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Prof. Olorundare

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Prof. Olorundare

Edited by

Prof. Alfred A. Adegoke

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Education Faculties in West Africa (CEFWA) Held at
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Editor

Professor Alfred A. Adegoke

**The LOC for the 2010/2011 Collaboration of Education Faculties In West
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The Use of Information and Communication Technology (ICT) in Teacher Professional Development in Nigeria

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Abstract

The role of Information and Communication Technology (ICT) in the present world of technological age, especially in teachers' professional development, cannot be undermined. This paper examines the concept of ICT, the concept of teacher professional development, the use of ICT in teacher professional development in Nigeria, factors contributing to using ICT in the classroom and causes of low ICT application in teacher professional development. The paper concludes with some recommendations, among which are that employers of teachers and teachers themselves should take advantage of the several ongoing in-service training on ICT by participating with enthusiasm and partnering with organisers to expand the tenure of such training or workshops. Teachers should also inculcate the use of ICT in their professional development, especially in the classrooms.

Introduction

Virtually all stakeholders in education agree that as micro-level practitioners, teachers represent a centripetal force in most educational systems (Egbo, 2011). These are changing times in education system around the world with the start of the new millennium while many societies are engaging in serious and promising educational reforms. One of the key elements in most of these reforms is the professional development of teachers. Societies are acknowledging that teachers are not only one of the 'variables' that need to be changed in order to improve the educational systems but they are also the most significant change agents in these reforms (Eleonora, 2003).

Nigeria started implementing its Information and Communication Technology (ICT) policy in April 2001 after the Federal Executive Council had approved it by establishing the National Information Technology Development Agency (NITDA), the implementing body. The policy empowers NITDA to enter into strategic alliances

and joint ventures and to collaborate with the private sector to realise the specifics of the country's vision of making Nigeria an IT capable country in Africa and a key player in the information society by the year 2005 through using IT as an engine for sustainable development and global competitiveness. This vision is yet to be fulfilled.

Information and Communication Technologies (ICTs) are widely believed to be important potential levels to introduce and sustain education reform efforts. Despite evidence of increasingly widespread use of ICTs in education initiatives around the world, there is little guidance available for policy makers and donor staff specifically targeted at countries contemplating the use of ICTs to help them meet their education-related Millennium Development Goals.

How and how well teachers are prepared for teaching is a critical indicator of education quality. Preparing teachers for the challenges of a changing world means equipping them with subject specific expertise, effective and innovative teaching practices, an understanding of technology and the ability to work collaboratively with other teachers, members of the community and parents (Hooker, 2009).

The Concept of Information and Communication Technology (ICT)

Anderson & Glen (2003) explain the origins of the educational application of the term 'Information and Communication Technology (ICT)', as deriving from previous terms like information technology (IT) and new technologies. They define ICT as generally related to those technologies that are used for accessing, gathering, manipulating and presenting or communicating information. The technologies could include hardware (e.g. computers and other devices), software applications and connectivity (e.g. access to the internet, local networking infrastructure, video conferencing).

From a less technical viewpoint, the term 'information and communication technology (ICT)' refers to the range of technologies that are applied in the process of collecting, storing, editing, retrieving and transferring of information in various forms. The foregoing definition implies that a broad range of technological equipment such as computers, mobile telephones,

MP3/MP4/WMA storage devices, file transfer protocols, satellites, World Wide Web, etc are used for information exchange among people for different purposes. These devices are capable of both synchronous and asynchronous communication formats. The most advanced of these technological applications is the concept of multimedia, which refers to teaching and learning devices that include a combination of data manipulators, e.g. video, CD ROMs, floppy disks, etc which facilitate interactive communication between and among individuals. Given these descriptions of the components of ICTs, it should be clear why ICTs are considered a more robust and all-encompassing phenomenon than the popular narrowly held conception of mere application of computers in human activities (Olakulehin, 2007). According to Chen & Kee (2005) in Olakulehin (2007), information and communication technologies are the backbone of the knowledge economy and in recent years, they have been recognised as an effective tool for promoting economic growth and sustainable development.

Teachers' Professional Development (TPD)

Professional development, in a broad sense, refers to the development of a person in his or her professional role. More specifically, "teacher development is the professional growth a teacher achieves as a result of gaining increased experience and examining his or her teaching systematically" (Glatthorn, 1995, p.41). Professional development of teachers, according to Eleonora (2003), includes formal experiences (such as attending workshops and professional meetings, mentoring, etc) and informal experiences (such as reading professional publications, watching television documentaries related to an academic discipline, etc) as shown in figure 1.



Figure 1: Components of Teachers' Professional Development

Shafika (2006), in Hooker (2009), defines Teachers' Professional Development (TPD) as a systematised, initial and continuous, coherent and modular process of professional development of educators in accordance with professional competency standards and frameworks. Teachers' professional development would also include training in the adaptation to the evolution of change of the profession of teachers and managers of education system.

