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ICT AND TEACHER EDUCATION REFORMS: A RESEARCH REVIEW

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Abstract
In every given society, change is inevitable. The phenomenon of globalisation has ushered in information Communication Technologies and has also created a better avenue for effective teaching. The use of Information Communication Technology would therefore, reform old methods of teaching, help to improve Socrates' method of teaching, and help the teacher as well to become not only a "sage", but on stage involving learners to become active participants in the process of teaching and learning.

Introduction

To sociologists or sociologists of education, the concept of social change or change is prominent to classroom teachers as well as the society at large. According to Onyenuchie, Omorogbe and Omohan (2000) and Ritzer (2000) the concept of change could be attributed to Auguste Comte (1798-1857), Herbert Spencer (1820-1903), Emile Durkheim (1858-1917), Karl Marx (1818-1883), Ferdinand Tonnies (1855-1936) and Sorokin Pitrim (1889-1968). Thus, Heraclitus and Cratylus, the early Greek philosophers concluded that 'everything alters and changes' (Popkin & Stroll, (1981). In the 21st century, the term change could be re-substituted to mean reform. Reform, therefore, means to improve by alterations, correction of error or removal of defects; put into a better form or condition or to change for a better. The question of reforms in the education sector becomes prominent as the world is currently at the scientific stage propounded by Auguste Comte whereby the process of globalisation is propelled by Information and Communication Technologies (ICT). In this age of globalisation, every sector of the society (social system), has been reformed due to the era of globalization revolutionalised by Information Communication Technologies. However, it should be noted that Information Communication Technologies (ICTs) is an aspect of the phenomenon of globalisation. For instance, Torres (2001) argues that globalisation has been driven by the liberalization of international trade; freer capital flows; and manifests itself mainly through an intensification of activities in the following areas:

a. International Trade in goods and services
b. Capital Flows (FDI and short-term flows); and
c. The reorganisation of production networks on the international scale; and the adoption of new technology, notably ICT (p.8).

From Torres' point of view, one can conclude that one cannot discuss ICT without referring to the phenomenon of globalisation, because it is an aspect, which helps to revolutionalise the phenomenon, and helps to play the significant role that brings about changes in every sector of the economy especially in the teaching profession. To this end, Quiggin (2003) succinctly explains that from the 18th century onwards, reform typically implied forming something new. Thus, reforms in teacher education can be described as any given programme of systematic change in institutions with implication of approval for better future.

Teacher Education

The National Policy on Education (Revised Edition, NPE, 2004) recognises the importance of teacher education in Nigeria society. For instance, Section 1.1; Section 2:6,

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Section 3:8, Section 4:12, Section 5:19, and Section 6 subsections 56:27 emphatically explains thus:

(a) Since no education system may rise above the quality of its teachers, teacher education shall continue to be given major emphasis in all educational planning and development; and

(b) The minimum qualification for entry into the teaching profession shall be the Nigeria Certificate in Education (NCE).

Also, the national policy on education, section 6 subsections 57:27 reiterates the goals of teacher education thus:

(a) Produce highly motivated, conscientious and efficient classroom teachers for all levels of our education system;

(b) Encourage further the spirit of enquiry and creativity in teachers; help teachers to fit into social life of community and the society at large and enhance their commitment to national goals;

(c) Provide teachers with the intellectual and professional background Adequate for assignment and make them adapted to changing situations; and

(d) Enhance teacher's commitment to the teaching profession.

In achieving these objectives, teacher educators are professionally trained for all levels of education that is from the pre-primary to University level. In view of this, Osokoya (2004) highlights the following objectives for the sector of teacher education:

1. Developing, assessing and improving educational programmes;
2. enhancing teaching and improving the competence of teachers;
3. Making learning more meaningful for children;
4. Developing and promoting an effective use of innovative materials in schools and
5. Providing educational resource centers, audio-visual aids centers, radio, television etc. (P.47).

From the foregoing discussion, Osokoya (2004) and the National Policy on Education (Revised, (2004) discussed the needs for reforms in teacher education. Okbukola (2002) stresses that looking into the future of teacher education; there is need fro adequate provision of facilities which is the challenge to the attainment of production of qualified teachers as well as access to the Internet which will also shape the character of the students of the future in terms of their academic work. In view of this, Ambasht (2002) supports that the explosion of knowledge, advances in pedagogical science, the use of Information Communication Technology, changes in society concerns, changes in teacher's work situation make it imperative for teacher professional development on a continuing basis. In the same vein, Onocha (2002) opines that quality assurance in teacher education must include relevant curricula, adequate and appropriate materials for literacy, numeracy, knowledge and skills for life as well as quality teaching which should enhance the learning process of application of technology which include ICTs in order to reduce disparities and promote learning among learners.

