

DEVELOPING PRODUCTIVE COMPUTER SCIENCE CURRICULUM FOR NIGERIA

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Abstract

Science education viewed as integral to successful living must bequeath to the younger generations life coping skills to be effective citizens. Unfortunately, Jegede (2002) observed that science education and science teaching in Nigeria has gone skewed, static and insensate and must be fixed through a more responsive curriculum, relevant, appropriate and transferable skills from the classroom to real life experience. Computer science education, which is an aspect of science education, has its fair share of the problems of science education in terms of nonfunctional and ineffective curriculum. This paper examined the curriculum issues in science education generally, and computer science education in particular. It also traced the historical development of computer education in Nigeria, and exposed the bug in computer science education curriculum in Nigeria. Finally, it offered useful suggestions that could be adopted in solving the problem.

The primary objective of formal education among others include fostering the worth and development of the individual for each individuals sake, and for the general development of the society. In other words, it provides opportunity for the acquisition of appropriate skills and development of mental, physical and social abilities and competencies as equipment for the individual to live in and contribute to the development of the society (NPE, 2004). The import of these policy statements is that a recipient of formal education should have the potential to create jobs for himself and others after graduation.

But looking at what happens today, we find many school leavers roaming the streets looking for non-existing jobs. Greater percentage of these graduates are found unemployable in existing establishments, not to talk of creating jobs for themselves. Yet these school leavers are supposed to have passed through different tertiary institutions of learning established and certified by government for training and award of various degrees of certificates of learning.

One may ask, what the problem is, curriculum or methodology. After all, these half-baked graduates are products of schools that utilize the educational curriculum contained in National Policy of Education of Nigeria. There are indicators

that the problem lies within the embers of both curriculum and teaching methodology. Evidence abound that the effect of this malady predominates in science based discipline. Corroboration this in Ukwungwu (2003), Jegede asserted that science education and science teaching has gone skewed, static and insensate and must be fixed through a more responsive curriculum, relevant, appropriate and transferable skills from the classroom to real life experience. In Jegede's opinion the curriculum is not changing with time, and does not relate science education to productive work.

Rather, science education viewed as integral to successful living according to Ukwungwu (2003), must bequeath to the younger generation life coping skills to become effective citizens. Hence, an effective science education curriculum should focus on the objectives of National Policy on Science Education.

Development of Computer Education in Nigeria

The history of the computer system in Nigeria could be traced from 1963 when Nigeria conducted her national population census. The computer assisted in processing data collated from enumerators. However, the computer then was operated by non-Nigerians only due to computer literacy.

In the same 1963, International Business Machines (IBM), World Trade Corporation in conjunction with University of Ibadan had a working agreement to advance the use of modern data processing methods in Africa. Sequel

to this, an IBM African Education Centre was established to organize and conduct training programmes of various types on the application of computer. One of the objectives of the centre was to meet the objectives of Nigerians and other Africans in computer education. The IBM African centre served as training ground for early Nigerian computer users. By 1968 the centre was renamed Ibadan University Computing Centre. The aim of the centre was to conduct undergraduate courses in computer education and also provide administrative support for the University. The centre operated at this level until 1974 when the University established a department for computer services as a separate entity from the University computing centre. The philosophy upon which the department of computer science was established and the curriculum it operated centered on:

- a. Teaching undergraduates the basic theories of computer science.
- b. Giving expensive and effective experience in practical applications of the computer and,
- c. Inculcating in the students the right attitudes to the professional practice of computer science.

The department which was based in the Faculty of Applied Natural Sciences offered courses at undergraduate level only. By late 70s and early 80s, some first generation universities in the country started computer programmes. University of Lagos for instance had an extension computer programme for undergraduates and post-graduates. The extension programmes include: part-time and

evening courses for bankers, engineers, accountants, etc.

Today, computer education has become one of the most attractive programmes in all levels of our educational system. Computer studies are taught in nursery, primary, post-primary and tertiary institutions all over the country. Apart from computer training received under formal education system, private organisations and individuals conduct various types of computer education in Nigeria. Some computer business centres overnight became computer colleges for computer training programmes.

The Focus of Computer Education Policy

Computer education had its fair share of the problems of science education in terms of functional and effective curriculum. Virtually all the schools in each level of our education system operated a different curriculum in computer studies. There was no uniformity whatsoever in courses offered by the institutions. In 1988 government made a move towards arresting this ugly trend. The minister of education then Prof. Jubril Aminu announced the intention of federal government to introduce computer education in Nigerian secondary schools. In fact, a pilot training scheme for computer education was conducted in some Federal Government Colleges, Military schools and federal colleges of education (Owojori, 2000).

At the tertiary level, there was a serious step taken by government to

standardize computer education, especially in colleges of education and universities. Kanu (1990: 53) confirmed this in his report on the setting up of the National Committee on Computer Education and its terms of reference included planning for a dynamic policy on computer education and literacy in Nigeria, as well as devising clear strategies and terminologies to be used by the federal and state governments and other relevant organisations in introducing computer education in their institutions of learning. The committee invited the general public, including corporate bodies, institutions, professionals, manufacturers, computer users, vendors and consultants to express their views in form of memoranda, position papers or in any other documentary form in order to help the committee produce a computer education policy for the country. Specifically, the committee requested for contributions on two major areas: computer science and technology, and computer education.

