Perceived Roles of Information and Communication Technologies in the Implementation of Continuous Assessment in Nigerian Secondary Schools.

INTRODUCTION

Education in Nigeria is an instrument "par excellence" for effecting national development (FGN, 2004; revised), and harnessing the potentials of the citizens. The country's vision is for a complete transformation of all aspects of the nation's life over time. Education should therefore be able to effect inter and intra generational transmission of our cherished heritages and life invention. It should reposition Nigeria's global status in science and technology in all spheres of life.

Society is dynamic and education being a micro unit of society has to change in line with social changes (Udofia, 2005). One of such major transformations that have taken place globally is the introduction of information and communication technologies (ICT) into every facet of human endeavor, and for education not to be caught off guard; it has to integrate ICT into all aspects of the schools curriculum from planning to evaluation. There have been several studies on the use of ICT (Computer) in teaching and learning at various levels. During the last decades ICT (Information & Communication Technology) has become a vital component in schools and schooling (Pelgrum & Anderson, 1999); and Nigerian institutions should not be left out in this quest for a technologically-driven economy. ICT implementation has affected schools' functioning at multiple levels: new configurations of learning spaces and timetables have been created; innovative teaching methods have been incorporated; autonomous and active learning processes using technology have been adopted; teachers' traditional roles have been expanded, including personal and group tutoring and guidance functions; and new ICT-based curricular solutions have been generated (Venezky & Davis, 2002).

The wide use of Information and Communication Technologies (ICT) has been a topic of discussion and concern all over the world, hence, educational systems around the world are under increasing pressure to utilize the new information and communication technologies to teach students the knowledge and skills they require in the 21st century. Some writers also reported on researches which compared the effects of (CAI) Computer Assisted Instruction alone with those produced by conventional instruction alone. Some of these reports found CAI superior, some found conventional instruction superior while others have found no difference between them (Capper and Copper, 1985; Rapaport and Savard, 1980).

The outcome of the school curriculum depends so much on the effectiveness of the assessment and evaluation system put in place by the stakeholders in the public schools. This explains the introduction of the continuous assessment by the Government in all public schools instead of leaving a one-in-all summative evaluation at the end of the academic program. Continuous assessment as a system of school examination was introduced nationwide in 1982 following the restructuring of the Nigeria school system. The basis for continuous assessment can be seen in the National policy on Education (FGN, 2004; revised) which states that "assessment and evaluation at all levels of education will be liberalized by raising them in whole or in part on continuous assessment of the progress of the individual".

The recognition of the important role player by evaluation made every nation (including Nigeria) to persistently strive to incorporate an objective and comprehensive evaluation

procedure into her educational system. This was why Nigeria adopted the use of continuous assessment after realizing the flows in the "one shot" examination system this was stipulated in the 1981 education of the NPE and kick started in 1982

Hence, continuous assessment was defined by the federal ministry of education science, and technology as a 'mechanism where the final grading of a student in the cognitive affective and psychomotor domains of behaviour takes account of all his performance during a given period of schooling. It is a technique of determining the learners' achievement in cognitive affective and psychomotor domains taking into account all their scores in tests, assignments, projects, interviews, sociogram and so on during a school term session or programme (Unachukwu & Onunkwo 2004).

If effectively conducted by teachers, continuous assessment is expected to give teachers greater involvement in the overall assessment of learners, to provide more valid assessment of learners' ability and performance to make teachers become more flexible and innovative in their instruction and to improve on their instructional strategies and more importantly to reduce examination malpractice as is the bane of the one-shot /one-in-all summative evaluation.

According to Obioma (1992), continuous assessment has tended to run into logistics problems since its inception, and one of these is comparability of assessment scores in schools. It has been observed that continuous assessment by teachers is susceptible to irregularities resulting from award of marks on tests not conducted, non use of tables of specification for test items, setting of easy questions items that can easily be marked, and giving students tests to mark and record (Unachukwu & Onunkwo, 2004).

It was the recognition of these irregularities perhaps led to the drastically reduction in the weight (percentage) allotted to continuous assessment (C.A) generated by schools in the Junior Secondary and Senior Secondary School Certificate examinations, because these scores could not be used in making valid and reliable decisions.

