in the inauguration of Education for All (EFA) in Jomtien (Thailand) in 1995 and Dakar in 2000. This was followed by a meeting called by the 56th General Assembly of the United Nations to discuss the implementation of the Millennium Development Goals (MDGs).

United Nations came up with a target that all member states should achieve. They include:

- Ensuring that by the year 2015 all children particularly girls, children in difficult circumstances and those belonging to the ethnic minorities have access to a complete free compulsory and good quality primary education.
- ensure that the learning needs of all young people and adults are in line with the MDGs
- eradicate extreme poverty and hunger,
- Achieve universal primary education by 2015 (UNESCO, 2001).

Member countries translated their zeal to action by making enabling legislations and setting up agencies that led to rapid growth on the number of educational institutions (primary, post primary and higher institutions). In Nigeria, the need was identified for an agency to oversee and coordinate the education systems. Consequently, Tertiary Education Regulatory Commission was established to coordinate the National Universities Commission (NUC), National Board for Technical Education (NBTE) and Commission for Colleges of Education (NCCE) charged with ensuring orderly development of university, polytechnics and colleges of education in Nigeria, ensuring that it is adequately funded, and maintenance of high standards of quality in Nigerian tertiary education. There is currently a strong move throughout developed countries towards having rigorous, internationally recognized higher education quality assurance processes.

Quality assurance is a mechanism used to evaluate the efficiency and appropriateness of teaching and learning in the schools so as to ensure the delivery of high quality education. It is a holistic method of identifying and resolving problems within the educational system in order to ensure continuous quality improvement. It can also be described as means of disseminating information regarding the quality of education. To Bateman (2006), quality assurance includes defined standards of achievement, documented procedures for all identified processes, established ways of responding to issues and clear accountability for outcomes. And to Birdsall, Levine and Ibrahim (2006), enrolment of children in school, the challenges of access/quality and quality of teaching and facilities must be resolved if schools are to offer quality education.

The importance of consistence and continuous quality assurance in education are many. Some of these benefits to education include:

- the establishment of high academic standards of excellence which will go long way to enhance the school reputation and image,
- improved communication across the school system,
- Improvement of outcome so that the policies and procedures are constantly revisited through analysis and the delivery of teaching and learning,
- identification of systems strengths and weaknesses,

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- determination of the program effectiveness and tracking of its integrity and;
- Increase in capacity to secure funding and refinement service delivery.

In summary, quality assurance connotes the goals to which all school pupils/students, teachers, staff and school leaders must achieve.

According to National Educational Quality Assurance Policy, Nigeria is concerned with 8 components of quality standards itemized as:

- learner achievement and standards;
- learners welfare and participation;
- care guidance and support;
- leadership and management;
- school community relationship;
- learning environment;
- teaching and learning;
- Curriculum and other activities (NPE, 2004).

Thus, quality assurance is the ability of educational institutions to meet the need of the use of manpower in relation to the quality of skills acquired by their products. With this, the quality of an academic programme becomes a universal concern. This is because the product of one institution becomes employee in another institution or other culture's industrial setting. Consequently, quality assurance has become an internationalized concept.

Since this development, the NCCE has heightened its efforts in standardizing the quality of colleges of education in Nigeria.

To establish and maintain high quality standards, the colleges and the NCCE have a shared responsibility in addressing the following key areas:

1. Minimum academic standards form the baseline for entrenching quality education, since it prescribes a profile of curriculum, human resources, structures, infrastructures, equipment and associated facilities required for establishing, governing and managing the college.
2. Accreditation is the process by which programmes are evaluated against set minimum academic standard and college's comprehensive academic research and development) activities are evaluated against prescribed criteria (including self-vision and self-produced strategic plan).
3. Carrying capacity of a university is the maximum number of students that the institution can sustain for qualitative education based on available human and material resources.
4. Visitation to colleges is a statutory requirement that empowers the proprietor to ascertain the well-being of the college.

