

# INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) A TOOL FOR HUMAN CAPACITY TRANSFORMATION IN TEACHER EDUCATION IN NIGERIA

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## **Abstract**

*Human capacity is important to any system or organization and Information and Communication Technology is the driving force for its transformation for development in all parts of the global system. This paper examined how Information and Communication Technology can be use to enhance the capacity transformation of teachers in Nigeria. It suggest modalities that may be adopted to achieve these capacity transformation. Teachers are encouraged to reflect on and make decision about their own ICT development needs on an ongoing basis. This will ensure more involvement of teachers; allowing choice and guidance where appropriate for teachers who are at different stages of ICT literacy and a great integration of ICT within the teaching and learning process. The paper recommends that government should spend less on hardware, more on human infrastructure and use surveys and assessment to guide continuous planning.*

**Key Words:** Information and Communication Technology (ICT), Human Capacity Transformation and Teacher Education.

Teacher Education is a type of training or Education given to would be teachers to impact knowledge in a classroom (Onwumere, 2006). Okebukola (1997) refers to teacher Education as the structure, institutions and processes which men and women are prepared to teach in schools for the purpose of imparting knowledge, favourable attitudes and effective skills.

In the educational system, teacher education is a vital component because it is concerned with the training of would be teachers to acquired requisite skills that will equip them in the task of teaching. This educational process embeds in its recipient pedagogical skills for the purpose of equipping them to educate/train learner's at specific levels of Education in Nigeria (Anikweze, 2008).

Denga (2001) opined that teacher education is a formal, systematic and organized training programme for the preparation of and development of required manpower of (individuals) with the necessary knowledge and skills that will enable them to effectively direct teaching/learning situations, implement the planned and developed curriculum of schools in the society. From the forgoing one can deduct eclectically the essence of teacher education to include:

- Giving professional training to teachers by impacting knowledge, skills, attitudes, aptitudes and values desirable in the teaching profession.
- The knowledge acquired will enable teachers transmit culture from generation to generation thus shaping the destinies of both the individual and the society for rapid development and progress. It is in recognition of the relevance of teacher Education programme that The Federal Government of Nigeria in its national Policy on education highlighted the goals of teacher education to include:
  - (a) Produce highly motivated conscientious and efficient classroom teachers for all levels of our educational system.
  - (b) Encourage further the spirit of enquiry and creativity in teachers.
  - (c) Help teachers to fit into social life of the community and the society at large and enhance their commitment to national goals.
  - (d) Provide teachers with the intellectual and professional background adequate further assignment and make them adaptable to changing situations.
  - (e) Enhance teachers' commitment to the teaching profession. (National Policy on Education, 2004) P. 33

The aforementioned objective presupposes the role of teachers in achieving educational objectives. This clearly indicates that the teacher is a catalyst that translates planned policies and programmes into learning outcome. The teacher is the human point of contact in education that brings life into the curriculum by inspiring students toward self-directed learning (Ezugwu, 2006).

To ensure quality in the teacher Education programme, the National policy on education (2004) page 33-35 stated that all teachers in educational institution shall be professionally trained and that teacher education programme shall be structured to equip teachers for effective performance of their duties. The policy further stated that teachers shall continue to be regularly exposed to innovations in their profession (NPE 2004). One of such innovations in the curriculum is the Information and Communication Technology (ICT) for which teacher education need to adapt to meet the changing circumstances of the time.

### **The Concept of Human Capacity Transformation**

The term is variously defined depending on the perspective authors want to use it. The United Nation Development Programme (1991) as cited in Okeke (2007) sees the concept “Human Capacity Transformation in a broader sense to include: A creation of an enabling environment with appropriate policy and legal framework which engender institutional development, community participation, human resource development and straightening management system. It further sees capacity transformation as a long term, continuing process in which all stakeholders participate (local authorities, ministries, nongovernmental organizations, producers, professional association academics and others).

Capacity building simply means giving the individuals or groups the requisite generic skills that will enable them perform tasks efficiently (Sani and Ibrahim, 2012). In other words, capacity building enable the individual to become more creative for wealth creation and thus sees opportunities where non seems to exist. Therefore we need to educate the would be teachers with technologies available in this fast changing world for efficient service delivery through information and communication technology (ICT). This is what Okeke (2007) was alluding when he asserted that capacity transformation is a deliberate process of developing and strengthening the skills, instincts, abilities, process and resources that organizations and communities need to survive, adapt and thrive in this fast changing world.