It becomes imperative therefore to seek for ways of integrating the information and communication technologies into this phase of the curriculum process as a capable tool in redressing the various flaws inherent in the continuous assessment conducted by subject/ class teachers. This arduous task was the driving force for this study.

Definition of Key Terms in Assessment
- Assessment item: A component of an assessment pattern completed as a unit by students (e.g. a 2-hour examination). The item may contain more than one form of assessment (e.g. an examination with multiple choice questions and essay questions).
- Assessment pattern: the collection of forms of assessment, their weightings and the timing of completion used in assessing the objectives of a subject.
- Assignments: Components of assessment that are normally submitted from work conducted during the semester. Assignments can be formative or summative and of many forms (essays, short answer questions, computer programs, etc.).
- Continuous assessment: An assessment pattern containing more than one assessment item with at least one item due for completion within the semester.
- Criterion-referenced assessment: Where a student's level of performance is judged in terms of how well he/she achieves the objectives of the subject. The judgement does not depend at all on the performance of other students in the subject.

- Feedback: Information returned to students on their progress in their course/subject. The information can be in the form of marks or grades, and/or qualitatively in the form of comments, model answers, suggestions for reading, etc.
- Final examination: A test, quiz, essay paper, etc. set for students to complete in the official examination period at the end of each semester. Final examinations can be formal or informal.
- Formal Examination: An assessment component conducted through the Academic Registrar.
- Formative assessment: Designed to give students feedback on their progress towards the development of knowledge, understanding, skills and attitudes rather than assessment for marks or grades which are not given to students.
- Grade: A symbol associated with the quality of a student's work. Recommended grades for use at UTS and descriptions of the qualitative relation between student work and the grade is presented in the UTS Assessment Procedures Manual. (see also interim result).
- Informal Examination: An assessment component conducted by the lecturer/subject co-ordinator through the School, either during the semester or in the official examination period at the end of the semester.
- Mark: A numerical value associated with the quality of a student's work.
- Meaningful learning: Learning from which students develop personal meaning. Learning from which students have understood the information they are learning rather than memorising it specifically for the purpose of passing assessment tests.
- Norm-referenced assessment: Where a student's level of performance is judged in terms of how well that student achieves relative to other students in the subject.
- Objectives: What the subject/course is trying to achieve. The criteria against which a student's performance in that subject/course will be judged.
- Reliability: The extent of the variation between grades or marks when any assessment item is graded or marked repeatedly. Assessments with low reliability provide marks or grades which depend largely on chance events.
- Scaling marks: When combining marks from different assessment components, the spread of marks on each component should be the same. This is achieved by scaling the marks on the components. One method of scaling the marks is to give the lowest mark zero and the highest mark 100, then determine all other marks by a straight line conversion graph.
- Standardised: The conditions for the assessment task are the same for all students. Most commonly for examinations
- Subject outline: A description of the subject containing objectives for the subject, outline of the content, assessment details and how they relate to objectives, set texts and related readings.
- Summative assessment: Assessment designed to be used to determine grades or marks.
- Supplementary assessment: A second chance assessment component for students who just fail an original component.
- Supplementary examinations: A second chance assessment component for students who just fail the final examination.
- Validity: Whether a test measures the ability being measured, or some different related or unrelated ability.

- Wholistic: Assessing the combined knowledge and skills of students.
(Source: *http://www.iml.uts.edu.au/assessment/glossary.html*)

Types of Assessment

According to Stiggins (2005), there are several kinds of assessment which facilitates effective teacher-learning process. These assessments form part of the continuous assessment process that could be used in the schools to determine students' understanding, knowledge, performance levels and success in the educational sector. The author stressed that examinations and assignments are the two most commonly used approaches to assessment in education, particularly higher education; adding that negotiated and computer-based assessment are emerging approaches that are gaining popularity among some disciplines. The following are among the types of assessment (Stiggins, 2005):

Examinations - It is a common misconception that examinations are a type of assessment rather than an approach. An examination defines the conditions under which students abilities will be tested. They usually restrict the time and place where the assessment task will be performed. Any of the methods of assessment below can be taken under examination conditions.