5. Impact assessment is a specialized form of evaluation aimed at finding out if the core expectations of the establishment of particular colleges are being met.
6. Research is the driving force for human development as globally determined; such research should be evidenced by publications.
7. Structures, infrastructures and utilities are essential driving force for qualitative productivity in any organization, particularly in the college system. (NPE, 2007).

Makoju, Nwangwu, Abolade and Newton (2004) observed that the Whole-School Evaluation (WSE) concept is considered as one of the cornerstones of quality assurance and one way of improving the quality of education. Quality assurance in this concept refers to the monitoring and evaluation of performance of the various levels of the education system in achieving the specific goals at each level and overall objectives of the system. To them, quality assurance consists of three programmes, namely: Whole –School Evaluation (WSE), Systematic Evaluation (SE), and Quality Management System (QMS).

And the purposes of evaluation in the school system are to:

- Assess the quality of school using nationally agreed criteria;
- Increase the level of accountability in the education system;
- Strengthen the support given to schools by government and other agencies;
- Provide feedback to stakeholders through a publication of reports resulting from whole school evaluation; and
- Identify aspects of excellence in schools as well as areas of major under-achievement; thus, improve understanding of what makes an effective institution.

While Institutional evaluation focus on the following key areas to enhance quality:

- Basic functionality of the institution
- Leadership, management and communication
- Governance and relationships
- Quality of teaching and learning/educator development.
- Curriculum provision and resources
- Learner achievement
- Institutional safety, security and discipline
- Infrastructure
- Parents and community (Makoju, Nwangwu, Abolade and Newton (2004))

As laudable this quality assurance mechanism in teacher education may be, there are problems impeding its implementation. These problems include difference in infrastructure, quality of teaching and learning due to staff strength, institutional safety and indiscipline. Put in another way, the challenges in colleges of education sector includes the gory state of our schools-dilapidated buildings, ill-equipped libraries and

laboratories couple with unqualified teachers and discrepancy in the ratio of teachers to students. These noticeable differences may not give room for comparability on standard. Quality assurance indices from these colleges of education have no basis for comparison because of the difference in facilities. One of the ways the gap can be closed is the use of Information and communication technology (ICT).

The government through National Information Technology Development Agency, (NITDA) has designed laudable ways which will make virtually all Nigerians computer literates. This, it believes will resuscitate the dying education sector. Among various policies the agency came up with is the designing of Information and Communication Technology for Development (ICT4D) initiative. This policy aims at using ICT for development in every human endeavor. The agency has trained 610 individual in using the Microsoft applications in educational sector.

NITDA, aware of the fact that teeming population of the nation dwells in rural area, the agency began the establishment of Rural Information and Communication Centers, (RITCs) which will cater for assessment of education and receiving information on line in the rural areas which will facilitate learning aside from confessional classroom business. The number of such centres across the nation is now over 400. The rural areas with their challenges of generating power to make this center work to their full capacity did not escape the notice of the agency. The agency provided those centers with solar system power generating equipment. NITDA has proposed the implementation plan which aim at training a critical mass of Nigerian school teachers in the basic principles and practices of ICT. It also aims at providing critical number of Nigerian school teachers the knowledge of the application of ICT facilities in teaching and learning. This will serve as booster to teachers as there would be availability of materials to research on. And it has also provided vehicle for the ‘train the trainer’ scheme in ICT which will drive development of human resources at school. ‘Catch them young’ policy was designed for the primary and secondary school students which go a long way in repositioning the sector. ICT laboratories are to be built for schools and assisting the nation in intensifying campaign for acquisition of computer for students in these levels. For the tertiary institutions, NITDA aims at promoting the development of indigenous production of software applications for teaching and learning the principles and practices of specific topics of some choice courses or subjects and establishing ICT based libraries and resource centers with internet connectivity that is capable of holding virtually or otherwise both old and current books, journals and periodicals in both print and electronic forms. For any nation to develop, emphasis must be given to education in relation to ICT which is the pivot that holds growth and development. (National Information Technology Development Agency (NITDA), 2010, p 1)