ICT and Reforms in Teacher Education

Germane to our discussion on the theme, of this conference on 'reforms' in education is the issue to teacher education. Chisenga, (2006) describes Information Communication Technologies (ICTs) as a diverse set of technological tools and resources used to communicate and to create, dissemination, store and manage information and they encompass a wide range of rapidly evolving technologies including telecommunications technologies, such as telephony, cable, satellite, TV and radio, computer-mediated conferencing and video conferencing and digital technologies such as computers, information networks (Internet, the world wide web, intranets and extranets) and software application. In view of this definition, Nwaboku (2006)

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informs that Information and Communication Technologies (ICTs) have not been available in all levels of school system in Nigeria. In the same manner, Plomp and Akker (1995) and Ololube (2006) argue that many Nigerian teachers have been unable to find effective ways to use technology in their classrooms as well as any other aspects of their teaching and learning activities. He argues further that teachers have not been encouraged to become active users nor trained in using ICTs in order to enhance teaching and learning process in the classroom. For effective teaching, through the use of the Internet, Fox (1998) in his study, discovers that, one supportive and potentially motivating outcome pf Internet use, (which also include the Information and Communication Technology) is that students begin to realize that not only is the world connected together through the use of this technology, but as the majority of information on the internet is in English, they begin to appreciate the usefulness of acquiring ESL skills. In the era of globalisation, accumulation of skills for using ICTs is inevitable. To this end, Cogburn (2004) maintains thus:
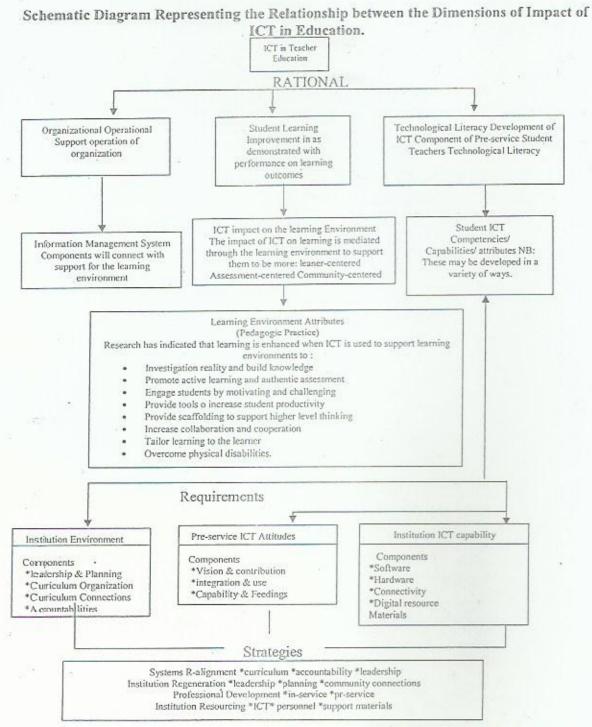
> The globalisation of the economy and its concomitant demands on workforce requires a different or learners to access, assess, adopt and apply knowledge, to think independently, to exercise appropriate judgment and to collaborate with others to make sense of new situations. The objective of education is no longer simply to convey a body of knowledge, but to teach how to learn, problem-solve and synthesize the old with new (p.10).

From the above point of view, one can deduce that the twenty-first century has brought about a reform to teacher education in such a way that instructions are no longer a sage on the stage. Obayan (2004) asserts thus:

> New Information and Communication Technologies have liberalized access to, and dissemination of information and knowledge. They have helped in creating virtual realities, translated into virtual institutions, virtual classrooms, virtual libraries etc. Teachers and students can now access knowledge from cyberspace and use the same medium to contribute to knowledge (p.147).

From the above excerpt, it refers to as digital revolution in the teaching profession for effective teaching in the 21st century. Ian (2004) explains the importance of ICT especially a technology products called Classroom Communication Systems (CCSs). The CCSs are technology products designed to support communication and interactivity in classes. Through the use of this product, for instance, large 'Lecture' classes can function more like small discussions. In other words, the CCSs enhances more learning that the traditional lecture format offers and in learning of a different concept. According to Ian (2004), the Classroom Communication Systems help students to develop a more solid, integrated, useful understanding of concepts and their interrelationships and applicability.

