COMPUTER EDUCATION AND INFORMATICS: POLICY INSTRUMENTS IN NIGERIA.

James Tolorunloju Rowland
Department of Computer Science,
College of Education, Igueben.

Abstract
There is an increasing trend in the use of computers in our schools today. From kindergarten to graduate level, computers are being used for learning, bookkeeping, and research. This paper highlighted the use of a variety of Computer-Aided-Instruction (CAI) programs and educational software; including projected lesson plans of instruction in place of chalkboards. Several methods of achieving this were also discussed. These included tutorial, drill and practice, simulations, etc. Computer literacy and automation were evaluated relying on the analysis of secondary data. The study exposed the existence of several ad-hoc committees in Nigeria charged with the responsibility of working out informatics development in different sectors of the economy, including Universities, Polytechnics and Colleges of Education at both the federal and state level. Yet the efforts of these committees have not achieved the desired effects in terms of producing graduates that can be said to be “computer literate”. In conclusion, it was recommended that more computer teachers should be send for in-service training on the use of Computer Managed Instruction (CMI) programs to create, deliver, score tests and to store students’ grades and progress reports. Examination bodies, federal and state ministries of education and even parents, as important stakeholders, are encouraged to be active participants in computer education and informatics rather than being mere onlookers.

Introduction
The advent of globalisation and information economy has changed the objective of education. Education is no longer a vehicle used to simply convey a recognised body of knowledge but to enhance the ability of each learner to generate, access, adopt and apply knowledge and information to solve complex problems. Gone are the days of hypodermic needle method of teaching when teachers and academic practitioners saw themselves as knowledge oracles and “sages on the stage”, delivering data information, knowledge and wisdom to eager students whose minds were empty vessels waiting to be filled. Even if this reality was ever true, the world’s store of knowledge is increasing at an alarming speed. No one can adequately convey a comprehensive understanding of the
subject as can be conveniently absorbed by most students. (Adeleye, 2004).

**Educational Software**

There are three major types of educational software:

**Tutorials:** These programs are step-by-step instructions to teach facts, skills and concepts. Tutorials teach people how to operate a piece of equipment, use punctuations, read music, play the guitar and program computers.

Tutorials are rather like textbooks, except that they are interactive in nature. Information is presented in small units, each followed by questions that test the user’s comprehension. If incorrect answers are given, the program reviews the materials, perhaps presenting it in a different way.

**Drill and Practice:** These programs are used to reinforce skills in subject such as arithmetic, spelling, speed reading, foreign languages and typing. The programs are highly interactive. They keep track of user’s mistakes, then use this information to determine the level of difficulty and kind of questions to asked. Most of the drill programs have colours, sound, and graphics capabilities, and take the form of games. For example, a child may have to solve addition problems to outsmart roaring dragons. A good example of Drill and Practice software is Mavis Bacon, which teaches typing program.

**Simulations:** These programs imitate real events. How do you pilot a plane? What decisions need to be made to improve your candidate’s chance of winning in an election? What challenges would you face as head of Fortune 500 Company, and how would you handle those challenges? What happens during a volcanic eruption? Another instance of simulation software, is the chemistry laboratory in schools. Conducting experiment can sometimes be dangerous. There are educational computer programs, which allow the pupil to pretend to “mix” chemicals. The result can be shown on the screen, without any danger to the pupil or the laboratory. (Jacob, 2003).

**Computer Literacy and Automation in Nigeria**

Despite the fact that there are presently many computer installations in Nigeria, the awareness of the potentials of these computers and their relevance to our national development and well-being is just emerging.

The nation’s response to the growing data processing needs, as contained in the National Development Policy Plans have continued to witness the importation and sale of many computer hardware and software to clients.

As pointed out in a paper presented at the Computer Association's General Meeting, it was observed that:

1. The arrival of computer systems and technology in Nigeria preceded the availability of computer skill and knowledge in our educational system.
2. The need for computer education came as a response to the demands
of the public and private sectors of the economy.

3. Computer education, coming as it were, after the need for it was manifested in the economy, saw Nigerians dabbling into an area they knew little about.

