
Information and Communication Technology in Curriculum Implementation: A Panacea for the Production of Effective and Efficient Manpower Need in Nigeria

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Abstract

The focus of this paper is to highlight the immeasurable impact of information and communication technology in the implementation of the national curriculum for the production of effective and efficient manpower need for national growth and development. The concepts of curriculum implementation and information and communication technology were thoroughly explained. Numerous roles of ICT in curriculum implementation were highlighted and they include–storage, dissemination, analyzing, stimulating, interaction, communication, wide audience coverage, overcoming physical limitation, productivity, individualizing instruction to mention a few. The paper also highlighted some careers requiring ICT service such as teaching itself, banking and finance, health care delivery management and administration etc. some problems such as poor infrastructure, poor funding, limited access to internet, inadequate skill manpower and poor planning were also touched. The paper concluded by advancing some recommendations to enhance effective use of ICT services toward the production of good manpower need for national growth and development; these include; provision and sustenance of good infrastructure, issuing of license to more internet service, provision of many computers to schools, in-service training, ICT a pre-requisite for job use on cyber café among others.

Introduction

Knowledge according to the progressives, is dynamic and not static hence planned and implemented curriculum should be dynamic to be abreast with the demand of the ever changing societal needs, values and aspiration. Education (an instrument for training and development) is a dynamic venture thus changes with time and place to

truly produce well seasoned and functional citizens to meet up with the challenges of time. As a vehicle and a powerful tool for social, economic, political and technological development, education must therefore be overhauled on a continuous bases to give a true reflection of the modern and current trend of technological advancement hence Information and Communication Technology (ICT) as an innovation in teaching and learning must be embraced by all at all levels of education in curriculum implementation for the production of effective and efficient manpower need in Nigeria.

The aim of education being to acquaint and develop the child's intellectual, physical and emotional abilities, Orukoka et al (2009), stated that "the school curriculum is the means which any nation uses to achieve these educational objectives and it is through such means that doctors, accountants, lawyers, engineers, nurses, teachers and others are prepared by the teacher for the nation. Esu (1995), also asserted that the country uses its school curriculum content to produce various kinds of manpower needs in all field of endeavour". ICT has altered the way people think and do their jobs and thus must be entrenched fully with all seriousness and commitment into Nigerian educational system at all levels for a greater tomorrow.

The Concept of Curriculum Implementation

Curriculum implementation is a very important aspect or phase in the curriculum process. The planned curriculum in the form of written document is an embodiment of assumptions and suggestions to guide the actions of the teachers and students and if not implemented or actually utilized in teaching and learning process, will have its laudable goals and objectives defeated.

Curriculum implementation is the practical or action oriented phase of the curriculum process. It is the trying out stage of the identified objectives, content, learning experiences and materials selected at the planning stage. According to Mkpa (1987) "Curriculum implementation is the execution of the curriculum document". He further describes it as the task of translating the curriculum document into the operating curriculum by the combined efforts of the students, teachers and others concerned. Bobalola (2004) on his own part, sees curriculum implementation to be, "the multifarious activities of translating a complex curriculum conception in the form of a design or plan into new patterns of practical action useable and realizable in a teaching and learning milieu".

Curriculum implementation is the stage when in the midst of learning activities, teachers and learners are involved in negotiations aimed at promoting learning with the teachers adopting appropriate teaching method and materials to guide students learning. (Offorma 1994). Since this involves the actual engagement of students being actively involved in the process of interaction with learning activities that bring about meaningful learning, serious care should be taken in addition to effective utilization of current teaching materials to make for effectiveness and efficiency in the teaching /learning process.

Concept of Information and Communication Technology (ICT).

Generally speaking, information can be regarded as skills, attitude, beliefs, values and knowledge of facts or details about persons event or situations. Information is often times seen as processed data presented in a suitable form for human interpretation and usage in relation to knowledge, instruction, communication, representation and mental stimulus (Ureme 2008). Ibrahim (2003) also sees information as involving “knowledge acquired in a manner, ideas and facts that have been communicated or data that can be stored and retrieved in machine readable”.

