TRENDS IN INFORMATION AND COMMUNICATION TECHNOLOGY AND LEARNING ASSESSMENT: THE APPLICATION AND IMPLICATION

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Abstract: *This paper presents the current Information and Communication Technologies (ICTs) trends in the field of education and specifically in learning assessment. ICTs make possible for learning and assessments to take place anywhere, whether at home, at the office, or by online distance learning and it has a great potential to enhance learning assessment and to make distribution of learning assessment information affordable and available anytime, anywhere. Various forms of application of ICT in learning assessment, and its implications in educational learning assessment in Nigeria were portrayed. With the creditable benefits of ICT, Nigeria like other countries in the world could reduce challenges facing their educational learning assessment if they employ the ICT trends in assessment.*

Keywords: *ICT, learning assessment, application, implication.*

INTRODUCTION:

The recent developments in information and communication technology (ICT), has a significant change in man's daily activities. Humans have become very much dependent on the ICT to the extent that 78.3% of the developed world's population and 32.4% of the developing world's population are the ICT users (Gul, 2015). These figures are increasing every year. Information and communication technologies (ICTs) are information handling tools that are used to produce, store, and process, distribute and exchange information. These different tools are now able to work together, and combine to form networked world that reaches into every place of the globe (Ihechu & Ugwuoji, 2017). ICTs have certainly affected the field of education positively. According to Ihechu and Ugwuoji (2017), ICT has a great potential to enhance information distribution, teaching, learning, assessment, data evaluation, and managing of educational services. This makes them affordable and available anytime and in anywhere. Therefore, Nigeria like other countries in the world seem to have recognized the important role ICT plays in improving education, and thus invested heavily in ICT by increasing the numbers of computers in schools and in the networking of classrooms.

Education ICT resources include the use of audio-visual materials, projectors, audio-tapes and recorder, video tape recorders, computer and communication devices and so on. Prominent among the educational technology resources is the information and communication devices, which have made possible for learning and assessment to take place anywhere, whether at home, at the office, or by online distance learning (Akinsanmi & Akinsanmi, 2006; Aktaruzzaman, Shamim & Clement, 2011). When used appropriately, different ICTs are said to help expand access to education, strengthen the relevance of education to the increasingly digital workplace, raise educational quality, and help make teaching, learning and assessment into an engaging, active process connected to real life. Research in the use of ICT in education produces convincing evidence of the ICT abilities to assist more effective learning. One of the main advantages of digital education identified is that digital teaching platforms offer students data-rich, and provides an online, synthetic environments, enabled with media, information, and communication tools. Students in such stages become computer-generated in nature and this deepens the students into internet reality that enables them work and learn. In order to enhance their learning capacity, students should be given opportunities for exploration and manipulation within the environment as well as opportunities for academic discussion among themselves (Gulf, 2015; Dickey, 2007).

Integrating ICTs into teaching and learning ultimately offers significant potentials for Nigerian educational institutions and opens new method of learning assessment for educators. Teachers' roles in the integration of ICT in education especially in learning assessment is obviously very important. Cuban (2000) pointed out that every educational reform effort needs to pay attention towards teacher's knowledge and skills in using ICT for classroom assessment. The application of ICT in learning assessment entails assessment of students' educational programme or learning with the aid of ICT resources. That is, learning assessment is electronically administered (e-examination), scored and reported (e-feedback). The advent of electronic assessment of students' learning is a welcome development in the Nigeria educational system. Remarkably, it serves as a way of curbing irregularities associated with the conventional examinations. Aworanti (2013) acceded that, the ability to produce a valid test scores and grades through institutional and public

examinations established for certification purposes is one of the most important challenges of managing educational assessment in Nigeria. Certainly, with an effective virtual learning environments (VLE), it will be possible for the teacher and the learner to obtain feedback, irrespective of class size.

TREND IN ICT AND EDUCATION:

The aggregation of projections from world leading forecasters such as the Horizon Report, gave these top ten global trends in ICT and education as reported by Hawkins (2010) and Fabricante (2013).