Assignments- Assignments are unsupervised pieces of work that often combine formative and summative assessment tasks. They form a major component of continuous assessment in which more than one assessment item is completed within the semester. Any of the methods of assessment below can be set as assignments although restrictions in format, such as word limits and due dates, are often put on the assessment task to increase their practicality.

Negotiated- Negotiated assessment involves agreements between staff and students on issues associated with learning and assessment. The most common negotiation method is to develop a written learning contract that outlines the conditions of assessment.

Computer-based - Using computers to administer student assessment can provide flexibility in the time, location or even the quesions being answered of students. The most common type of computer-based assessment is based on multiple-choice questions which can assist lecturers manage large volumes of marking and feedback.

Different methods of assessment provide the means of ensuring that students are able to demonstrate the range of their abilities in different contexts. Stiggens (2005) groups the different methods of assessment into 4 main categories: Selected Response; Essays; Performance

Assessment and Personal Communication - Each category has advantages in assessing different learning outcomes. For example, a selected response assessment task, such as a series of multiple-choice questions, is able to assess all areas of mastery of knowledge but only some kinds of reasoning.

Furthermore, Stiggins (2005) discussed *Alternative assessment* methods which could be viewed as *Selected Responses: examples -*

Multiple-choice Questions (MCQs) are a subset of what are referred to as "objective questions". Objective questions are questions which have a correct answer (usually only one). The term "objective" here means there is complete objectivity in marking the test. The construction, specification and writing of the individual questions (items) are influenced by the judgements of examiners as much as in any other test.

The objective test is largely used to test factual material and the understanding of concepts. Because of the objectivity and ease of marking it is frequently used for testing large groups. It is claimed that skilled items writers can develop items to test higher level intellectual

skills (Cannon and Newble: 1983) but if the perception of students is that these types of questions usually test the recall of facts, then they will prepare for them accordingly.

Short-answer Questions: A large proportion of assessment items make use of short answer questions of some form (in assignments, quizzes, examinations, laboratory tests). These questions vary in expected student response from one word or several lines to over a page, and include forms such as complete the sentence, supply the missing line, problems and exercises in science-based subjects, short descriptive or qualitative answers, essay plans, diagrams with explanation, etc.

Essays: Standard forms of essays require students to:

Discuss a quotation; or,

Write an essay on ....;or,

Describe, Give an account of, Compare, Contrast, Explain ....; or,

Assess, Analyse, Evaluate ....

While these types of questions give students the freedom to choose what they will concentrate on and to structure their work themselves, they may also leave the weaker students in some dilemma as to what is required. In addition to these types of questions there are a range of alternatives which can be employed to fulfill certain roles or suit different objectives. Three of these are briefly outlined below. These and other variations appear in Gibbs, Habeshaw, and Habeshaw, (1986).

Poster presentation: In recent years, presentation of posters has become a regular feature of conferences in most areas of science and technology. These can be used for assessment of parts of students' laboratory work and, at the same time, introduce the idea of conference posters. Design of experimental investigations is one of the most important parts of laboratory work. Posters would be a good way for individual students or groups to display their designs. Posters could also be useful for displaying the results of an investigative project.

(Originally published in Trigwell, K. (1992). Information for UTS staff on Assessment. Sydney: UTS Working Party on Assessment).

Written reports: These are probably the most conventional forms of assessment of students' laboratory work. Reporting mirrors an important activity in the careers of many UTS graduates and plays a useful role in building an appreciation of the ways in which people in those careers work and in the socialisation of students. The main cautions needed are to realise that both are indirect techniques and that both are post hoc reconstructions (the same is often said of scientific publications but in student cases, present a need for checking what actually transpired in the classes (Stiggins, 2005).

Statement of problems

There have been several reports of decline in students performance in various subjects in the school system, also, accusing fingers are raised towards different bodies saddled with the responsibilities of evaluating the school at various levels; the teachers, WAEC, NECO, JAMB etc. The dissatisfaction with the outcome of evaluation carried out by these bodies explains the introduction of screening tests for products of these examination bodies by the universities before admission.

In order to give credibility to the evaluation process within school system, it becomes pertinent to seek other forms of evaluation devoid of bias and favoritism.

This study therefore seeks to establish the roles of ICT in implementing continuous assessment in secondary schools as perceived by teachers and school managers.