Communication according to Okwo (1995), is “an interactive process involving the design of ideas, messages, information or data and their dissemination in an attempt to effect change in a person’s behaviour or to persuade him to act in a particular predetermined manner” Ogunranti et al (1981) asserted that communication process is another type of learning process where an individual attempts to convince, persuade or change another individual’s behaviour. Based on these, feedback is usually expected when a message or information is passed on. It is the feedback that makes one know if the message or information passed on is effective or not. (Ughamadu 1998). Classroom interaction involves communication between two or more persons or equipment aimed at given and receiving information toward achieving pre stated educational objectives.

Technology can be regarded as a systematic and creative application of knowledge with the use of new machines, equipment, principles and ways of doing things based on modern knowledge of science and computer to solve human problems. The creative and systematic application of science or organized body of knowledge to educational problem or purposes can also be regarded as educational technology. Okoye (2004) asserted that Technology of education relates to the theories, approaches and methods of instructional delivery which facilitate learning and makes the art of teaching a worth while venture for teacher and learner.

Looking at the meaning of Information and Communication Technology (ICT) therefore, Ijioma (2004), defined ICT as “technology that acquires, processes, stores, retrieves at will, disseminates, vocal, pictorial, textural and numerical information by combining data processing and telecommunication techniques”. Aneke (2005) Says ICT as the concept of acquisition, handling, processing and distribution of information is using hardware and software telecommunication and digital technologies. With Eze (2007), seeing ICT to be “the various ways the computer works, together with other telecommunication equipments which are needed in data processing and information transmission to solve problems of different aspects of human endeavour”, the writer ICT therefore, state that ICT is greatly needed in curriculum implementation as it offers the teacher a new role –designing situation for learners to manipulate information towards solving realistic problems emanating from various human endeavour.

Roles of ICT in Curriculum Implementation

The importance of Information and Communication Technology (ICT) cannot be over emphasized in effecting the desired national development in Nigeria, in the words of Ajileye (2008), “ICT has turned the whole universe into a global village” Also Arthur (2002) stated that, “ICT is the propelling force driving global competition, awareness, communication and interaction at the speed which has never been imagined

before'. Utilization of ICT as a means of developing all sectors nationally and all areas of human endeavour such as agriculture, education, security, economy, communication, health; trade etc. (Akinola 2008).

Teachers'-Angle

The teacher being the major implementer of the curriculum, occupies a central position in curriculum implementation with the job of setting up learning opportunities and using appropriate method and media to bring learners in a face to face encounter with learning activities aimed at enabling them acquire the desired knowledge, skills and values. The teacher thus can, make effective and successful use of ICT for effective classroom interaction in the following ways.

- 1) Store his lesson in the computer for classroom usage.
- 2) Disseminate vocal, pictorial, textural and numerical information by combining data processing and telecommunication techniques.
- 3) Utilize other already stored relevant information to enrich learners' knowledge and skills.
- 4) Stimulate and awaken students' interest thus making them alert, attentive and arousing their curiosity to learn and know more as the use of introductory film strip presentation, television or cassette tape programmes will no doubt provide the teacher with interest –compelling spring- boards that launch students into a wide variety of learning activities. (Ughamadu, 1998).
- 5) Take good care of wide audience or large number of learners been educated/taught in less time with media like radio, television, and even closed circuit television service as being used now at Obafemi Awolowo University Ile-Ife to teach extra-large classes in General Studies (GS).
- 6) Overcome physical limitations in classroom environment in the presentation of subject matter to students through the use of media such as transparencies and overhead projectors, slide/projectors, videotape/recorders/television and others. (Ughamadu, 1998).

Learners'-Angle

Since it is through the learners own activities that meaningful learning takes place, learners as another major factor in curriculum implementation can make effective use of ICT facilities performing instructional delivery role with or without supervision in the following ways:

- 1) The use of Computer Based Education (CBE) which exposes the learner to a variety of instructional options through multi-channel learning which includes, radio, video, and computer –based media in a variety of instructional techniques like workshops, symposia panel discussions, role –playing, stimulation and games (Adiele 2005). This no doubt facilitates curriculum implementation through individualize and collaborative instruction where

learners can learn and proceed at their own pace and time using programmed
Information and Communication Technology in Curriculum Implementation: A Panacea for the
Production of Effective and Efficient Manpower Need in Nigeria-- Obiajuru Evarista Efed
and Clara D. Moemeke, (Ph.D)

instructions, teacher machine, electronic learning laboratory and computer to manage and generate instructional research and administration data.