4. From about 150 students in a typical Computer Science Department in 1975, there are over 400 Computer Science majors and 1000 others from faculties like Engineering and Physical Sciences that require offerings in Computer Science up to 200 or 300 levels. In addition, because of the recently implemented National Universities Commission (NUC) minimum standards, every university student must now take computer science courses at the 100 level at least. Though nothing has been done to improve facilities in the Computer Centres. Our Computer Science graduates will continue to emerge from the universities with their heads full of theories but absolutely lacking in practical experience.

5. It is estimated that there are about 6000 secondary schools in Nigeria. If each school were to have TWO computer science teachers to cover courses at the senior classes, one would need 12,000 qualified computer science teachers to man the schools.

6. Due to the strong job market for degree holders in Computer Science, fewer graduates continue with postgraduate studies in Computer Science.

7. Because Nigeria operates a free market economy, there is practically no control on the inflow of computer hardware and software into our market.

8. With no regulations or any framework of control or standardization in force, there is now diverse makes of computers most of which have started to end up as heaps of faulty electronic gadgets in the few maintenance workshops available. (Adesanoye, 1989).

Computer Education in Secondary Schools

As a means of advancing informatics (information science) applications in the country, pilot activities embarked upon by a number of State governments towards the introduction of informatics to the school curriculum, have now metamorphosed into full implementation in increased number of schools. Most states started with a pilot project of 4, 6 or 8 selected secondary schools within the state and by early 1994 these state governments have extended the facilities to at least one secondary school in each Local Government Area (LGA). There are about 744 Local Government Areas in Nigeria and over 6,000 secondary schools. To execute the programme, a number of teachers were trained for a couple of weeks either by a computer company or the Polytechnic, depending on the cost considered reasonable by the
government and in the case of the Federal Government Colleges, by the National Teachers Institute (NTI). These teachers have started to return to implement the introduction of informatics to the educational curriculum of schools.

Furthermore because of the present educational policies at the Federal, State and Local Government levels, the country operates an extensive network of primary schools, secondary schools and higher educational institutions. There are presently 18.7 million students enrolled in over 39.7 thousand institutions of various levels and types. Of the 18.7 million students in schools, less than 2 million have access to formal computer activities except in a very few private primary and secondary schools (about 1% of total number of schools) which are elitist in their set-ups and charge fees ranging from N20,000 to N50,000 per annum compared with an average of N500 per annum charged in public schools.

**Installation of Computers in Schools**

Following recommendations contained in the National Policy on Computer Education in 1988, Computers have now been installed in most of the forty-five Federal Government Colleges (FGCs) while little or no activity has been undertaken in majority of the state secondary schools which had promised at one time or the other to introduce computer education in their respective schools.

While some schools have reported faulty equipment, many others have either not installed the software into the systems or have not put the computer into use because most staff do not know how to install the computers or are afraid to do so for fear of their being damaged. On the part of the students, computer clubs have been formed and launched in a number of schools. With this trend, it is expected that students will learn more about computers under the umbrella of the clubs. (Aiyepuku, 1991; Amoda, 1979; Information Technology in Government, 1988).

**Informatics Programme at the Tertiary Level**

**1. University Level**

Since 1962 when the National Universities Commission (NUC) was set up following the recommendation of Ashby Commission, the NUC has been supervising and co-ordinating the activities of all the universities in Nigeria. The Commission has played a major role in the success of the Computer Literacy Programme in the universities. It has provided guidelines relating to the minimum hardware and software environment for the Universities to enable them effectively pursue the computer literacy programme. Additionally, the Commission has been supporting the development of curricula and programmes in the universities especially the new degree programmes in computer science and engineering covering the Bachelors, Masters and Doctorate degrees.

The computer literacy programmes at the university level have over the years been directed at: establishing and
entrenching a computer culture that permeates all activities in the University; producing university graduates who are considered computer literates irrespective of their course of studies or major disciplines; producing Computer Science and Engineering graduates who constitute the core of professionals in the practice and advancement of Computer Technology; conducting research and developing hardware, firmware, software, and course-ware that will enable the country to attain the latest Computer Technology capability; and ensuring the provision of the manpower and other resources required to meet the broader objectives of computer literacy at the tertiary, secondary and primary levels of education, and at the societal level.

2. Polytechnic and Colleges of Education Level

Apart from the NUC there is also the National Board for Technical Education (NBTE) which has statutory responsibility for ensuring standards of Education in Polytechnics and Technical Colleges, and also in co-ordinating the development, management and funding of Federal Polytechnics and Federal Technical Colleges. Within this general framework, the NBTE has had the following specific roles to play in the introduction of Computer Education in the institutions under its jurisdiction; integrating the curriculum for computer literacy at the secondary and tertiary levels, into the programmes of Polytechnics and Technical Colleges nation-wide.