However, Successful integration of ICT in the colleges depends largely on the availability, competence and attitude of lecturers towards the role of modern technologies in teaching and learning. Research works have shown that most secondary schools have either insufficient or no ICT tools to cater for the ever increasing population of students in the schools and where they are available, they are by implication a matter of out-of-bounds to the students (Chattel, 2002; Cheng, 2003; Chiemeke, 2004). Fakeye (2010) also found out in a study carried in Ibadan that most of schools covered in the study do not have computers, hence are not connected to the internet. He added that those schools who have computers do not use them for teaching but solely for administrative purposes.

In another study by Okwudishu (2005), he found out that the unavailability of some ICT components in schools hampers teachers' use of ICTs. Similarly, lack of adequate search- skills and access points in the schools were reported as forces inhibiting the use of internet by secondary school teachers (Adomi and Kpangban, 2010).

A survey carried out by Cirfat and Longshak (2003) revealed that only one school, out of ten has computer sets and has no internet facility. Ozoji (2003) reported in a study that most our secondary schools do not have software for the computer to function. One of the unity schools has five computers against a population of 900 and no internet software was installed. The facilities are grossly inadequate for any meaningful teaching or learning to take place.

On lecturers' competence, the situation is may not be different from the report in secondary schools. Studies in secondary schools have it that teachers are not competent in basic computer operation and in the use of generic software and female teachers seem to be less involved in the use of ICT than their male counterparts (Yusuf, 2005). The summary of these studies is there is low level of ICT penetration in the Nigerian school system. Although these studies were from the secondary schools, the question may then be "is the situation of ICT in the colleges of education different from the secondary schools?" If not, how will the benefits of ICT to comparability of quality assurance indices be achieved? And does sex influence the use of ICT?

Purpose of the Study

This study investigated the roles of ICT in comparability of quality assurance mechanism in teacher education. Specifically,

1. Identify the level of awareness of ICT to teaching/learning by staff of colleges of education
2. How available are ICT facilities in colleges of education

3. Extent of use of ICT in teaching by lecturers in colleges of education
4. Whether the lecturers have the experience and competence needed to use ICT
5. Influence of sex of lecturer on level of ICT use in Colleges of education

Research Questions

As a guide to the study, answers were sought to the following questions.

1. Are the lecturers aware of the roles of ICT for teaching/learning?
2. How available are ICT facilities to the staff of the college of education?
3. Do Lecturers use ICT in Teaching?
4. Do lecturers in colleges have the needed experience and competence in the use of computers for educational purposes?
5. Does sex of lecturer influence ICT use in colleges of education?

Significance of the Study

The results of this study serve as guide for government in planning and implementation of school curriculum in line with global trends.

It also helped in gaining credibility for the teachers and products of the school system. And finally afford the teachers more time for instruction since ICT will take care of the evaluation stage more or less.

Methodology

Research Design

This study adopted a survey type of descriptive research design by administering instruments on a representation of the target population for generalization on the entire population.

Population for the Study

The target population for the study comprised of colleges of education in Cross River State. And the accessible population was Cross River College of education, Akamkpa.

Sample and sampling Technique

A Systematic random sampling technique was adopted in selecting respondents from the college. A total of 240 lecturers were selected from the college to give a sample size of 240 respondents.

Instruments for Data Collection

The instrument for the study was developed by the researcher. The instrument contained three sections. Section A focused on the demographic information of the lecturers. Section B focused on the availability of ICT facilities in the schools while section C contained statements on the usability of these facilities by college lecturers. It has 27 items which follows the two point's scale of Yes/No.