When looking at professional development, one must examine the content of the experiences, the process by which the professional development will occur and the contexts in which it will take place (Ganser, 2000; Fielding & Schalock, 1985). Only in the past few years has the professional development of teachers been considered a long-term process that includes regular opportunities and experiences planned systematically to promote growth and development in the profession.

Fullan (1987) believes there are four crucial factors for successful teacher development and these are:

- redefinition of staff development as a process of learning;

- the role of leadership at the school level;
- the organisational culture at the school level; and
- the role of external agencies, especially at the local and regional level.

The Use of ICT in Teachers' Professional Development in Nigeria

The recent implementation of technology in the classroom is probably one of the most challenging innovations that many teachers have to confront in the world today and Nigeria in particular. Technology is accessible almost everywhere in the country; the areas where this is not the case are becoming more isolated than ever before.

In societies where majority of the population has access to computers and other technologies (such as in the USA, Canada, Europe and other developed nations), teacher-producing institutions are lagging behind in the contents and skills they are to develop in student-teachers. In addition, a growing number of studies are discovering that both new and experienced teachers feel inadequately prepared to use

computers and other forms of technology in their classrooms (Abdul-Haqq, 1995). This can be seen in the fact that relatively few teachers regularly use computer-based technology in their classrooms and when they are used, it is usually for drills and word-processing or for 'throwing lecture notes' into the computer (Gallant, 2000). It can also be seen in the fact that some schools introducing computers into their classrooms but are offering no training to their teachers on how to use them effectively (Breulex, A.; Baker, P.; & Pagliaroli, G. (1997).

As with all teacher-preparation programmes, learning about technology must be included in the teachers' education (not only in their training) so that, in addition to knowing how to use the tools, they also know how to integrate technology in the classroom in a thoughtful way (Caverly, D. C.; Perterson, C.L.; & Mandeville, T.F. 1997). Otherwise, teachers will simply continue to use the same teaching techniques (lecturing, for example), instead of adding the use of computers (e.g. teachers who, instead of distributing handouts in class, now present it on a computer screen).

New models of professional development that rely heavily on the use of new technology are emerging in the field as well as in the literature. One example is the ePDS or electronic professional development school that emphasises the use of technology in professional

development. Another interesting case is that of the learning collaborative, a technological-based resource for advanced placement of teachers around the world (Padilla, 2000). It includes a website that offers teachers resources for teaching, professional development, mentoring and establishing and maintaining standards of excellence.

The use of ICT in teacher professional development, according to Perraton (2001) cited in Anderson & Glen (2003), involves two sets of activities or roles: one is training teachers to learn about ICT and its use in teaching as computers are introduced to schools while the other is that ICT is a means of providing teacher education, either as a core or main component of a programme or playing a supplementary role within it.

Kirschner & Davis (2003) clarify the distinction between the role of ICT as a core and a complementary (supplementary) technology for professional learning settings. A core technology role refers to the principal way of organising the learning experience. In contrast, a complementary technology role is optional serving a valuable function but able to be compensated for via the core technology if so needed or dropped altogether if not functioning or feasible (Hooker, 2009). A synthesis of the two dimensions of ICT integration combining the roles and activity sets is presented in figure 2.