Mobile Learning (m-learning):

New advances in hardware and software are making mobile "smart phones" indispensable tools. As cell phones have leapfrogged fixed line technology in the telecommunications industry, it is also possible that mobile devices with internet access and computing capabilities will soon overtake personal computers as the information appliance of choice in the classroom. Consequently, portable computing devices like iPads, laptops, tablet PCs, PDAs, and smart phones with wireless networks enhances flexibility and mobile (movable) learning, thereby letting information access to support wherever, whenever teaching and learning; a data collection and sharing tool; and for delivery of traditional lectures over podcast to extend to places beyond the traditional classroom. Hawkins (2010) gave these two examples of the kinds of applications being developed: (1) a walking tour through time, allowing you to download historical maps to physical locations where you happen to be and listen to an audio tour of a city; and (2) being able to send a text to a Wikipedia linked site with questions and receiving a text answer back on your cell phone. While in the classroom, m-learning according to Fabricante (2013) gives teachers and students increased flexibility and new opportunities for interaction.

Cloud computing:

The term is generally used to describe data centers available to many users over the internet. It supports the first trend, which is the proliferation of cheaper devices for mobile learning, where less power in computing memory is needed. Computer applications are increasingly moving off of the stand-alone desktop computers and increasingly onto server farms accessible through the internet. The implications of this ICT trend for education systems are huge; they will make cheaper information appliances available which do not require the processing power or size of the PC. It also allows for third-party services and technical support, that is decentralized IT support – reducing the need for technical expertise in a specific school or location. It is device- and location-independent. In terms of developing countries, where capacities are thin in terms of technical support, being able to move that support to a third party is extremely useful and cost-efficient. The challenge will be providing the universal connectivity to access information from different sources.

One-to-One computing:

The trend in classrooms around the world is to provide an information appliance to every learner and create learning environments that assume universal access to the technology. Whether the hardware involved is one laptop per child (OLPC), or – increasingly a net computer, smart phone, or the emergence of the tablet, classrooms should prepare for the universal availability of personal learning devices. That is, one computer with internet access per student.

Ubiquitous learning:

Ubiquitous network as seen by Fabricante Jr (2013) is a requirement for pervasive computing and network that emphasizes mobile data access and the mechanisms needed for supporting a community of nomadic users. The goal of ubiquitous world is to trigger a set of requirements for network technologies that seems to be all over the place. Hence, school systems around the world are developing the ability to provide access to computer and network learning opportunities to students that is available anytime and anywhere. In form of distant learning via internet, it involves the opinion that there is a clear direction towards using the internet to open education to students everywhere. The use of the Internet ranges from making course materials available on-line, to using the Internet as the communication tool for the course. (Anderson, 2002).

Gaming:

Gaming online is a technology with a mechanism for connecting players together rather than the regular pattern of computer gameplay. If played over a computer with internet, it has the ability to connect to multiplayer games. A recent survey by the per internet and American Life Project per the Horizon Report found that massively multiplayer and other online game experience is extremely common among young people and that games offer an opportunity for increased social interaction and civic engagement among youth (Hawkins, 2010; Fabricante Jr, 2013). Statistics show individuals spending about three billion hours per week playing games, and that a young person spends around 10,000 hours playing games by the time she or he is twenty-one years of age. Such energy can be channeled into constructive thinking and learning. According to Hawkins (2010), a type of game called 'serious games' has emerged in attempts to address this issue. The remarkable success of games with a focus on students' active participation, built in motivations and interaction suggest that current educational methods are not falling short and that educational games could more effectively attract the interest and attention of the learners.

Personalized learning:

Education systems are increasingly investigating the use of technology to better understand a student's knowledge base from prior learning and to tailor teaching to both address learning gaps as well as learning styles. This focus transforms a classroom from one that teachers and schools are in the middle to one that adjusts content and teaching based on individual student needs – both strong and weak (Hawkins, 2010). Teaching can be tailored to address both learning gaps and learning styles so that teachers and schools can more adequately adjust the learning- content, pedagogy- to the student needs.