Validity and Reliability of the Instrument

The face validity and content validity of the instrument were verified by experts in Computer Science education and measurement and evaluation in the colleges. The various suggestions made were used to modify the instrument. In order to ascertain the consistency of the instrument, test-retest method was used to ascertain the reliability. A Correlation coefficient of .84 was achieved which was considered high enough to justify the reliability of the questionnaire.

Procedure for Data Collection

The questionnaires were personally administered on the subjects and retrieved back immediately for analysis.

Procedure for Data Analysis

Responses from the questionnaire were pooled together for scoring and analysis to answer the various research questions. Simple percentage was used to answer the research questions

Results

The demographic information of the participants is given in table 1. Figures from Table 1 shows that 20.33% of the respondents are between the ages of 25 and 35, while 75% falls between 36 and 50, 16.67% are 50 years and above. It also showed that 33.33% of the respondents are female while 66.67% are male. 9.58% of the respondents are first degree while 68.75% of the respondents are masters degree holder and 21.67% of the respondents doctorate degree holders 8.33% of the respondents have spent 1 to 10, 66.25% have spent 11 to 20 years, 20.83% have spent 21 to 30 years, while and 31 years above respectively in the teaching service. 58.33% of them have spent 11 to 20 years while 25% of them have spent 21 to 30 years, while 4.58% have spent 31 and above years in colleges of education as lecturers.

Table 1: Demographical information of Respondents

Item	Factor	Percentage
AGE	Age in years	Percentages
	25 -35	20 (8.33%)
	36 – 50	180 (75%)
	50 and above	40 (16.67%)
SEX	Sex	
	Male 160	160 (66.67%)
	Female 80	80 (33.33%)

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Educational qualification	First degree/HND	23 (9.58%)
	Masters degree	165 (68.75%)
	Doctorate degree	52 (21.67)
Years of Experience	1 – 10	20 (8.33%)
	11- 20	159 (66.25)
	21 – 30	50 (20.83)
	31 and above	11 (4.58)

Research Question 1: Are the lecturers aware of the roles of ICT for teaching/learning?

In order to answer the first research question on lecturer’s awareness on the role of ICT for teaching and learning, their responses to items in the section B of the questionnaire were pooled together for analysis using simple percentage. The result obtained is presented in table 2

Table 2: Awareness of Use of ICT for Teaching and Learning

SEX	N	Percentage
MALE	160	33.90%
FEMALE	80	7.40%
TOTAL	240	100%

As shown in table I above, all the respondents have poor perception on the roles of ICT for

Teaching and learning in the colleges of education. This revealed a percentage score of 33.90%, 7.40% by males and female respectively.

Research Question 2: How available are ICTs facilities in schools for the purpose of teaching and learning?

The analysis as it applies to the above research question is as shown on Table 3

Table 3: Availability of ICT Facilities in Schools

s/n	Statements	YES	%	NO	%
1	There is computer in my college	230	95.83	10	4.17
2.	My college has educational Software for teaching	30	12.50	210	87.50
3.	Our computers are connected to the internet	200	83.33	40	16.67
4.	We have interactive Boards in our colleges	40	16.67	200	83.33
5.	There are Television sets that we use for teaching	50	20.83	190	79.17
6.	We have enough printers	110	45.83	130	54.17
7.	There are photocopiers in my college	150	62.50	90	37.50
8.	Multimedia facilities are available for teaching	30	12.50	210	87.50
9.	We have enough projectors in our classrooms	18	7.50	222	92.50
10.	We have virtual library	7	2.92	233	97.08
	Total= 2400	725	30.21	1675	69.79

The results in table 2 are on the availability of ICT facilities in secondary schools. Results showed that ICT facilities are not available, with items 1 to 10. That is 30.21% of the lecturers answered yes while 69.79% answered no to the 10 items. Although 95.83% said there are computers in the college they do not have enough computers. The study showed that none of the school covered in this study have interactive boards, multimedia facilities and virtual library. 12.50% of respondents said that they have educational software, 20.83% television set and 45.83% printers, while 83.33% of the respondents said their computer systems are connected to the internet. 62.50% of the respondents said they have photocopiers in their schools.

