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INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN TECHNICAL EDUCATION.

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ABSTRACT

Despite the belief that Information and Communication Technology (ICT) integration makes impact on the entire educational system, studies directed to ICT in schools have placed too much emphasis on the variables at class level neglecting other areas which ICT are applied. In order to have distributed literature the present paper examines ICT incorporation from the administration perspective. Specifically, the paper reviewed and expatiate literature on ICT in Technical Education which specifically covers an overview of ICT application in Technical Education.

Keywords: ICT, Technical Education, educational system, integration, literature, application, administration, perspective.

INTRODUCTION

Information and Communication Technology (ICT) in Technical Education has been gaining popularity in the academic cycle of the 21st century beyond mere mentioning; its acceptability yielded a variety of recognition and made it one of the 21st century icons that attract researcher's attention (Buntat et al., 2010). Apart from ICT widest acceptability and its application in teaching learning process, ICT is also recognized to make impact in the administrative and management activities in higher education (Horn and Siew, 2011; Hashim et al., 2010).

According to Miller et al. (2006), ICT can be used in schools for administration, planning, lesson delivery and students assignment in the area of teaching and learning. While various researches (Louw et al., 2009) have investigated the factors that augment incorporation of ICTs into teaching and learning process as well as the constraints to the successful integration (Saud et al., 2011), quite few researches are readily available and accessible on students' perceptions of ICT use and their impact on their learning. Consequently, while the interest of educationist and general public on the use and integration of ICT in education is on the increase, studies in this area is still in its infancy, especially that which focus on ICT use in administration and management and which specifically deals with Technical Education and administration. Hence the main thrust of this paper is to analyze the contents and expatiate on the literature from documents (journal articles, textbooks, reports, discussion papers, conference proceedings) written by scholars on ICT application in Technical Education. Specifically, the paper would review literature on: an overview of ICT application in Technical Education, where accounting/ financial administration, students and staff administrative support services are discussed.

THE CONCEPT OF EDUCATIONAL TECHNOLOGY

Educational technology refers to the use of both physical hardware and educational theoretic. It encompasses several domains, including learning theory, computer-based training, online learning, and, where mobile technologies are used, m-learning. Accordingly, there are several discrete aspects to describing the intellectual and technical development of educational technology:

- Educational Technology as the theory and practice of educational approaches to learning

- Educational Technology as technological tools and media that assist in the communication of knowledge, and its development and exchange
- Educational Technology for Learning Management Systems (LMS), such as tools for student and curriculum management, and education management information systems (EMIS)
- Educational Technology itself as an educational subject; such courses may be called "Computer Studies" or "Information and Communication Technology (ICT)"

OVERVIEW OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) APPLICATION IN TECHNICAL EDUCATION

ICTs are indispensable tools in Technical Education. Electronic management (e- management) facilitates decision making in an organization (Hashim et al., 2010). Deployment of ICT in Technical Education as suggested by International Institute for Communication and Development (IICD) "needs to be strengthened in order to manage and plan activities more effectively. Information is mostly in hardcopy format and is not easily accessible. Data about teachers, salaries, student grades, the number of pupils per class, and statistical information in general are scattered and are not readily available" (IICD, 2007). School administrators need to be equipped with knowledge, competencies and should have a deep understanding of educational and social dimension of ICT integration. Educational understanding or dimension includes application of ICT in curricular, technical, management and financial aspects, while social dimension referred to understanding how ICTs are applied in day to day social interaction (Tinio, 2003). ICT should be ubiquitous in educational administrative offices and "mainly helps administrators get a better idea of the size of the educational system, student dropout and repetition, and the number of students per teacher" (Canoy, 2004). Studies on the application of ICT in Technical Education reveals major achievements; a study on the use of e-learning software among future school heads in educational management and leadership reveals that e- headship succeeded in promoting teaching and learning strategies to a higher degree (Moh'd et al., 2009). ICTs help administrators perform school duties effectively (Zain et al., 2004), increase and provide information to the finger tips of administrators (Picciano, 1998; in Gulbahar, 2007) and build very conducive atmosphere for work. Consequently, UNESCO IITE (2011) noted that "ICT facilitates the Technical Education, the provision of learning content and communication between learners and between teachers and learners".

INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN SOME AREAS OF TECHNICAL AND EDUCATION

The use of ICT at the administrative level of any educational setting as discussed in the preceding paragraphs is also evident in TET being part of general education, a programme specially designed to prepare individual for occupational fields. Application of ICTs in administration of TET in the context of this paper will be based on the five out of eight concepts identified by Chinien (2003) in his analytical survey on the use of ICTs in TET. According to Chinien (2003), ICTs have been very efficient and effectively used in TET for the administrative purposes that includes; accounting, staff administrative services, student administrative services, support services, research and evaluation.

Applicability of Information and Communication Technologies (ICTs) in technical and education training (TET) financial administration /accounting. The records of purchases, budget, grants administration, cash flow, audits and other financial transaction carried out by institutions needs proper documentation for reference purposes. These records were kept in hardcopies before the introduction of ICTs. Fortunately, the availability and accessibility of ICTs and their integration in financial sector makes it possible and easy for accountants and financial administrators to process all transaction on-line via the system called an e-accounting. Electronic accounting (e-accounting) as the name implies, makes it possible for transactions to be captured, measured, recognized and reported electronically (Razaee et al., 2001). E-procurement is another new paradigm taking lead into financial administration as a result of development in Information technology. E-procurement according to Bof and Previtali (2010) "is a collective term for a range of different technologies that can be used to automate the internal and external processes associated with the sourcing and ordering process of goods and services". They further states that "On-line purchases and payment for goods and services in virtual markets constitute crucial elements of e-procurement. Successful adoption leads to potential benefits, which include the reduction of transaction costs, operational efficiencies, and a better foundation for decision making". Considering the specialized nature of TET systems, and its peculiarity in terms of requirement for different varieties of training materials or consumables, e-procurement system can fit and be beneficial in dealing with purchases and supply.

This is in line with UNESCO and ILO (2002) recommendations that "administrators should keep up to date with new administrative techniques and trends, especially through relevant

lifelong learning programmes. They should receive special training in the methods and problems associated with the specific features of technical education programmes, such as flexible entry and re-entry patterns, continuous training in the workplace, and relevance to the needs of the world of work.

Applicability of Information and Communication Technologies (ICTs) in students' administrative support services. Students administrative services using information technologies application packages are too numerous to mention in this era of ICT dispensation. Its application into both applied and physical sciences (Rodríguez and Antón, 2011) is evident in the wealth of literature on ICTs. ICTs simplify the administrative support services offered to students in various levels of their academic pursuit in both formal and informal TET, student's services like records, admission/recruitment, class schedules, attendance, registration, time tabling and accessing result can be realized via network of computers and other communication avenues called student portal (Horn and Siew, 2011). The inventory management, personal records maintenance and library systems are areas that are mostly affected in the field of TET. This in essence connected to the peculiar nature of the field and in its desire to prepare workers with certain competencies and employability skills. Facilities management, tools and equipment inventory and workshop schedules make it necessary for TET to deploy and fully integrate ICTs in its day-to-day operations. Students of TET should be able to book for tools and machineries needed to carry out certain experiments online or by using ICTs. Therefore, TET institutions should have to embrace the use of technology in both staff and student's administrative services (Leung et al., 2005). ICT tools such as e-tutor and e-student systems could provide significant atmosphere in the preparation of technical education graduates to face the challenges for the world of work in the 21st century (Seng, 2007). Several ICTs and computer-aided administration application packages highly enriched with current and emerging technologies are readily available and can be found to support student's activities in schools and colleges. Among these latest ICT tools, Radio Frequency Identification (RFID) system appeared to be one. According to Akpir and Kaptan (2010), "RFID is a term that is used to describe a system that transmits the identity of an object or person in the form of a unique serial number, using radio waves. Apart from its numerous applications that cut across human endeavour, RFID application in educational administration include "Automatic Person Identification System (APIS), class/laboratory/library attendance management, static/dynamic authorization, submission of warnings/ announcements and e-money usage" (Akpinar and Kaptan, 2010). The flexibility

and richness of this system.