Redefinition of learning spaces:

The usual arrangement of classroom- the thirty chairs in a classroom, five rows of six- are quickly becoming a relic of the industrial age. Around the world, schools are looking ahead to the most appropriate learning environments to foster collaborative, cross-disciplinary, and students centered learning. Concepts such as greater use of lights, colours, and circular tables, individual spaces for students and teachers, and smaller open learning spaces for project-based learning are increasingly emphasized. That is, classrooms that will look more like an art galleries and less like prisons.

Teacher-generated open content:

OECD school systems are increasingly empowering teachers and networks of teachers to both identify and create the learning resources that they find most effective in the classroom. Many online texts allow teachers to edit, add to, or otherwise customize material for their own purposes, so that their students receive a tailored copy that exactly suits the style and pace of the course. Teacher-generated open content according Hawkins (2010) is a good service that serves as a teacher-training tool. It provides an opportunity for teachers to collaborate, share information with each other, and learn with each other, thereby creating collaborative networks and communities of practice. These resources in many cases complement the official textbook and may, in the years to come, supplant the textbook as the primary learning source for students. Such activities often challenge traditional notions of intellectual property and copyright.

Smart portfolio assessment:

Through the use of technology, different ways in which to assess how we learn and how we measure learning emerges. Thus, more schools are adopting some of the ICT techniques- like Walmart- so as to be very focused in understanding data, analyzing data, and using data to adjust their pedagogical methods. The concept of a portfolio as a collection of your learning- as opposed to a single examination- provides opportunities to measure the progress of the learner. Hence, learning assessment is increasingly moving toward a more frequent, formative assessment, which lends itself to this real-time data collection, analysis, and reaction, and less on the high-pressure exam as the mark of excellence. Also, tools are increasingly available to students to gather their work together in a kind of online portfolio; whenever they add a tweet, blog post, or photo to any online service, it will appear in their personal portfolio which can be both peer and teacher assessed. The collection, management, sorting, and online retrieving of data related to evaluation and learning certainly helps teachers to better understand learning gaps and customize content and educational approaches.

Teachers as managers or mentors:

With the aid of ICT, teacher's role in the classroom is being transformed from that of the font of knowledge to an instructional manager helping to guide students through individualized learning pathways, identifying relevant learning resources, creating collaborative learning opportunities, and providing insight and support both during formal class time and outside of the designated 40 minute instruction period. The key to the success of this ICT trend in the classroom centers on human factor- the teacher. The willingness of the teacher to change their approach of teaching and the way they interact with both knowledge and students.

These ICT trends are expected to continue and to challenge many of the delivery models fundamental to formal education as it is practiced in most countries. ICT devices have made possible for teaching, learning and assessment to take place anywhere, which is at home, at the office, by online distance learning. Learning can continue into the work place, where there is the need to keep up with current information. To Akinsanmi and Akinsanmi (2006), the concept of knowledge has changed from having information in the brain to having access to information about a particular topic and knowing how to use it. Thus, Teachers' roles eventually have to change, since they will no longer be providers of information, but facilitator of academic skills and technical expertise.

TREND IN LEARNING ASSESSMENT:

The following are the trend in learning assessment:

Internationalization of learning assessment:

National education debates are increasingly shaped by international comparisons, particularly of student performance in international student assessment. These according to OCED (2013) include student assessments conducted by the International Association for the Evaluation of Educational Achievement (IEA) (e.g. Progress in Reading Literacy Skills survey, PIRLS; Trends in Mathematics and Science Skills survey, TIMSS), the OECD's Programme for International Student Assessment (PISA) or UNESCO's Latin American Laboratory for Assessment of the Quality of Education (LLECE). Bonnet (2004) posited that educational evaluation has changed over the years, moving from an essentially national to a more

international perspective. It has also taken a new dimension with the fundamental role it now plays in Europe. With such national developments, countries have started to show interest in comparative evaluation at the international level and Nigeria is not left out. Some education systems who expected to have good performance, have been considerably shaken after publication of international comparative scores.

