

# THE IMPACT OF INFORMATION TECHNOLOGY ON POLYTECHNIC/TECHNICAL EDUCATION IN NIGERIA

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## **Abstract**

The current edition of the National Policy Education (2004 edition) advised on the Introduction of Communication technology in the Schools system. IT, as a strategic part of the modern educational system enhances teaching and learning skills and makes it easy to provide audio-visual education, on-line library and distance-learning or correspondence study. Some of the applications of the Information Technology in teaching and learning include but not limited to the following: Computer-assisted Instruction, Teleconferencing, Internet, Management Information System and Modeling and Simulation. The study suggests that in order for Information Technology to succeed, like any other educational tool, it cannot exit in isolation, but must be made an integral part of the entire instructional process. It further suggest training and continuous retraining of teachers/lecturers for effective integration of the Information Technology into the school system. Finally, the study advocates a recipe for adequate financing of the IT system for effectiveness.

## **Introduction**

In order to keep pace with the dynamics of social change that the demands of Educational growth in the country, the policy makers deemed it necessary to make some policy innovations and changes in the 3<sup>rd</sup> edition (1998) of the National Policy on Education. These innovations gave birth to the 4<sup>th</sup> edition of the National Policy in Education which was published in 2004. One of the most beneficial of the policy innovations and changes include, but not limited to the following:

- (i) Introduction of information and communication Technology (ICT) to the school system and
- (ii) Repositioning science, technical and vocational education in the scheme of national education for optimum performance,

In order that tertiary education should have is concomitant impact in national development, it is pertinent that information communication technology (ICT) be developed to an appreciable level both in the school curricula and application to learning and teaching and in research and management. For example, some Polytechnics in south-south were established with the sole objective of making the products (graduates) self-reliant. In this context, they are expected to be employers of labour instead of being employment seeker. One of the veritable methods of producing such graduates is to inculcate ICT into the curricula and to ensure ICT compliance by both lecturers and students and in management application in the school system.

Some of the national educational goals which derived from the national policy education (2004) are that educational activities shall be centred on the learner for maximum self-development and self-fulfillment ..... and that modern educational techniques shall be increasingly used and improved at all levels of the education system (FRN, 2004:9).

In the above context, with the computerization of the teaching and learning processes, vis-a-vis, the use of e-learning e-management and intranet and internet system in information management, and the consequent development of the above facilities, the impact of the ICT in Polytechnic education would have been felt in earnest. From the foregoing, it can be seen that a lot of work still needs to be done: unfortunately, most of the lecturers in the tertiary education system especially Polytechnics are not ICT compliant. Also, except for some Polytechnics which were so fortunate to have their ICT laboratory built and computers and relevant accessories procured for them, higher institutions do not have the requisite fund to apply ICT in their systems.

### **Objectives of the Study**

- (i) To examine the present level of Polytechnic education system as-it-is and
- (ii) To observe the positive impact of introducing ICT into the Polytechnic/technical education in Nigeria.

### **Available Teaching Resources/Facilities and the need for Technology in Education.**

Information technology, while an important area of the study in its own right is having a major impact across all curriculum areas. Easy world wide communication provides instant access to a vast array of data, challenging assimilation and assessment skills. Rapid communication, plus increased access to IT in the home, at work, and in educational establishment, could mean that learning becomes a truly life long activity-an activity in the which the pace of technological changes forces constant evaluation of the learning process itself.

In relation to Polytechnic Education, the national (NBTE) and national Policy on education specified staff-student ratios as 1:40 and 1:35 respectively. Dawodu (2007) posited that: "There is hardly any technical institution or Polytechnic that has adhered religiously to this specification" (Dawodu, 2007:128)

In higher institutions in Nigeria, it is common sight to see more than 200/300 students against to lecturer, with more students standing outside the classroom to listen to lectures through the window. From the foregoing, it is easy to observe that the effectiveness of the teacher and learning process described above will be in doubt. Needless to continue to point out that the traditional chalkboard or mark and whiteboard is laborious for both teacher and students, it is instructive to also note that it is time-consuming and obsolete. The advantage of using information technology is that time-consuming work routines can increasingly be performed by means of this technology and time can thus be devoted instead to communicating and informing to the processing of information and the production of knowledge. Therefore, there is need to increase access and bring down the cost of education to meet the challenges of illiteracy and poverty-IT is the answer.

### **IT is a Strategic Part of Modern Educational System**

Bialo & Sivin-Kachala (1996) highlighted the need and importance of information Technology in promoting the effectiveness of teaching and learning in schools:

1. IT aids plenty of resources that enhance teaching and learning skills and makes it easy to provide audio-visual education. With vivid and vast technique as part of the IT curriculum, learners are encouraged to regard computers as tools to be used in all aspects of their studies.
2. IT has provided immediacy to education. Now in the age of computers and web networks the pace of imparting knowledge is very fast and one can be educated anywhere any time.