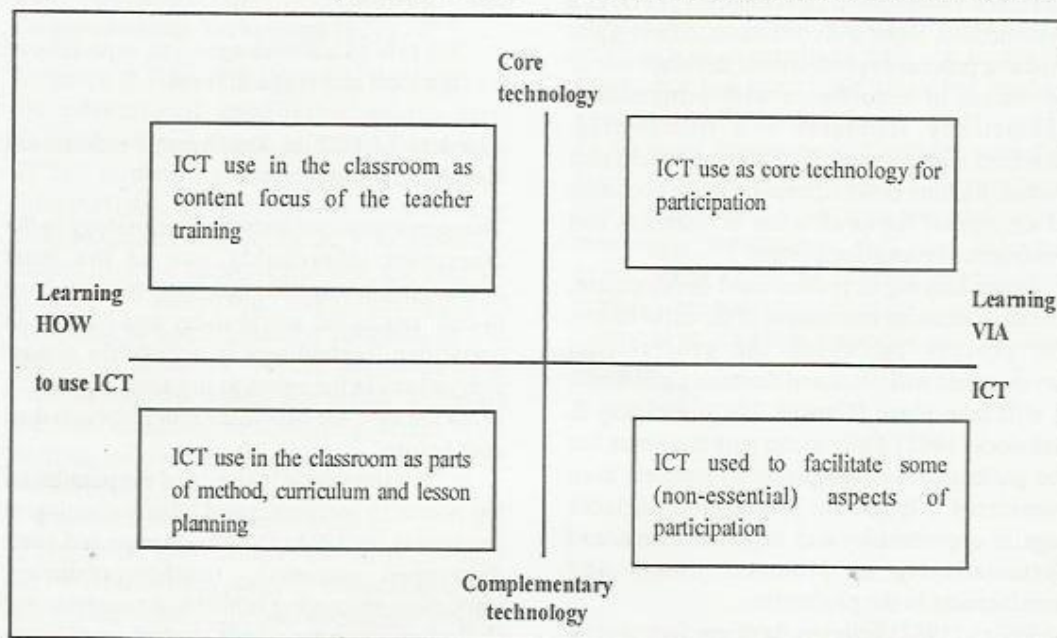


Figure 2. Two Dimensions of ICT Integration in Teachers' Professional Development

Source: Collis and Moonen 2001, cited in Kirschner and Davis, 2003

Perraton (2004), cited in Evoh (2007), suggests that ICTs can be employed in education systems for three purposes: to widen access to education, to raise its quality and to reform it. Pulkkinen (2009) suggests a more systemic or holistic vision for ICT integration and contends that problems of access, quality, efficiency, effectiveness and relevance at different levels of education systems can be solved by different and innovative uses of technology. There is a commonly acceptable rhetoric that education systems need to effect changes in the preparation of its citizens for lifelong learning in the 21st Century knowledge-based or information society and ICTs are engines for new growth and tools for empowering societies to change into knowledge economies or information societies (Burkhardt, 2003).

Butler (2001), in Hooker (2009), contends that new models for TPD represent a 'reconceptualisation' of teacher professional learning for a digital age. The models look beyond how teachers 'engage' with technology to how teachers use technology as they work alongside their students to 'redefine learning itself and to become 'co-learners' in the process.

The UNESCO (2008), in Information and Communication Technology (ICT) Competency Standards for Teachers, go further by describing three approaches of ICT integration in the professional development of teachers: technological literacy; knowledge deepening and knowledge creation. These approaches are seen as part of a development continuum and each approach has different implications for education reform and improvement, plus different implications for changes in the components of the education system in areas of pedagogy, teacher practice and professional development, curriculum and assessment and school organisation and administration.

ICT plays a unique but complementary role in each of these approaches with new technologies requiring new teacher roles, new pedagogies and new strands to teacher education. The successful integration of ICT into the classroom depends on the ability of teachers to structure their learning environments in non-traditional ways, merging technology with new pedagogies. This requires a very different set of classroom management skills to be developed together with innovative ways of using technology to enhance learning and encourage technology literacy, knowledge deepening and knowledge creation. At the knowledge creation

end of the continuum, the curriculum goes beyond a focus on subject knowledge to explicitly include 21st century skills that are needed to construct new knowledge and engage in lifelong learning - the ability to collaborate, communicate, create, innovate and think critically. Teacher development is seen as a crucial component here. It ideally coordinates teachers' sophisticated professional skills with the pervasive use of technology.

Across Africa, Olakulehin (2007) reports that there are a 'deluge of challenges' confronting the educative process in general and the application of ICTs in TPD programmes in particular. While ICT has found its way into the formal curriculum in most educational practices, their existence is embryonic mainly due to a lack of computers, connections and staff expertise. Olakulehin finds it distressing to observe many countries in Sub-Saharan Africa (SSA) 'falling below expectations regarding the use of ICTs particularly in instructional and learning activities' (Olakulehin, 2007:137).

Benchmarking ICT Integration in Teachers Professional Development

• A Model Perspective

Shafika (2006) points to a general absence of conceptual clarity on the objectives of TPD for ICT initiatives in the African region. Mandinach (2005) suggests that the lack of clarity is pervasive in education systems globally, noting that while educational institutions seem to be aware they should be joining the ICT integration movement, they are not clear as to the purpose or the gains. Kirschner, P.; Wubbels, T.; & Brekelmans, M. (2008) note that while much of the literature advocate that teachers should develop ICT skills, there is a lack of discussion on what this actually means or looks like in practice.

From the mainstream literature, Kennedy (2005), in Hooker (2009), proposes defining whether the fundamental purpose of a TPD intervention is to achieve transmission or to facilitate transformative practice that can provide a powerful tool for conceptual analysis. Drawing from the literature, Hooker developed a framework for categorising nine different models of TPD provision along a continuum of delivery inherent in their purposes of provision - moving

from transmission through transitional to transformative purposes which develop increasing capacity for teacher empowerment.

From the ICT domain, Olakulehin (2007) identifies four broad approaches from the literature for the adoption of ICT in TPD programmes. The adoption model depicts a continuum flow of the four approaches correspondent to the Kennedy trajectory - moving from emerging to applying to infusing to transforming purposes which develop increasing teacher and support staff capability to use ICT as a 'natural part of the everyday life of the system' (Olakulehin, 2007: 140).