Elevated importance of evaluation and assessment in education policy:

Evaluation and assessment are increasingly gaining a strategic role as indispensable tools for improvement, accountability, educational planning, and policy development so that new economic and social needs are met. Most developed countries have introduced a wide range of measures intended to improve evaluation and assessment at all levels from the student to the school system itself (Santiago et al., 2012a). These have stimulate public awareness of evaluation and assessment and aid to develop an evaluation culture within school system.

Creation of agencies to govern evaluation and assessment approaches:

The creation of agencies dedicated to the governance of the evaluation and assessment framework deems it necessary to have a specialized expertise, to build adequate capacity that will deliver evaluation and assessment policies and to introduce some independence regarding education authorities. Some functions attributed to these agencies includes technical leadership (e.g. in developing evaluation instruments, guidelines, education indicators), implementation of evaluation and assessment procedures, the monitoring of the education system, the introduction of innovations on the basis of research results, the development of capacity for evaluation and assessment across the system, management of results produced by evaluation and assessment activities and the promotion of an evaluation culture (OCED, 2013).

Similarly, the Nigeria Education Management and Information Systems (EMIS) is mandated to collect, store and process learning assessment information. In addition it should also provide the required and accessible information for education policy-making. Their role is seen as an indispensable tool and support system for the formulation of education policies, their management and evaluation.

Greater variety in the use of learning assessment result as the focal point for analysis:

Student's achievement data are both used to understand the balance between school, student and contextual data and to look at the school processes that appear to support improved achievements (Campbell & Levin, 2009). Some countries, such as the United States, are now using student standardized assessment results as an instrument to appraise individual teachers through the design of value-added models intended to measure the contribution of individual teachers to student learning. Also, as countries place greater emphasis on the monitoring of outcomes in public services, student standardized assessments play an increasingly important role in assessing learning outcomes in school systems especially within a context in which countries demonstrate a growing interest in international benchmarks of student performance.

Evaluation and assessment results serves as a tool for understanding better how well students are learning, for providing information to parents and society at large about educational performance and for improving school and teaching practices. It is used to hold policy makers, school leaders and teachers accountable. There is also a growing interest in using evaluation results for formative purposes (Schildkamp et al., 2012). In addition, assessment result aids students to reflect on and monitor their own progress to inform future learning. Thus, as Hamilton (2003) noted there has been a shift from the use of tests as measurement instruments designed just to produce information to the dependence on tests results to influence policy and instruction.

Greater technological sophistication in learning assessment:

ICT has improved the expansion of assessment as well as the management of the data it generates. Some of the improvements include more individualized assessment approaches, better assessment of cognitive skills such as problem solving, capacity for rapidly marking large-scale assessments, reliability in marking and reduced cost to administer student assessment. Technological advances have permitted student assessment to become more sophisticated, as is the case with computer-based adaptive assessment. For instance, in Denmark, computer-based national tests officially implemented in 2010 are adaptive in that the items are tailored to students' latent ability levels. Test items are selected sequentially according to a student's performance on the previous test items. These efficient national tests provide rapid feedback of test results to teachers the next day, which can greatly facilitate teachers' use of the test results (Danish Ministry of Education and Ramboll, 2012). There are also the growth of rapid assessment- a computer-facilitated approach to frequent assessment, brief formative student assessment, more sophisticated value-added models to determine a school's or a teacher's contribution to student learning, and data information systems providing new opportunities for information sharing across school agents.

APPLICATION OF ICT IN LEARNING ASSESSMENT:

Application of ICT in learning assessment refers to a formative or summative assessment of students learning using the ICT resources like computer. Here, learning

assessment is electronically administered and scored. Application of ICT to learning assessment according to Ihechu and Ugwuoji (2017) can enable educational institutions run courses concurrently, administer lectures or assessment simultaneously, even if they are being delivered in different lecture rooms distant from the actual point of delivery.