In general terms, capacity transformation is required in every aspect of work which required improvement-Governance, leadership, administration partnership and collaboration, Education, Marketing, Banking, Planning etc. In teacher Education capacity building which focus on innovative technique of teaching enable the teachers to guide pupils/students to perceive learning as an interesting and pleasant activity that promote the development of self understanding, inquiry and critical thinking ability.

### **Human Capacity Transformation through Information and Communication Technology (ICT) in Teacher Education**

The concept and ideas of Information and Communication Technology has become a recurrent issue in academic circle. Information Technology is used to acquire, store, organize and access data to a form which can be used in specified applications and disseminate the processed data (Rajaraman, 2006).

Adebayo (2007) defined information and communication technology as “the technology of creating, processing, storage, retrieval and transmission of data and information including telecommunications, satellite technologies, electrical and electronic (hardware), electronic computing (Software), the internet and Global systems of mobile communication (GSM)”. It is the use of electronic process for storing information through electronic devices and making such information available to the users whenever it is required.

Rahman (2002) asserts that Information and Communication Technology is the effective use of equipment and programme to access, retrieve, convert, store, organize, manipulate and present data and information. It is a whole range of facilities that involved information processing and electronic communication to be handled with skills and expertise for effective achievement and realization of its potentials in both education and social development (Obi, 2010). Galadanchi (2005) as cited in Dantani et al (2012) posited that today we have at our disposal, a marriage between computer and CD ROMS , radio, television, satellite, fixed and mobile telephone, fax and internet which are collectively referred to as Information and Communication Technology. Thus, while information technology has the capability to give out data, information and communication technology on the other hand has the capacity for both giving out and receiving input, which makes the later a better tool in the educational process.

The National Commission for Colleges of Education (NCCE) a regulatory body of Teacher Education in Nigeria in its 4th Minimum Standard 2009 Pg 23- made computer literacy a compulsory course for all students in Colleges of Education in the country for a technological breakthrough. This is made possible because a teacher that had been trained using ICT compliance can take advantage of the dynamism of ICT to demonstrate some difficult concepts, theories and principles in their fields of specializations. This will give meaning to the classroom instructions and thus enhance his teaching and make his class presentation exciting. Hence, making his taught to become independent learners, capable of developing critical thinking and problem solving strategies, involve in collaborative work and inquiry. Assist them in information searching, computer modeling, teamwork, brain storming and revision and access to a variety of learning tools expert opinion and alternative view point.

### **The Relevance of Information and Communication Technology in the Transformation of Human Capacity in Teacher Education**

UNESCO (2001) stated that ICT and properly developed multimedia materials can enhance the initial preparation of teachers by providing them with good training materials, facilitating simulations, capturing and analyzing practice teaching, bringing into the training institution, world experience, familiarizing trainees with sources of materials and support, and training potential teachers in the use of technologies for teaching and learning.

ICTs provide lifelong upgrading and professional development to teachers by providing course through distance, asynchronous learning and training on demand and it has the advantage of ease of revisions and introduction of new courses in response to emerging demands. It help to motivate teachers and would be teachers by breaking the professional isolation from which many suffer thereby connect them with colleagues, mentors, with universities and centre of expertise and with sources of teaching materials.

This connection will enable teachers:

1. To interact with students over a physical distance.
2. Enable simulation, role-playing and decision making exercises.
3. Link with virtual communities facilities and share information, ideas, and experiences as well as collaborate on projects, exchange materials and communicate with colleagues and students.
4. Link their experiences directly with instruction going on in their own classrooms; after online training session they can apply the new techniques or use the new materials immediately in their classes.
5. In remote locations to access online libraries and current research which can significantly enhance learning and individual initiatives. Carefully designed computer-mediated professional development can dramatically reduce the cost of teacher training.

The utilization of Information and Communication Technology (ICT) for teacher training has its attendant consequences. There is an argument that the role of the teacher has changed and will continue to change from being an instructor to becoming a constructor, facilitator, Coach and Creator of learning environments. The new educational technologies do not curb the need for teachers but for the redefinition of the teaching profession because ICT will cause certain teaching resources to become obsolete. Localized resources such as overhead transparency and chalkboard may no longer be necessary if all learners has access to the same network resource on which the teacher is presenting information, particularly if the students are not at the same place physically; and will make some assessment methods redundant. For example online tests provide the teacher with more information than traditional multi-choice tests.