- 2) The Use of internet via electronic cash, internet telephones, high speed internet, access internet appliances and others as instructional tools, offers the learners good opportunity to explore, investigate, solve problems interact, reflect, reason, communicate thus exchange ideas with others out side the classroom and learn many concepts in the curriculum. Indeed, ICT equipment provide immeasurable and meaningful sources of information to learners.
- 3) Though ICT also, the learner can acquire the basic language skills of listening, speaking, reading and writing thus enhancing their fast understanding of curriculum content at all levels. Udensi (2006) asserted that, “the teaching and learning of writing (essay) can now be better enhanced by using computer programmes that correct errors and provide feedback.
- 4) ICT in curriculum implementation plays no mean role in facilitating the education of the disabled; as noted by Oluwole (2007) that, ICT tools could be used to teach and facilitate learning capabilities of both able and disabled learners.
- 5) ICT can assist learners in effective curriculum implementation through virtual reality and virtual library. Adiele (2005), sees virtual reality as a three dimensional computer simulation in which the learner actively and physically participates in an activity as if he/she is there thus placing the learner in any experience he/she desires and sends physical responses back to him/her. Also with the aid of ICT facilities, learners can easily get relevant information for learning through conventional library and virtual library providing them access to current textbooks, newspapers magazines, journals and others both national and international for effective curriculum implementation.
- 6) The use of ICT no doubt makes learning more concrete, real, immediate, faster and permanent thus more productive as it facilitates the rate at which students learn and understand whatever subject matter presented. Media create impression that are so vivid and powerful; giving students experience that they cannot forget so easily. Supporting this point, Udensi (2006) stated as follows: “In fact, our ways of life have been greatly touched and influenced, ICT equipment have brought about speedy, timely – and efficient information processing which is very significant to people”.
- 7) ICT facilities provide learners avenues or opportunities for so many other things to enhance curriculum implementation viz:
 - (1) Ask question, predict and make hypothesis.
 - (2) Observe, measure, record and manipulate variables
 - (3) Interpret their results and evaluate scientific evidence
 - (4) Present and communicate their findings in a variety of ways.Questioning for instance, through which learners become inquisitive and curious to know more about things is essential for active and meaningful learning as it enhances good understanding of subject matters presented.
- 8) Evaluation or assessment of learners’ performance which is an integral part of curriculum implementation is made very easy for both teachers and

administrators through the provision of immediate feedback which enables the learners to ascertain their areas of strength and weakness. Even in microteaching where the trainees' teaching exercise for the development and acquisition of skill are video-taped and replayed for analysis/critique, ICT devices offer the trainee teacher the opportunity of self analysis of his/her performance.

- 9) The importance of ICT facilities in the execution of distance learning programme in Nigeria cannot be overemphasized.

ICT and Manpower Need

From the above stated over whelming impart of ICT in curriculum implementation both on the part of teachers and learners and seeing ICT as a process of networking – connecting any part of the world by mere touching a combination of keyboard buttons on electronic device like radio, television, telephone, computer etc. an innovation indeed in our ever changing society, there is a great need that all and sundry must avail themselves the opportunity. ICT training must then be inculcated into the Nigerian education system to bring people to the reality of the universal phenomenon as to produce effective and efficient manpower need for national development.

Acknowledging this prominent role of ICT in the advancement of knowledge and skills for effective functioning in the modern world, Kolade and Seweje (2006), called for urgent integration of ICT into education in Nigerian schools at all level with great focus on students and teachers toward producing good manpower to bring about the needed and sustainable development in Nigeria. Ogunlaye (2006), recognized the rapid change in the world engendered by the use of ICT in the way we conceive, see, work, think, learn socialize and conduct business, education thus should change and follow the modern trend to enhance the ability of learners far above the use of micro-computers to the wholesome integration of modern telecommunication especially the internet in the production of manpower need for solutions to societal and other complex problems.