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

i. What is the teacher perceived role of ICT for Continuous Assessment?

ii. What is the awareness level of secondary school teachers on the use of ICT for continuous assessment in schools?

iii. What is the awareness level of secondary school managers on the use of ICT for continuous assessment?

iv. Is there a gender difference in the awareness level of teachers?

v. Is there a gender difference in the awareness level of School Managers?

vi. Is there a significant difference between the awareness level of school managers and teacher in the roles of ICT for continuous assessment?

vii. Are there adequate resources for employing ICTs for continuous assessment in schools?

Research Hypotheses
The following null hypotheses were tested in the study:

Ho1   There is no significant gender difference in the awareness level of teachers in the roles of ICT for assessment

Ho2   There is no significant gender difference in the awareness level of School Managers in the roles of ICT for assessment

Ho3   There is no significant difference between the awareness level of school managers and teacher in the roles of ICT for continuous assessment

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

It will also help in gaining credibility for the teachers and products of the school system. It will also 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 of the study
The target population of the study comprised of secondary schools in Lagos State while the accessible population comprised of secondary schools in five Local Government Areas (LGAs).

Sample and sampling technique
A total of 20 secondary schools were selected from all secondary schools in the five LGAs. In selecting the 20 schools, names of all secondary schools in the LGAs were written on strips of papers out of which four schools were picked at random in each of the five LGAs.

In each of the selected schools, the principal, a vice principal and ten (10) teachers were randomly selected and used in the study to give a total of two hundred and forty (240) subjects

Instruments for Data Collection

The main instrument for the study is a self developed questionnaire for teachers and school managers. The questionnaire is divided into two sections. **Section A** sought information on the background of respondents. This information includes the name of the school, Status of respondents, gender, qualification and level of computer literacy. **Section B** sought information on respondents' opinion on the roles of ICTs in the implementation of Continuous Assessment in Secondary Schools. It has 10 items which follows the four point's Likert scale of Strongly Agree, Agree, Disagree and Strongly Disagree. It required respondents to tick appropriately in the provided spaces their level of agreement with each of the ten items. The questionnaire was subjected to criticism by colleagues before for correction and contribution, to ensure face and content validity while its reliability was found to be 0.76 using test re-test reliability methods.

Procedure for Data Collection

All the selected secondary schools were personally visited by the researchers for permission and necessary arrangements with the subjects used in the study. 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 and test hypotheses raised in the study. Descriptive statistics; simple percentage, frequency counts and inferential statistics of t-test was employed in the study..

Results
Perceived role of ICT for Continuous Assessment

In order to answer the first research question on teachers' perceived role of ICT for Continuous Assessment, their responses to items in the section B of the questionnaire were pooled together for analysis using mean, simple percentage and standard deviation. The result obtained is presented in table I below:

Table I: Perceived Roles of ICT

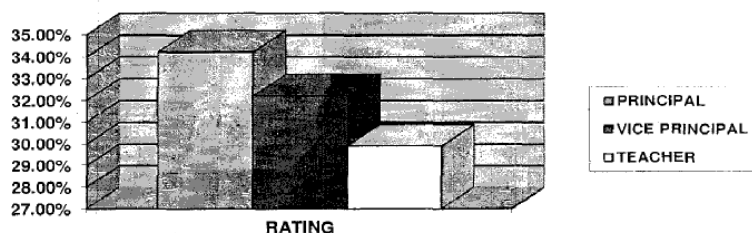| POSITION	N	Percentage Rating	Mean
PRINCIPAL	20	34.2%	13.69
VICE PRINCIPAL	20	32.2%	12.87
TEACHER	200	29.9%	11.95

Fig. 1: Perceived role of ICT for Continuous Assessment

As shown in table I above, all the respondents have poor perception on the roles of ICT for conducting continuous assessment in secondary schools. This revealed in the rating score of 34.2%, 32.2% and 31.3% by principals, vice-principals and teachers respectively.
Awareness level on the use of ICTs for continuous assessment

Table II: Awareness Level

POSITION	N	Percentage	Mean
PRINCIPAL	20	23.7%	14.2692
VICE PRINCIPAL	20	28.2%	13.7813
TEACHER	200	48.1%	12.1452