The utilization of Information and Communication Technology in Teacher Education implied that it is no longer sufficient for teachers to impart content knowledge but they should encourage higher levels of cognitive skills, promote information literacy, nurture collaborative working practices and teachers are also require to be:

- Facilitators helping learners to make judgments about the quality and validity of new sources of knowledge.
- Active cooperators and collaborators
- Open-minded and critical independent professionals.
- Mediators between learners and what they need to know
- Providers to scaffold understanding

### **Competences Required for Effective Integration of ICT into Teacher Education**

The Requisite Generic skills required by teachers' educators to impart ICT skills apart from the provision of "the necessary things of Education" that will create enabling environment for the integration of ICT to thrive in Teacher education include among others; creativity, flexibility, logistic skills for assigning work, study places and grouping students, skills for project work, organizational, administrative and

collaborating skills, when the ICT skills are imparted to would be teachers or teachers, they will in turn become technically competent to be able to:

1. Operate computers and use basic software for word processing, spreadsheets, emails and search engines.
2. Evaluate and use computers and other related ICT tools for instruction.
3. Create effective computer based presentations.
4. Search the internet for resources.
5. Integrate ICT tools into students learning activities across the curriculum.
6. Create multimedia documents to support instruction.
7. Create hypertext documents to support instruction.
8. Keep updated with current educational technology.
9. Apply current instructional principles, research and appropriate assessment practices to the use of ICTS.

For the teachers to assume these new roles, they are expected to upgrade their knowledge and acquire new skills:

**Pedagogy:** Teachers need new teaching skills to be able to take advantage of the potential of ICT to enhance students learning. The use of questioning strategies is an essential component of developing an inquiry based classroom where a structured discussion raises issues and probes beneath the surface of issues to engender logically processed thought.

**Curriculum Development:** There is need to coach teachers on how to develop appropriate, effective curriculum that will enable students to construct meaning, develop new knowledge and communicate understanding; developed strategies to meaningfully integrate technology into the curriculum as a learning tool and not merely treating it as a subject area itself. To use this technology, teachers required long-term skills and strategies in order to engender positive student's outcome and achievement of learning goals. Sani etal (2012) posited that for this integration of technology to the curriculum to be made possible, teachers need a system of support at various levels to be able to overcome their isolation as they grapple with new and unfamiliar approaches to teaching and tools for learning. Real time support in resolving problems related to hardware, software, and computer networks; are also required for the integration of technology into curriculum and its implementation.

### **Strategies and Modalities for Human Capacity Transformation in Teacher Education**

Information and Communication Technology (ICTs) are diverse set of tools and resources used to communicate, create, disseminate, store and manage information. These technologies include computers, the internet, broadcasting technologies (radio and television), and telephony. There is increasing interest in how computers and the

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internet can improve education at all levels, in both formal and non formal settings. Several studies have indicated the benefits of ICTS in education. Meta analyses have found consistently positive and moderately high capacity gains at all educational levels from computer mediation in the transformation of human capacity. Computer assisted instruction was found more effective in all educational levels with lower achieving students (Kulick, 1983). ICTS improve problem solving skills, provides opportunities for increase collaboration, mastery of vocational and workforce skills and preparation for most careers, vocation, improve confidence and attitudes of students for future career as a teacher.

In view of the above mentioned relevance of ICT in Human capacity transformation in teacher education research have shown that various modalities for professional teacher development are available but various sources use different typologies for classifying this modalities. However, six professional development models constituted different modalities for human capacity transformation in teacher education.

1. A stand alone course devoted entirely to the instruction on the use of Technology in education.
2. A College/University requirement for graduation. A set of technology skills that an institution expect all student to demonstrate in order to graduate and it emphasizes basic technology literacy.
3. An integrated technology instruction courses embedded at all levels of the educational programme. The first level informs and provides a basis for subsequent levels till graduation.
4. Requirement for field experience in technological skill: In the form of industrial attachment to enable pre-service teachers use technology to enhance their ability in changing teaching and learning when they are in the classroom.
5. Experiences with computer-assisted instruction and distance education as a technology component can provide students with exposure to technology, model appropriate uses of technology for instructional purposes, and provide students with the opportunity to practice and reframe their use of technology. Though these tools may not be useful on their own in enhancing students knowledge of the use of technology, they can be part of a successful technology integration approach.
6. Full integration of technology into the teacher education programme. This approach differs from the integrated technology component because instructional technology is embedded in all courses of teacher education majors including general education, content area, methods etc. experiences in teacher development using ICT as a tool has generated a number of valuable insights which have led United Nation Education, Scientific, and Cultural Organization (2009) to advice that teacher development through training using ICTs can be significantly enhanced and made more effective by taking into consideration these basic factors.