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3. IT enables anytime learning. One can study wherever he/she wills irrespective of whether it is day or night and place whether in Nigeria, U.S.A or Soviet Republic.
4. Through IT, collaborative learning has made it easy to study as well as teach in groups or in clusters. Efficient postal systems, the mobile phone, and various recording and play back systems based on computer technology all have a part to play in educational broadcasting in the new millennium.
5. The growth of audio-visual education has reflected development in both technology and learning theory. Among the devices used are still and motion pictures, filmstrips, television, transparencies, audio tapes, record's teaching machines, computers and video diss.
6. The information and data which are available on the net is purely correct and up to date. Internet, a collection of computer networks that operate to common standards and enable the computers and the programme they run to communicate directly provides true and correct information.
7. Internets support thousand of different kinds of operational and experimental services one of which is on-line library. As part of the IT curriculum; learners are encouraged to regard computers as tools to be used in all aspects of their studies. In particular they need to make use of the new multi-media technologies to communicate ideas, describe projects, and other information in their work.
8. Distance learning is a method of learning at a distance other than in a classroom. He term distance learning was coined within the context of a continuing communication revolution, largely replacing a hitherto confusing mixed nomenclature-home study, independent study, external study, and most common, though restricted in pedagogic means, correspondence study. The powerful incentive of distance learning has been reduction in costs per student, savings on travel time and other costs.
9. Information technology has brought drastic changes in the life of disabled children. IT provides various software and technique to educate these poor people.

#### **Application of Information Technology to Teaching and Learning**

The integration of information technology in teaching is central to ensuring quality in the educational system. There are two equally important reasons for integrating information technology in teaching:- Students must become familiar with the use of information technology, since all jobs in the society of the future will be dependent on it, and IT must be used in teaching in order to improve its quality and make it more effective.

##### **(i) Computer-Assisted Instruction (CAI)**

One of the most pertinent facilities that can be applied to improve teaching in tertiary institution is computer assisted instruction. They allow the students to learn interactively and work on class projects. The CAI makes students to learn more and rapidly. This has been shown to the

case across all subject areas, from preliminary studies to higher education. It allows students to have more control over their own learning, to think analytically, and critically, and to work collaboratively. This “constructivist” approach is one effort at educational reform, made easier by IT, and perhaps driven by it.

- (ii) **Teleconferencing:** Osazuw (2002) explained teleconferencing as that “which enables a group of people to meet electronically, thereby conserving the time and expense of physically converging at a spot” (Osazuwa, 2002: 406) There are three types of teleconferencing technologies:- audio-teleconferencing, video teleconferencing and computer-teleconferencing. Audio teleconferencing makes it possible for a conference to take place amongst several people on a phone system. It is also popularly known as “conference phone calls.” Video teleconferencing system allows participants to see and hear each other on video screens. Computer teleconferencing in its own case allows conference to take place via electronic mail boxes, even though all the participants may not be using the computer systems at the same time. In this system, users may broadcast messages to other participants at any time or retrieve all or any part of the proceedings of the conference.
- (iii) **Internet:** The internet and advanced net working technologies are comparative newcomer to the classroom. Although a large body of research on the effects of the internet in the classroom does not yet exist, recent studies illustrate some observed positive effects. A study by the centre for Applied special Technology (1996) shows significantly higher scores on measure of information management, communication and presentation of ideas for experimental groups with no access. Also, students in the experimental group reported significantly increased use of computers in four different area: gathering information organizing and representing information, doing multimedia project, and obtaining help in application of IT skills to learning.
- (iv) **Management Information System (MIS):** Teachers and administrators use computer and information technologies to improve their roles in the educational process e.g.
  - Using computer tools to streamline records keeping and administrative tasks, thereby helping to free-up-time for instruction or professional development.
  - Decreasing isolation by using e-mail and the internet to communicate with colleagues, parents and the outside world and
  - Increasing professional development activities by taking distance education courses, accessing educational research, and accessing materials to be used for lectures.
- (v) **Modelling and Simulation:** Teaching and learning in tertiary institutions, especially Polytechnics can be enhanced through the use of computer software and hardware. Computer Aided-design (CAD) and Computer Aided Management (CAM) have become useful tools in engineering drawing and designs and in management information systems in tertiary institution. However, their use and application need to be enhanced and improved upon.

### **Effective Use of Technology as a Powerful Instructional Tool**

One of the necessary characteristics of the effective use of technology is that it could be used for authentic tasks. The following are important considerations for fostering the authentic uses of technology:

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- The IT supports student performance of complex tasks that are similar to those performed by adult professional and/or fill a genuine need of the student.
- The IT is integrated into activities that are core part of the classroom curriculum.
- IT is treated as a tool to help accomplish complex tasks (rather than as a subject of study for its own sake) that engage students in extended and cooperative learning experiences that involve multiple disciplines.

IT has been known to accommodate learning styles and to be an effective motivator for students with specific learning needs. Furthermore, students working in collaborative-term-learning settings appear to function better when learning events are accompanied by technology use. In addition, technology also is important when it is used to provide distance-learning opportunities to students who otherwise would not have had access to course offerings. Examples of these are:

- Obafemi Awolowo University, centre for Distance learning (CDL) HYPERLINK <http://www.Cdloa.Online.com>
- [www.cdloa.online.com](http://www.cdloa.online.com).
- Mathematis Arahives:k12 Internet sites [http. // archives. Math. Uk Ed/K12.html](http://archives.Math.UkEd/K12.html).