Although, Beukes-Amiss and Chiware (2006) observed that in the developing countries like Nigeria there is generally limited access time per month using ICT by both teachers and students, and even less time spent with reliable internet access of which might inhibit the positive effect of ICT on their learning assessment. Additionally, the invention of e-examination is positively accepted in Nigerian education system. As a way of curbing examination irregularities like examination malpractices, delay as well as non-release of examination results especially where there are large classes or public examinations for candidates, some institutions have adopted e-examination for assessing their candidates. For screening of candidates in the Post Unified Tertiary and Matriculation Examination (Post-UTME), most tertiary institutions in Nigeria now use e-examinations.

Adegbija, Fakomogbon and Daramola (2012) cited these Nigerian institutions that have adopted electronic assessment (e-examination) for assessing their candidates:

I.   Joint Admissions Matriculation Board (JAMB),

II.   West African Examinations Council (WAEC),

III. National Business and Technical Examinations Board (NABTEB),

IV.   National Examinations Council (NECO),

V.   National Teachers' Institute (NTI) and

VI.   Teachers' Registration Council of Nigeria (TRCN).

They further recognized the following universities in Nigeria - National Open University of Nigeria (NOUN), University of Ilorin, Ilorin, Federal University of Technology, Minna, Covenant University, Ota (Private), University of Nigeria, Nsukka, University of Lagos, Lagos – as those that are almost fully or partially implementing the e-examination in learning assessment of their students. In line with this declaration, Taiwo and Adewuni (2013) attest to the fact that most tertiary institutions in Nigeria not only adopt e-examination but also accept e-application, e-admission and e-registration. ICT application has equally become a field of study in Colleges of Education, Polytechnics, Monotechnics and Universities in Negeria. The science and technology of it constitutes areas of specialization to many students at undergraduate, graduate and post-graduate levels (Aworanti, 2016).

Also, with the aid of ICT in the tertiary institutions, it is possible for the teacher and the learner to obtain feedback, irrespective of class size. With an effective Virtual Learning Environment (VLE) students' are able to see their performance and note the teachers' comments so as to prepare for the main examination. Teachers no longer obtain feedback in the old method of returning continuous assessments scripts to students. The Essex ICT curriculum advisory team in United Kingdom (UK) developed a folder of leveled indicators of students' progress using ICT. The software enables individuals and groups assess their progress, track and identify targets and generate individual learning assessment reports automatically. This software according to Ihechu and Ugwuoji (2017) could be used to e-mail feedback on students' progress to the child, parent or guardian. Data generated can also be compared between classes within a school.

However, teachers play an important role in the integration of ICT in education particularly in learning assessment. They are expected to ensure that 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. Consequently, Ihechu and Ugwuoji (2017), and Cuban (2000) noted that every educational reform effort need to pay attention towards teacher's knowledge and skills in using ICT for classroom assessment.

IMPLICATION OF ICT ON LEARNING ASSESSMENT IN NIGERIA:

With all the laudable trend and benefits of ICT to the field of education, institutions in a developing nation like Nigeria need to adopt ICT in learning assessment to reduce challenges facing the Nigeria educational assessment system. The challenge of producing a valid test scores and grades for certification purposes. Hence, teachers, educational administrators and learning assessment experts in Nigeria need to become competent with ICT use and be able to keep up with the current ICT trend in educational assessment. Those in the 'corridors of power' should embrace ICT in Nigeria educational system.

CONCLUSION:

ICTs have made possible for learning assessment to take place anywhere, whether at home, at the office, or by online distance learning. In this paper, we discussed trends in ICT and education, trends in learning assessment, forms of application of ICT in learning assessment, as well as its implications in educational learning assessment in Nigeria. There is no uncertainty that giving attention to these ICT trends in assessment by all educational institutions will aid to reduce challenges facing the Nigeria educational assessment system.

RECOMMENDATION:

In view of the current trend in the use of ICT in assessing students' learning, the researchers recommend that there is need for adequate ICT infrastructures for assessing students learning in the classrooms; ICT skilled personnel should be adequately provided for by all examination bodies; authorities of educational institutions in Nigeria should provide their staff with opportunities of attending seminars and workshops on ICT to increase their awareness on current ICT trend and different ways of ICT application in learning assessment.

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