1. Introduce applications that provide clear benefits for pupils and teachers and not simply on how to use the technology for this will create interest to learn.
2. Encourage a broad awareness of a wide range of ICT, resources with less emphasis on word processing and more on resources which are currently underused such as the internet, e-mail and video-conferencing.
3. Introduce the idea of ICT as tools for lifelong learning for teachers as well as their students.
4. Promote information literacy as well as ICT literacy by focusing on the content of ICT and not only the technology itself. By doing this, teachers will become more aware of the value and benefits of ICT to themselves and their pupils.
5. Allow teachers to work with a range of computers and operating systems; though some authorities are moving toward a more coordinated approach in terms of hardware, teachers still need to be able to transfer their skills between different types of computer.
6. Encourage teachers to reflect on and make decision about their own ICT development needs on an ongoing basis. This will ensure more involvement and ownership and greater integration of ICT into teaching and learning process.
7. Training and development opportunities should be flexible; to enable teachers make choice and guidance where appropriate at different stages of ICT literacy, curricula and or different stages in their own career progression.

Information and Communication Technologies (ICTs) have impacted significantly on teaching learning research and school management in a number of ways. They are electronic technologies used for accessing processing, gathering manipulating and presenting or communicating information. It encompasses software, hardware and even in connectivity (Anderson and Baskin, 2002). When ICTs are employed into Human capacity transformation in education given the right condition, the accelerate, enrich and deepen skills which helps to relate academics to the practices of today's work. In the teaching learning context, ICT serves to remove the physical boundaries that restrict learning to any specific location and permits the teacher to avail himself of new information source, thus enhancing his knowledge; and any teacher education programme that does not incorporate ICT pedagogy into its curriculum content for the training of teachers is not responding to the global needs of today's teacher.

### **Recommendations**

To be able to meet the reality, demands of teachers in today's globalized world, using ICT as tool, teacher education in Nigeria need to among others.

- (1) Be provided with adequate funding for sustained, well designed adult learning programmes which incorporate Information and Communication Technologies (ICTs).
- (2) Take teachers seriously and adapt to their needs. When their desires and choices are sort for and they have options which match their preferences; this choice become the cardinal design concept behind their learning.



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- (3) Train teachers on how to make up their own minds on practical issues and independent thinking which require remarkable skills as questioning, navigation, information literacy (inference, analysis, synthesis and interpretation) instead of computer application without classroom utilization.
- (4) Give a good percentage of the time available to foster reflection on the steps which will make the new tools, resources and strategies a feature in the classroom.
- (5) Create peer coaching and mutual support among technology specialist. This will encourage specialist to teach in their field of specialization so that one specialist in spreadsheets, one in search engines, while another is in multimedia presentation etc, cooperatively they share, distribute and empower the teachers broadly.
- (6) Provide time for invention and lesson development. Invention allow teacher to translate new possibilities into familiar terms and real contexts. They may customize the lessons to create a match with the needs, the preferences and the capabilities of the young learners they serve.

**Conclusion**

The introduction of policy initiatives to encourage the use of Information and Commutation Technologies in Nigerian schools since 1985 have not yielded the needed results of improving teaching and learning. The changes noted in human capacity transformation in Teacher Education through ICTs are much more smaller than expected, inspite the fact that potential for real change are great. ICTs are to facilitate teachers teaching and enhance students' learning. It has the great potential in transforming human capacity for improvement in classroom instructions. With teachers having the needed skills and knowledge, provision of needed infrastructure, ICTs will be of benefit to Nigerian Schools. These potentials can only be exploited when necessary initiatives, some of which are noted in this paper are taken. The initiatives suggested though not exhaustive can serve as springboard for ICTs integration in teacher education in Nigeria.

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