Distance education is especially important to students in rural settings because of the inadequacy in the number of tertiary institutions available and their accessibility. Also of paramount importance is that is that education is made available to a large chunk of the society, especially the working class group.

However, in contrast to the statement made above, at least in developing countries such as ors (Nigeria), Internet access is restricted to those above poverty level. In this context, students who could hardly pay their school fees, can at best visit cybercafé irregularly and as such cannot be internet friendly to the extent of using it effectively for learning needs. Frtherto, most lecturers in tertiary institutions especially Polytechnics are not to even talk of being internet friendly. A reasonable inference here is that classroom computers and other technology can play many instructional roles, from personal tutor and information sources to data organizer adn communication tool. So, it is important for teachers to consider how computers and other electronic technologies can enhance the learning experiences of students and increase their productivity. The primary conclusion of much of the above consideration is that IT has considerable potential for increasing interest in, and improving the quality of learning of subjects of interest in classroom. However, effective use of instructional technology is possible only if sufficient attention is given to the following:

- Curriculum uses.
- Instructional pedagogy used.
- Assessments used.
- Sufficiency of technology and access to the Internet.
- Ability of the teacher, especially, to model uses of technology.

#### **Factors that Help Technology to Succeed**

Having considered some of the effective uses and benefits associated with educational technology above, but what are the factors that help technology succeed in bringing about the effectiveness?

Glenna & Melmed (1996) and the Technology counts analysed suggest the following factors observed in successful technology-rich schools:

- **Evidence of a Detailed Technology Plan:** Such a plan should consider funding, installation and integration of equipment, and on-going management of the technology. The plan should also express a clear vision of the goals of the technology.
- **Teacher Training and Continuing Education:** Teachers or lecturers should know how to operate the technology and how to integrate it into the curriculum. Administrative support can come in the form of funding, or in restructuring environment.
- **Support from the Community:** Parents, business, corporate organizations and community members can use technology as spring board to become more involved in the activities of neighbouring Schools/Polytechnics. Their involvement can come in form of donations of computers/accessories, air conditioners, or any other form of technical support.
- **Support from Government:** This can come in form of adequate funding and appropriate policy to assure that technology is accessible to all schools/tertiary institutions on equal basis.
- **Financial Prudence from Management:** This is to ensure and advise that funds meant for technology development and maintenance are not diverted to other uses. This is because; doing this may cripple technology instead of helping it to succeed. These factors suggest that to succeed, technology, like any other educational tool, cannot exist in isolation, but must be made an integral part of the entire instructional process.

### **Conclusion**

From issues considered so far it is immediately obvious that in the twentieth century, the importance of technology to tertiary institutions especially Polytechnics and Technical colleges cannot be overemphasized. In this era of globalisation, the rate of information flow and educational growth has become phenomenal. It therefore follows that the rate in which information and knowledge become obsolete is very fast. The fact that students whose curriculum and pedagogy run through ICT are likely to have enhanced skills makes the application of technology to technical education pertinent. Besides, while technology encourages collaborative learning in students, it nonetheless enhances teaching skills in the lecturers. Finally, when one considers the distance-learning advantages, the use of e-library, the modelling and simulation and the various components of computer-assisted Instructions, the storing and the retrieving of various records, we can safely concluded that the application of technology to tertiary education would provide the much needed impact. Also, ICT provides rapid communication, any where and in educational establishments, and this means that learning becomes a truly life long activity-an activity in which the pace of technological change forces constant evaluation of the learning process itself.

### **Recommendations**

- i. Government, communities and individual institutions should develop strategic plans for information technology installation development. This should ensure the right application of information technology in both academic and administrative settings in Polytechnics/technical institutions.
- ii. Local-Area Network (LAN) and wide-area Network (WAN) facilities should be developed so as to enable Polytechnics/technical colleges establish and develop their own ICT and link them to functional networks within and outside their institutions.

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- iii. There should be adequate provision of enough computers for computer-assisted instruction (CAI) and teleconferencing. There should be adequate financial support in terms of infrastructures e.g air conditioners required to maintain the computers at ambient temperatures.
- iv. There should be provision for functional training for teachers/lecturers who would operate the technology and integrate it into the curriculum. It should be emphasized here that the training should be continuous in form.
- v. Polytechnic/technical institutions should establish local area net works (LAN) to enable lecturers and students have free interaction and communications through computers. This is also known as intranetting.
- vi. There should be a systematic development of mainframe computing that would provide large-scale computing power needed in various application e.g in Modelling and Simulation, data base management, staff records, students records, examination records, and other administrative information.
- vii. Through the connection to the internet, encourage the use of e-library by staff and students. This is a way of enhancement of researches and project work.
- viii. To encourage the sufficient application of technology to curriculum uses and instructional pedagogy and access to the internet.

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