The over whelming adoption of ICT in all facets of human endeavour poses great challenges to the production and development of manpower needs in Nigeria since new ability and competency is virtually needed in the modern trend of world globalization and technological advancement. Seeing competency as the knowledge, skills, attitude and judgment, which are required in order to perform successfully as a specified proficiency in any given work (Olaitan 2003), it is therefore pertinent to note here that ICT knowledge, capabilities, skills and behaviour needed in doing our job as to achieve meaningful results must be in effective operation in the execution of different jobs, career or fields of endeavour such as:

- 1) **ICT in Teaching and Learning:** As mentioned earlier, the teaching and learning is greatly enhanced by the teachers and learners' effective and efficient utilization of ICT facilities or devices both within the classroom and outside the classroom for meaningful implementation of the specified curriculum. It is an understatement saying that greater positive result is achieved in teaching and learning process with

and Clara D. Moemeke, (Ph.D)

the use of ICT in retrieving or collecting and storing of information or data, analyzing and disseminating the information or knowledge and skill practically or theoretically for the good of man. Even for effective execution of distance learning programme, ICT facilities are highly needed.

- 2) **ICT in Banking and Finance:** With the modern trend of banking system where virtually all banks have gone on-line for effective business transaction no new skilled job seeker that has no good knowledge of computer operation is ever employed. The old workers are even sent on intensive computer training on routine basis to acquire the needed job demanding ICT competency to be able to function effectively. Seminars and workshops are often times organized for these bank officials for continuous updating.
Apart from bank, other sectors or establishment have its finance section making full use of ICT devices in their day to day accounting job.
- 3) **ICT in Health Care Delivery:** From the manufacturing of drugs, its administration and assessment of its effectiveness, all are based on ICT for efficiency. The entire hospital management has virtually all its operations and dealings with patients, non-patients and staff based on the use of ICT facilities. In the various departments such as: x – ray, theatre, ultra sound, Radiology, medical laboratory, maternity, Intensive care units, pharmacy, optical unit and many others, performance and competency are facilitated and enhance through the use of ICT devices for effectiveness.
- 4) **ICT in Management and Administration:** For any success to be achieved in the management and administration of any nation, state, local government, establishments both government and private, companies, schools, churches, mosques to mention just a few, effective information and communication technology network must be put in place for a smooth flow of information, and good record keeping through the use of storing and retrieval devices.
- 5) **ICT in the Manufacturing of Goods:** The involvement of ICT in manufacturing industries, printing press and many others cannot be underestimated as the operation of the modern sophisticated equipment and machines no doubt requires, ICT based skilled manpower for effectiveness and efficiency.

Challenges of ICT Usage in Curriculum Implementation

It is good to note that the insurmountable, immeasurable and un-overemphasized importance of information and communication technology (ICT) in curriculum implementation toward the production of needed manpower for national growth and development is not without problems or drawbacks in their effective usage. These noted challenges or obstacles include; Poor infrastructure, cost/poor funding; inadequate skill manpower, limited access to internet, poor planning among others.

- 1) **Poor Infrastructure:** For ICT to thrive well there must be provision of good power supply either by private generator or NEPA now called power holding. It is unfortunate to note that Nigerian government has a serious problems in the provision of stable and reliable electric power supply to the nooks and cranny of the country. Since not everybody can afford the purchase and maintainance of private generator and the fluctuating voltage has damaged most ICT equipments,

the Nigerian government therefore must fashion out better ways of power supply to enhance ICT in Nigeria.