As shown in table II above, the principals and vice principals have low awareness on the roles of ICT for conducting continuous assessment in schools while the teachers have average awareness on the roles of ICT for conducting continuous assessment in schools. This is also shown in fig. 2 below:
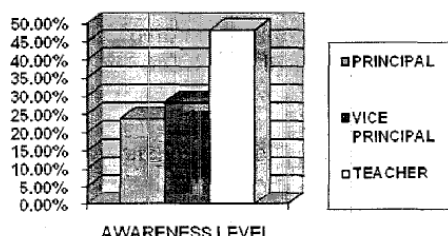

AWARENESS LEVEL

Fig. 2: Awareness level on the use of ICTs for continuous assessment

Adequacy of Resources for employing ICTs for continuous assessment in schools
Responses to related items on the adequacy of resources for employing ICT for continuous assessment in schools were analyzed using frequency counts, mean and simple percentage. The result obtained is presented in table III below:

Table III: Responses on Adequacy of Resources by Position

POSITION	Mean	N	Percentage
PRINCIPAL	2.13	20	53.3%
VICE PRINCIPAL	2.05	20	51.3%
TEACHER	1.33	200	33.3%

From the result in table II above, the principals and vice principals rated the schools average 53.3% and 51.3% respectively in the adequacy of ICT resources, while the sampled teachers rated the schools poor in adequacy of resources for ICT.
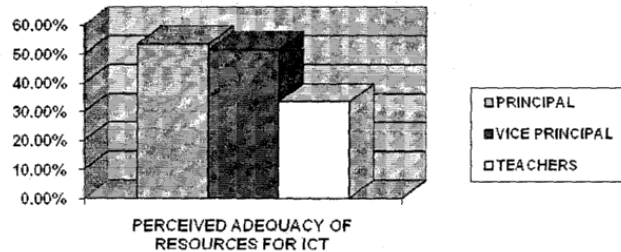
Fig. 3: Adequacy of Resources for employing ICTs for continuous assessment in schools

Testing of Hypotheses

The following null hypotheses were tested in the study:

Hypothesis One

The first null hypothesis of the study states that there is no significant gender difference in the awareness level of teachers for employing ICTs in continuous assessment in schools. This hypothesis was tested by comparing the rating scores of male and female teachers from relevant items on the questionnaire using t-test inferential statistics. The result obtained is presented in table IV below:

Table IV: Awareness Level of Male and Female Teachers

Group	Mean	N	Df	t-stat	t-critical	Decision
MALE	14.58	76	198	0.238	1.999	Not Significant
FEMALE	14.97	124				

From the result in table IV above, the calculated-t is less than t-critical at N1+N2-2 degree of freedom and 0.05 level of significance. This result implied a non significant difference between male and female teachers' awareness level on the use of ICTs for continuous assessment. Therefore, the first null hypothesis should not be rejected

Hypothesis Two

The second null hypothesis of the study states that there is no significant gender difference in the awareness level School Managers on employing ICTs in continuous assessment in schools. This hypothesis was tested by comparing the rating scores of male and female school managers from relevant items on the questionnaire using t-test inferential statistics. The result obtained is presented in table V below:

Table V: Awareness Level of Male and Female Managers

Group	Mean	N	Df	t-stat	t-critical	Decision
MALE	11.26	25	38	2.703	2.00	Significant
FEMALE	13.82	15				

As shown in table V above, the calculated-t is greater than t-critical at N1+N2-2 degree of freedom and 0.05 level of significance. This result implied a significant difference between male and female school manager' awareness level on the use of ICTs for continuous assessment. Therefore, the second null hypothesis should not be accepted.

Hypothesis Three
The third null hypothesis of the study states that "there is no significant difference between the awareness level of school managers and teachers in the roles of ICT in continuous assessment". This hypothesis was tested by comparing the rating scores of school managers and teachers from relevant items on the questionnaire using t-test inferential statistics. The result obtained is presented in table VI below:

Table VI: **Awareness Level of School Managers and Teachers**

Group	N	Mean	Df	t-stat	t-critical	Decision
SCHOOL MANAGERS	40	14.0	238	3.346	1.980	Significant
TEACHERS	200	12.1				

As shown in table V above, the calculated-t is greater than t-critical at $N1+N2-2$ degree of freedom and 0.05 level of significance. This result implied a significant difference between school managers and teachers' awareness level on the use of ICTs for continuous assessment. Therefore, the third null hypothesis should not be accepted.