Research Questions 3: Do Lecturers use ICT in Teaching?

The Table 4 shows results for the analysis of the research questions stated above.

Table 4: Lecturers Use of ICT Facilities

S/n	Statements	YES	%	NO	%
11.	I can boot the computer	170	70.83	70	29.17
12.	I use the computer to teach my students	75	31.25	165	68.75
13.	I use the computer to keep records	36	15.00	204	85.00
14.	I use Microsoft Word to type questions and other documents	189	78.75	51	21.25
15.	I use Microsoft Excel to teach basic mathematics	25	10.42	215	89.58
16.	I use Power point in presenting my lessons	47	19.58	193	80.42
17.	I browse the internet to get materials for teaching	125	52.08	115	47.92
18.	I have an e-mail address	210	87.50	30	12.50
19.	I can use a search engine such as Google	132	55.00	108	45.00
20.	I use education software such as CAI for teaching	14	5.83	226	94.17
21.	I can set up a database using MS Access	52	21.67	188	78.33
22.	I can use a scanner to copy images	87	36.25	153	63.75
23.	I can operate a printer that is connected to the computer	120	50.00	120	50.00
24.	I can set up a multimedia projector	45	18.75	195	81.25
25.	I can camera	67	27.92	173	72.08
26.	I can use back up devices	209	87.08	31	12.92
27.	I can analyze data with computer	176	73.33	64	26.67
Total =4080		1779	43.60	2301	56.40

The Table 4 provides the answer to the research question 3. 43% of the lecturers can use ICT in the college of education covered by the study. 70% of the respondents can boot the computer. 31.25% of them use the computer to teach their students. 15% use the computer to keep records and 10.42% use Microsoft Excel to teach basic mathematics, while 78.75% use Microsoft word to type their questions and other document. 52.8% of the respondents get their teaching material from the internet, 87.50% have e-mail address, so it means 87.50% of the respondent use the computer to send and receive mail. 55% of the respondents can use a search engine, while 5.83% of them use educational software such as CAI for teaching. 36.25% of the sample can use a scanner and 18.75% can also set a multimedia. 50% of the respondents can print

using a printer. The study showed that 19.58% of the respondent use power point and Microsoft Access.

Research Question 4: Do lecturers in colleges have the needed experience and competence in the use of computers for educational purposes?

The Table 4 provides answers to the research question 4. 56.40% of the lecturers cannot use ICT in the college of education covered by the study. Specifically, 29.17% of the respondents cannot boot the computer. 68.75% of them cannot use the computer to teach their students. 85% cannot use the computer to keep records and 89.58% cannot use Microsoft Excel to teach basic mathematics, while 21.25% cannot use Microsoft word to type their questions and other document. 47.92% of the respondents cannot get their teaching material from the internet, 12.50% have no e-mail address, so it means 87.50% of the respondent use the computer to send and receive mail. 45% of the respondents cannot use a search engine, while 94.17% of them cannot use educational software such as CAI for teaching. 63.75% of the sample can use a scanner and 81.25% cannot also set a multimedia. 50% of the respondents cannot print using a printer. The study showed that 80.42% of the respondent cannot use power point and Microsoft Access.

Research question 5: Sex influence on Use of ICT

Table 5: Does Sex of Lecturer Influence ICT Use In Colleges Of Education?