This however, implies that the use of Information Communication Technologies (ICTs) such as the Internet, the CCSs and other electronic gadgets brings about a reform in teacher education, to enhance Pedagogy. The ICT as a reform in teacher education no doubt helps the learners to sharpen their vocabulary, identify flaws in logic as well as enhance students' communication and social skills.

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Schematic Diagram Representing the Relationship between the Dimensions of Impact of ICT in Education.

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                          │ ICT in Teacher  │
                          │   Education     │
                          └─────────────────┘

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Organizational Operational Support operation of organization	Student Learning Improvement in as demonstrated with performance on learning outcomes	Technological Literacy Development of ICT Component of Pre-service Student Teachers Technological Literacy

Information Management System Components will connect with support for the learning environment	ICT impact on the learning Environment The impact of ICT on learning is mediated through the learning environment to support them to be more: leaner-centered Assessment-centered Community-centered	Student ICT Competencies/ Capabilities/ attributes NB: These may be developed in a variety of ways.

Learning Environment Attributes
(Pedagogic Practice)
Research has indicated that learning is enhanced when ICT is used to support learning environments to :

- Investigation reality and build knowledge
- Promote active learning and authentic assessment
- Engage students by motivating and challenging
- Provide tools o increase student productivity
- Provide scaffolding to support higher level thinking
- Increase collaboration and cooperation
- Tailor learning to the learner
- Overcome physical disabilities.

Requirements

Institution Environment	Pre-service ICT Attitudes	Institution ICT capability
Components *leadership & Planning *Curriculum Organization *Curriculum Connections *Accountabilities	Components *Vision & contribution *integration & use *Capability & Feedings	Components *Software *Hardware *Connectivity *Digital resource Materials

Strategies

Systems R-alignment *curriculum *accountability *leadership
Institution Regeneration *leadership *planning *community connections
Professional Development *in-service *pr-service
Institution Resourcing *ICT* personnel *support materials

Source Adapted from Ololube (2006) for furtherance clarification on ICT in teacher education.

From the systematic diagram and according to Ololube (2006), one can deduce that the importances of information communication technologies (ICTs) in teacher education are used for accessing, gathering and presenting communication information to the school system. In view of this, Information and Communication Technology (ICT) is changing the face of education in order to enhance effective teaching.

New Roles for Teachers' Education

Information and Communication Technologies (ICTs) are crucial in the education industry.

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To achieve the benefit(s) of ICT, the pre-service as well as in-service teachers should embrace the phenomenon of ICTs as new pedagogies for effective teaching and learning. In view of this, UNESCO (2002) stresses that to improve learning, Information and Communication Technologies must be put in place which now serves the following conditions:

(a)   Students and teachers must have sufficient access to digital technologies and the Internet in their classroom, schools and teacher education institutions
(b)   High quality, meaningful and culturally responsive digital content must be available for teachers and learners.
(c)   Teachers must have the knowledge and skills to use the new digital tools and resources to help all students achieve high   academic standards.

From all indications it has become paramount for sociologists of education as well as teacher educators to begin to produce teachers who are ICT friendly; well equipped with knowledge and skills and the ability to transmit these values to other generations.

New Roles for Students

The evolution of Information and Communication Technologies has been gaining ground in some parts of the world, although observation has shown that Nigeria is aware of the phenomenon. Hence, students to cope with the rigour of the academics work. Also, the introduction of Information and Communication Technologies (ICTs) would engage students in activities that are beneficial to their academic programme.

New Roles for Stakeholders

Social change is always a global phenomenon; in promoting Information and Communication Technologies integration in teacher education, there is need to make the teacher education programme conform to the image of a some what better future built by the stakeholders. The stakeholders are faced with an enormous task to make available every necessary resources needed to enhance teaching and learning, in order to produced teachers who are interested in effective ways to implement learning.

Conclusion

Form the discussion on the use of Information and Communication Technologies (ICTs) in teacher education, it reveals that reform of education in term of learning is taking place; also, changes in terms of Information Communication Technologies have begun to change the role of teachers, as well as not making them a sage, but on stage in which students too are expected to contribute meaningfully to what have been learnt through the teacher as well as Information Technology (IT) put in place.

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