Discussion of Results
The results of this study generally showed that the sampled teachers and school managers have reasonable awareness on the roles and use of ICT for conducting assessments in schools.

This finding agrees with earlier position that; in recent years major steps were taken in many countries to supply schools with ICT infrastructure (Pelgrum & Anderson, 1999), in the hope that technology will support innovative pedagogies and improve the teaching and learning processes. However, one of the main difficulties concerning the diffusion of innovative ICT-based practices in schools is finding ways to engage teachers and students in using the new technologies effectively (Dodgson & Bessant, 1996).

A similar study by Gray &. Souter (2003) also reported that, relative to other subject teachers, science teachers came out positively with regard to use of and confidence in ICT. Although, the availability of computing facilities was reportedly quite high, the actual level of use was quite low. In addition, where level of use was higher, it was with regard to a rather narrow range of applications, particularly word-processing. In addition, little was reported in the way of pupil use of ICT in science classes.

Although there appeared to be an awareness of the potential for ICT in science, teachers indicated that they did not see the introduction of ICT radically changing the way in which teaching took place, nor changing the teacher-pupil relationship. Science teachers were reasonably confident in their use of ICT but felt that they needed much more in the way of support and professional development to maximize their use of ICT in the classroom.

The result of this study also reveals that the sampled schools do not have adequate resources for employing ICT to carry out continuous assessment. A survey report by Becker (1986) on the instructional uses of computers in United States public and private schools suggested that over one million computers were in American elementary and secondary schools, and that more than fifteen million students used them during 1985.

The report also says that more than half-a-million teachers used computers for instructional purposes during the same period and half of American secondary schools owned at least 15 computers each. Considering the fast pace of ICT in the last 20 years in Europe and America, the figures reported by Becker (1986) must have risen astronomically by now. According to Thomas (2003), the story in Britain is basically the same as that of the USA. This country has been able to keep such pace as a result of government funding through the Local

Education Authorities and the Education Reforms Act of 1988 that compelled the central government to make budgetary provision for education technology. Although the developing countries including Nigeria have become aware of the invaluable role of technology in effective teaching and learning, they have not been able to make significant progress in improving education through this medium.

Conclusions

The following conclusions are hereby drawn:

- Both school managers and teachers are aware of the use of ICT for continuous assessment in secondary schools.

  Though very low, the stakeholders had the opinion that ICT could be effectively used for conducting C.A in schools. Government's gesture (e.g Lagos State) in equipping some schools with ICT equipments and the commercial cybercafés almost in every community had helped in this regard in raising the awareness level of school teachers and administrators.

- That the sampled schools do not have adequate resources for employing ICT for continuous assessment in schools.

  Very few schools were equipped (by Government) with ICT equipments that could be used for C.A exercises. This is coupled with abject lack of financial capability to afford the purchase of needed appliances. These factors led to disparity and the inadequacy in the available ICT resources in schools.

- There is no significant difference between male and female teachers' awareness level on the use of ICTs for continuous assessment. This means that both gender had equal exposure and awareness of the applicability of ICT to human endeavour including education.

- There is a significant difference between male and female managers' awareness level on the use of ICTs for continuous assessment. This in essence means that male school managers are at advantage over their female counterparts on the level of exposure, awareness and consequent use of ICT in education, assessment and evaluation.

- There is significant difference between school managers and teachers' awareness level on the use of ICTs for continuous assessment. Teachers, being the direct implementers of C.A in the classroom, were more aware and convinced of the applicability of ICT to conducting C.A than school administrators who were more interested in their administrative responsibilities than academics.

Recommendations

Based on the results of the study, and to improve the use of ICTs for conducting continuous assessment in schools, the following recommendations are hereby put forward:

- Adequate resources and enabling infrastructure should be made available in schools to facilitate the use of ICTs in the entire schools' instructional programmes
- All stakeholders in the school system should be adequately equipped to utilize ICT for teaching and managing activities in the system
- Regular in-service training programmes should be available to teachers and school managers on how to integrate ICTs in schools.
- Teacher educators and training institutions should review their programmes to include comprehensive ICT training programmes and utilization

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