Overseeing the development of Computer Education programmes at the Colleges of Education and Polytechnics.

Monitoring the polytechnics and Federal Colleges of Education (Technical) to ensure that they have incorporated tertiary level computer literacy into their general studies programmes, and that they have acquired adequate facilities for this.

Accrediting Computer Studies’ programmes at Technical Colleges level. Developing syllabus for a Higher National Diploma (HND) option in Computer Science and Technology immediately for adoption by Polytechnics, and encourage the programme in Polytechnics.

Reviewing the Polytechnics’ Computer Science and Technology programmes periodically.

Promoting and funding adaptive research in the polytechnics for the design, and development of computer hardware, software and firmware, power systems, thin-film technology and printed circuit boards.

Integrating the Management Information System scheme into its Computer Education programme.

Upgrading its in-house Computer capability to a level adequate to the demands of its statutory tasks. (Mugambi, 1991)

On the role of the National Library of Nigeria in the development of informatics, the committee observed that as an important parastatal under the Federal Ministry of Education, the National Library which is the national
depository for all books and publications for both within and outside Nigeria should also co-ordinate the procedures for computerising library services in Nigeria and the dissemination of any information with respect to computerisation of all libraries. It should also distribute any printed materials on computer education to schools, colleges and universities so that they are kept up-to-date about most recent developments.

As the experience in several countries that had introduced computer literacy programmes shows, the most appropriate place to start computer awareness programmes is at the school level and the most appropriate level within the education system is the secondary school level. Therefore the decision in 1988 of Government to start its pilot programme in the Federal Government Colleges was in keeping with what had proved successful for other countries and in line with the recommendations of the committee on National Policy for Computer Education in Nigeria.

The Committee on National Policy for Computer Education in Nigeria was also mandated to define, as clearly as possible, the roles of Federal and State governments and relevant institutions, particularly the universities, polytechnics, research institutes and some of the parastatals in the attainment of the objectives of Computer Education.

The major merit of the National Policy on Computer Education, therefore, is that it recommends the introduction/incorporation of computer studies at all levels lower than the universities and Polytechnics. As a matter of fact, the committee recommended a total lifting of restrictions on computer education in a way that computer literacy programmes can begin right from the primary school. According to the Committee, computers should be introduced at any level provided the necessary facilities and resources exist. (Aiyepoku, 1991)

**Conclusion**

This new multimedia-based learning system may give the next generation of students new ways to learn about our world. Using this new method, students can gain control over their own learning as the computer delivers instructions at the students’ desired pace, monitors their progress and provides instantaneous feedback.

A good computer education programme should therefore aim at not only teaching Nigerians how to use the computer effectively for national development but also at preparing them to master computer technology with a view to ensuring the maintenance, the designing of software, and eventually the production of computers.

**Recommendations**

Since educational institutions are increasingly taking advantage of new tools offered by the computer industries, teachers should be encouraged to go for in-service training on the use of specialized applications called Computer Managed Instruction (CMI) programs for creating, delivering, scoring tests, keeping tract of...
students grades and creating students’ progress reports.

Parents should be encouraged to make provision for computer CMI programs for their wards/children in schools, since the programs can deliver information to students in the form of sound and video in addition to text and pictures.

Examination bodies/agencies like West African Examination council (WAEC) and National examination Council (NECO) should include computer studies in their syllabuses. At this stage, computer practical should be examinable.

The federal and state ministries of education should make provision for funding computer at all levels.

It is necessary that our policy making process and agencies are made open and receptive to new ideas and techniques capable of articulating socio-economic challenges into policy needs for effective policy outcomes.

Maintain records of policy enactments with a view to ensuring coordination, coherence and stability in the policy process.

It is therefore imperative to complement these measures by ensuring the harmonisation of policy instruments, resources and the policy objectives of establishing a sound self-reliant national policy on informatics.

Policy formulation processes must thus be made not only responsive and adaptive to changing circumstances but also improved in such a way that identified distortions and factors responsible for institutional drift common in policy implementation are eliminated.

References


Journal of Teacher Perspective