The UNESCO (2008) Information and Communication Technology - Competency Standards for Teacher's (ICT-CST) project attempts to bridge both mainstream and ICT specialist domains in a holistic framework for a modular continuum of ICT integration in all TPD programmes - moving from technology literacy through knowledge deepening to knowledge creation purposes which develop increasing capacity for teacher empowerment in the utilisation of ICT as a tool to enhance the quality of learning.

• A Benchmarking Perspective

The UNESCO ICT-CST project marked the culmination of many attempts made by governments, academia and the private sector to establish a universal terminology or standards for ICT integration in professional development. One of the more significant studies to prelude the UNESCO project was the research conducted by Kirschner & Davis (2003) to identify pedagogic benchmarks for ICT in TPD on the basis of a review of the literature and a meta-analysis of twenty-six case studies of international programmes of good practice. Benchmarking is a process described by Kirschner et al (2008), through which 'organisations can evaluate different aspects of their processes in relation to best practice with the aim of improving practice'. Within a TPD perspective, the benchmarks can be established as quality standards for validation and certification of TPD programmes.

The results from the Kirschner & Davis' (2003) study demonstrated that the four top benchmarks consistent with the majority of the case studies of good practice are that teachers become competent personal users of ICT,

become competent to make use of ICT as a mind tool, become masters of a range of educational paradigms that make use of ICT and become competent to make use of ICT as a tool for teaching. Other benchmarks, that were considered important but were not present in all the programmes evaluated, are that teachers master a range of assessment paradigms for use of ICT that they understand the policy dimension of the use of ICT for teaching and learning and that effective programmes embed ICT in different content domains as a 'normal' not a 'special' component. The authors remark on how well the benchmarks fit with the literature on emergent standards for ICT integration including the UNESCO holistic planning framework and how well they augur a vision for ICT innovation that catalyses education renewal for the 21st century.

• An Institutional Perspective

Pulkinnen (2009) explains that ICT is more a process than a tool and in the context of ICT innovations, 'ICT innovation is more a new process to be developed than a technology (a tool) to be applied'. Benchmarking ICT innovation in TPD programmes in a meaningful way would require institutions to articulate clearly the new process around which the benchmarks will cohere. Jochems, van Merriënboer & Koper (2004), cited in Hooker (2009), propose that a new process for ICT integration needs to address organisational, technological and pedagogical perspectives. The benchmarks of an institutional technology management plan can be independently developed from the benchmarks of the management plan for teaching and learning. If an institution is unable to establish a coherent relational approach to technology integration that is driven by its policy and vision definition, ICT planning activities may often overlook the needs of students and teachers (Ellis & Moore, 2006). Benchmarking a new process of ICT integration allows an institution to reflect on three fundamental questions in the manner of a reflective practitioner to evaluate how its system is working in achieving its mission for ICT integration and how it can improve. The questions are:

1. What is the quality model underpinning the teaching and learning system? (its theoretical basis)

2. What are the mechanisms in the system that allow the institution to reflect on and improve current practice?
3. What are some of the strategies used to remove impediments to the successful implementation of ICT in the teaching and learning system?

Despite widespread interest in providing schools with computer labs and connecting them to the Internet, it may be that other types of ICTs may be more relevant to the particular circumstances faced by countries struggling to meet MDG targets. For example, it is widely believed that interactive radio may be a particularly cost-effective way of providing regular outreach and support to teachers in these countries, especially as it relates to upgrading (a) teacher subject knowledge and (b) teacher pedagogical practices and especially for remote communities and local language education.

Conclusions and Recommendations

Professional development of teachers in Nigeria is a necessary ingredient for improved students' achievement and ICT is an important tool that can be used to make the various components of teachers' professional development effective. That is, in teachers mentoring, master degree programme, professional conferences, school-based coaching, advanced certification, induction programme, technology training, subject area team meeting, ICT has an important role to play. Therefore, the following recommendations are made:

1. Employers of teachers and teachers themselves should take advantage of the several ongoing in-service training on ICT by participating with enthusiasm and partnering with organisers to expand the tenure of such training or workshops;
2. There is the need to shift from 'Education for ICT' to the use of 'ICT for Education' - a fundamental shift in focus from training teachers for ICT technical skills to supporting teachers in the use of ICT for educational enhancement;
3. There is need to focus on sustainable, resource adequate and ongoing professional development in order to ensure the effective deployment of ICT;
4. Teachers and teacher educators should genuinely 'own' the process of ICT

integration - to enable them to be creative in adapting ICT to their own classroom circumstances; and

5. There is need for ICTs to be integrated across the curriculum in a blended way.

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