WAYS IN WHICH TEACHERS USE ICT TO SUPPORT THEIR WORK:

RFID makes it more appropriate and suitable in TET administration, apart from its classrooms application, the system can also be applied to monitor activities in the laboratories. Laboratories/ workshops are central to TET, hence, TET according to UNESCO Institute for Information Technologies in education in (2011) "is concerned with the acquisition of knowledge and skills for the world of work to increase opportunities for productive work, sustainable livelihoods, personal empowerment and socio-economic development for both women and men, in both urban and rural communities and also ICTs are tools in the provision of TET"

Apart from students offering TET courses in schools and colleges, those offering the courses at distance needs support via ICTs in so many ways ranging from registration, result access, documentation, courses information retrieval, inquiries etc. Strong and reliable ICTs network enables students to have access to course material and support services any where any time. Wonacott (2002) states that; "Distance students must rely on secure, easily accessible ICT for clear, detailed information about enrolment, modules, courses, requirements, assessments, expectations, and sources of help; the opportunity to enrol, pay fees, and complete all administrative procedures; regular contact and timely response and feedback from instructors; a variety of methods to communicate with teachers (e- mail, online chat, bulletin boards); enrolment information linked to application forms; and online assessments" (Wonacott, 2002).

Applicability of Information and Communication Technologies (ICTs) in staff administrative support services Staff administrative support services is achievable through effective ICTs integration. Due to the distinct nature of TET system, administration support requires ICT tools embedded in them special features meant to take care of the management of training facilities, tools and equipments both in hard and soft copies. Horn and Siew (2011) notes that ICT tools such as Facility Management System (FMS), File Booking System (FBS), Building Control Management System (BCMS) and Resource Tracking and Management System (RTMS) could help both staff and students to use institution facilities conveniently. Though their study was conducted in universities/Polytechnics/Colleges, it is equally important to acknowledge the use of such ICT tools for administrative support for both students and teachers in an academic cycle. In a related study on the "Primary School

Teachers' use of ICT for administration and management, Selwood (2005) presents list describing the ways in which teachers use ICT to support their work .The implication for TET teachers/staff will be on the aspects of online purchase of goods and services (consumables and repairs) and resources record keeping. Record keeping using ICTs help TET staff especially workshop/laboratory instructors/attendants fast track the movement of tools, equipments and machineries in use by students. This is to avoid double allocation and to reduce the risk of injuries due to congestion in the work spaces. Appropriate safety regulations will also be applied smoothly using appropriate ICT tools in TET. Mumcu and Usluel (2010) observes that teachers in technical schools use ICTs most frequently for managerial purposes and least in teaching learning processes.

CONCLUSION.

ICTs application in TET cannot be overemphasized in the present era when demands in "ICT capability" skills are on the increase. Deployment of ICT tools to support financial services, staff and student's administrative support services in TET institutions have been identified as central elements in attaining the sound education and technical training programme. Emerging ICTs in financial management (e-accounting and e-procurement) and their availability were found to applicable and makes significant impact in the smooth running of organizations financial sectors. Therefore, the deployment of these tools would definitely help TET system financial administrators handle their job effectively, and minimizes error. Due to the unique nature of TET, ICTs application for the support of staff and students administrative services could differ slightly in the way and manner ICTs are applied in general education administration. The differences observed in this paper are on the uses of ICTs to help staff and students in workshop/laboratory scheduling, tracking/monitoring as well as retrieval of tools, equipments and machineries. These services in TET require special systems like RFID and expertise for proper operation.

RECOMMENDATIONS

1. Federal government should ensure that her policy statement regarding the provision of necessary infrastructure and training for the integration of ICT in the school system is effectively implemented, through making certain percentage of its annual budget for the development of ICT industry in Nigeria.

2. Government should encourage IT companies with appropriate incentives to compel them to invest in education and training through certification for tax rebates.

3. Technology vocational education teachers should be encouraged to vigorously pursue ICT training with seriousness. This could be achieved by making computer available, establishing facilities and ensure effective internet connectivity which will provide opportunities to educational leapfrog into the modern era.

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