Eventually, a committee for National Policy on Computer Education was inaugurated on 14th December 1987 by the Minister of Education, Prof. Jubril Aminu in Lagos. The first thing the committee did was to develop a policy on computer education, including computer literacy. The policy dealt with issues like selection, manufacture, application, maintenance, research and others with appropriate promotional activities and legislation.

The objectives of the policy include:

- To catch up with the rest of the world,

- To be ready to enter into the 21st century of high technology where computer will undoubtedly be at the center of it all as the most sophisticated and the most enabling tool,
- To be able to land on the jobs demanding computer knowledge,
- To enhance operational efficiency and management, and to open an almost infinite scope for human endeavor, and above all,
- To regulate the proliferation of microcomputer and its integration within the education system (Borishade, 2002).

The committee submitted its report in August, 1988. The report was broad based and specific: stating specifications, procedures and activities at primary, secondary, teacher training, polytechnics and colleges of education, and university levels. The policy specified objectives at these different levels and specifications for curriculum development. In chapter three of the report, it advised on the strategies and modalities for introducing pilot computer programme in the federal government unity secondary schools. It also sought to identify the most suitable and available hardware options, determine the optimum number of computers to be used in schools and specify the environment within which the computers would function best. It was also recommended that each pilot school be provided with eight computers, whereas the ideal ratio is one computer to one student. The ratio of one to one computer is the ideal or contemplated one, but it has not been achieved due to economic situation prevailing in the country. The

committee also recommended the procurement of one computer for school administration (Abimbade, 2000).

Developing Productive Computer Science Curriculum for Nigeria

Curriculum per say, comprises all the activities which takes place at the institution and the therefore contains not only the content of what must be taught, it also contains details of what must be assessed and how it should be done (Lombard, 2002). The fact that computer science education curriculum in Nigeria needs serious reform is not an over statement. The earlier step taken by the committee on national policy on computer education by inviting virtually all stakeholders in computer business for assistance in policy formulation on computer education was laudable. The policy as presented in the committee's report is fantastic, but it appeared the industrial sector was left out completely when the curriculum was being developed.

The industries and manufacturers that design and produce computer hardware and software, and the organisations that utilize the services of computers should be consulted for expert advice during curriculum planning and development. The advice of these experts should guide curriculum planners on how to tailor the curriculum content to productive work.

Furthermore, the curriculum should be such that the students are made to be in constant touch with the industries or consumers of computer products and services like their counterparts in health

sciences and the legal services. These two disciplines had their curriculum fashioned in such a way that the students are always in close touch with the hospitals or courts as the case may be. The six months, or one year industrial attachment otherwise known as Student's Work Experience Scheme (SIWES) provided in the curriculum presently does not yield the expected objective. Most of the students stay away from the exercise, while others prefer where they will make some financial gains, instead of building capacity in their chosen life career. This is so, because the scheme is not properly monitored and the participants are not examined adequately based on their activities at the industries. The natural sciences curriculum does not compare with the curricula for medical and law students. The curricula of these groups of students are planned in such a way that they are provided and equipped with life coping skills even before graduation. That is why most graduates of medicine (doctors) and law (lawyers) readily create job for themselves and others upon graduation.

More importantly, the world of today is powered and propelled by Information and Communication Technology (ICT). The computer happens to be the principal actor in the activities and innovations that characterize this age. The events of this information age changes so rapidly to the extent that it requires a dynamic education curriculum to keep pace with the new emerging trends of the time. Hence, Ukwungwu (2003) opined that the challenge to stake-holders in STM education in Nigeria in the light of the new

developments worldwide is to develop an appropriate curriculum that would achieve balance in both content and methodology. In other words, as new issues emerge in the computer industry, the curriculum should be promptly reformed to address the challenges posed by such innovations. Indeed, there is need now to introduce the current issues now in the field of computer studies into the curriculum to keep abreast with social consequences and new social natural phenomena. In this regard there is need now to inject new topics into the curriculum for it to be current and relevant. These topics include:

- a. Information Technology (IT);
- b. Information and Communication Technology (ICT);
- c. World Wide Web (WWW);
- d. The Internet;
- e. Electronic mail (E-mail);
- f. Cloud Computing;
- g. Data Mining and
- h. Mobile Apps.

Conclusion

Computer education is very important in the world of today, because the computer and the innovations it engenders has become the fulcrum for national development. It is only a responsive curriculum in computer education that can provide students with the much needed life-coping skills that makes them effective citizens.

Curriculum issue in computer education should involve all stakeholders in the production and utilization of computer products and services. Those already in the field should be given the

opportunity to make input on the training and production of their future work force. This will not only encourage the production of employable citizens, but also those who can create jobs for themselves and others. It is only by so doing that the objectives of the national Policy of Education can be achieved.

Recommendations

Computer system is one technology that has very wide application in all fields of human endeavor. People who are deeply involved in the utilization of computer services and those who make a living out of the numerous innovations created by the computer should be consulted in reforming computer education curriculum, especially at tertiary level of education.

Reforms in computer education programmes should be carried out according to emerging trends in computer industry.

Nigeria should endeavor to move along with the western world in adopting computer innovations into her computer education curricula.

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