S/n	Statements	M	F	M	F
11.	I can boot the computer	120 (5%)	50 (20.83%)	60 (25%)	10 (4.17%)
12.	I use the computer to teach my students	50 (20.83%)	25 (10.42%)	110 (45.83)	55 (22.92%)
13.	I use the computer to keep records	30 (12.5%)	6 (2.5%)	130 (54.17%)	74 (30.83%)
14.	I use Microsoft Word to type questions and other documents	144 (60%)	45 (18.75%)	16 (6.67%)	35 (14.58%)
15.	I use Microsoft Excel to teach basic mathematics	23 (9.58%)	2 (0.83%)	137 (57.08%)	78 (32.5%)
16.	I use Power point in presenting my lessons	40 (16.67%)	7 (2.92%)	130 (54.17%)	63 (26.25%)
17.	I browse the internet to get materials for teaching	100 (41.67%)	25 (10.42%)	50 (20.83%)	65 (27.08%)
18.	I have an e-mail address	160 (66.67%)	0 (0%)	30 (12.5%)	50 (20.83%)
19.	I can use a search engine such as Google	110 (45.83%)	22 (9.17%)	50 (20.83%)	58 (24.17%)
20.	I use education software such as CAI for teaching	10 (4.17%)	4 (1.17%)	150 (62.5%)	76 (31.67%)
21.	I can set up a database using MS Access	45 (18.75%)	7 (2.92%)	115 (47.92%)	73 (30.42%)
22.	I can use a scanner to copy images	53 (22.08%)	34 (14.17%)	107 (44.58%)	46 (19.17%)
23.	I can operate a printer that is connected to the computer	100 (41.67%)	20 (8.33%)	60 (25%)	60 (25%)

24.	I can set up a multimedia projector	33 (13.75%)	12 (5%)	127 (52.92%)	68 (28.33%)
25.	I can use camera	60 (25%)	7 (2.92%)	100 (41.67%)	73 (30.42%)
26.	I can use back up devices	150 (62.5%)	10 (4.17%)	10 (4.17%)	70 (29.17%)
27.	I can analyze data using computers	155 (64.58%)	26 (10.83%)	5 (2.08%)	54 (22.5%)
	Total =4080	1383 (33.90%)	302 (7.40%)	1387 (34%)	1008 (24.70%)

Table 5 shows that more male lecturers use of ICT in teaching and learning than their female counterparts. 33.90% of the male lecturers use ICT, while 7.40% of the female lectures used ICT for teaching and learning. In other words, 66.1% of the total number of male lecturers do not use ICT for Teaching and learning, while 92.6% of the total number of female lecturers do not use ICT for teaching and learning in college of education.

Discussion

The result of this study shows that ICT facilities are not readily available in the schools covered by this study.

It also shows that most of the schools are not connected to the internet. Schools with computers do not have the relevant educational software required by their students. In addition, the computer available in these schools cannot meet the need of the large population of students in these schools. Some schools with internet connectivity may have been cut off because they have not been able to pay their access fee. The findings of this study are in line with that of Fakeye (2010) that most schools in Nigeria are ill equipped for the application of ICT.

The study also showed that most lecturers in colleges of education do not use ICT in teaching students, for administrative purpose and for their personal purpose. It observed that most of these lecturers lack the knowledge, competence to use ICT to facilitate teaching-learning process. This Fakeye (2010) attributed to non availability of ICT facilities. He believed that the non availability of these facilities greatly hinders access and inadequate training of teachers on the use and application of the computer. The study also showed that sex of lecturer may have effect of the use of ICT in colleges of education and the male having advantage over the female.

Conclusion

From the study it was concluded that ICT facilities are not readily available in our colleges of education and that there is low level of ICT utilization in colleges' education where they are available. The low utilization may be as result lecturers lack the basic skill to use the computer and other ICT devices.

Recommendations

Based on the findings, it is however, recommended that:

1. Government should ensure that ICT facilities are provided in colleges of education. Education Trust Fund should be involved in the procurement of ICT devices.
2. Government should enforce the implementation of ICT curriculum colleges of education with a view to incorporating the use of computer and ICT assisted instruction in the teaching and learning process.
3. Lecturers' colleges of education levels should be trained on the use of ICT facilities through regular seminars and computer literacy workshops to keep them abreast of computer and ICT based instruction.

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