- 2) **Cost/Poor Funding:** A system that is not adequately funded cannot achieve good result. The funding of Educational sector in Nigeria has not be commensurate with the modern trend of knowledge explosion and technological advancement. With the cost of computer hard ware and software and their accessories rising, most schools especially the public schools cannot afford buying computers and their accessories. It is indeed a drawback of the essentials of ICT in curriculum implementation.
- 3) **Lack of Computer in Nigerian Schools:** Many schools indeed have no computer. Some with just one donated by a philanthropist is as good as having nothing since it is of no good use to the students. Lamenting on this, Tuoyo (2007) stressed that “inability to access computers means creating more social illiteracy and economic denial of the rights of children especially the exceptional children to participate in the school system and in the society at large”. This however makes difficult or virtually impossible the full implementation of curriculum using ICT.
- 4) **Limited Access to Internet:** Since most schools have no computer, how good then can we talk of teachers and students having access to internet when they have to knowledge of computer operation. Some private schools that may have computers may not be financially buoyant to afford the internet connecting fee charged by the few reliable providers of internet gate way service. This no doubt is a problems to effective usage of ICT facilities in curriculum implementation.
- 5) **Inadequate Skilled Manpower:** Aderogba (2009), noted that there is acute shortage of trained personnel in application software, operating system network administration as well as the technicians to service and repair computer facilities. There is inadequate supply of manpower for maintenance of ICT facilities everywhere and in Nigerian schools of which when the accessories breakdown, the system will be packed waiting for repair for a long time. Indeed, the needed manpower to maintain the system is very much in short supply.
- 6) The fear, ignorance and refusal of some teachers to embrace the new trend of technological advancement is a serious hindrance that must be attended to.
- 7) **Poor Planning:** Nigeria has a great problem of curriculum planning usually made mid-way into the implementation process. Most often they make the educational plans without proper foundational plan and feasibility study about the finance, legibility, adequacy and readiness of teachers, technicians, attendants and even the learners that will be involved in the interpretation and implementation of curriculum. Often times, teachers are not intimated of the changes in curriculum plan and even when they are sometimes aware, they may

Information and Communication Technology, Tools and Materials necessary for effective Production of Effective and Efficient Manpower in Nigeria. Obiajuru Evarista Efedu and Clara D. Moemeke, (Ph.D)

Conclusion/Recommendations

Having examined the place of ICT in curriculum implementation and its great impact in the production of effective and efficient manpower need in this modern trend of high technological advancement; the associating problems notwithstanding, it is pertinent to say that Nigeria cannot be left out in this world globalization race but to embrace it fully for national growth and development. Based on this, the following recommendations must be conscientiously treated with utmost importance to actually carry the society along the path of technological transformation.

- 1) Proper provision and sustenance of the needed infrastructural facilities must be made to enhance ICT operations. Government should pay adequate attention to electric power supply such as solar energy and procure good generator machines to schools as standby power source.
- 2) Government should encourage teachers and learners to use ICT in their teaching and learning process by procuring a good number of computers, its accessories and other educational technological devices like: Radio, video tape/recorders, televisions etc and even personal wireless computer to all students and teachers to enable them access and perform other academic activities on net. Teachers and students also, should endeavour to use public cyber café at their private time.
- 3) The federal, state and local government, even stockholders should pay adequate attention to the funding of education sector as it is an inevitable instrument for national growth and development. The beautiful and laudable influence of ICT on national development should not be jeopardized by poor funding. The government should be deeply committed to the course of making education a lucrative and an enviable industry to enhance national development.
- 4) License of operation should be issued to more internet services providers and also have them enlisted for work. Not just few monopolizing the situation to extort huge money from subscribers.
- 5) Curriculum experts should endeavour to go for computer literacy programme and be encouraged to change their working with paper and files to a more pragmatic ICT oriented method.
- 6) Textbooks specialists and teachers also must be encouraged to proceed for computer literacy programme as to acquire good computer operation skills for effectiveness and efficiency in their role-play.
- 7) ICT as a novel in Nigeria educational system, calls for careful preparation, management, resource and continuous support from all tiers of government and teachers for effective implementation.
- 8) Adequate computer laboratory, other infrastructure, up to-date software and hardware resources as Robust internet, band widths, overhead projectors to mention a few should be provided to teachers for effective teaching, learning and research.
- 9) ~~The use of power point for presentations during conferences, seminars and workshops should be encouraged and enforced.~~
- 10) As a matter of urgency, the new 9-year Basic Education curriculum, senior secondary school curriculum and teachers handbook in ICT should be adapted and implemented.

- 11) Current books on ICT should be made available in the school libraries for both teachers and students.
- 12) Good emphasis should be laid on more students taking to science courses and computer subjects rather than over flooding the Arts and Social Sciences. Students therefore should be encouraged in this direction.
- 13) In-service training seminars and workshops on ICT should be organized for Nigerian workers in different sectors on a regular basis to keep abreast with great demand of the current trend of technological advancement.
- 14) As a challenge to young job seekers and as a lasting measure for people to truly take ICT serious, government should make ICT knowledge a pre-requisite for job employment into any sector in Nigeria.

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