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Technological Value of Computer in Handling Contemporary Issues in Engineering

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Abstract

Engineering is an essential discipline and profession needed for national development in Nigeria. A strong focus in computer technology is a means of enhancing activities associated with engineering. The paper discussed the technological value of computer in handling contemporary issues in engineering in Nigeria such as creation of employment opportunities in engineering, boosting of engineering education, and promoting productivity in engineering. Discussed in the paper were contemporary issues in engineering, computer as a valuable product of electronics, and application of computer technology in enhancing engineering activities. There were recommendations made to encourage the use of computer in handling contemporary issues in engineering.

Key Words: Computer, engineering, technology, development

Technology is a great path for man to survive and enjoy his environment. It should be noted that technology is anchored on science. Obianwu & Azubike (1994) asserted that technology is the knowledge of scientific principle applied to practical tasks with the purpose of reducing human suffering or for improved productivity.

A familiar and an essential technological product usually encountered in this contemporary era is computer. Computer is a product of electronic technology. Its usage is versatile for it is applied in almost every aspect of human activities. With the aid of software or program, the computer can perform various and numerous desired tasks. Computer has a technological value to the extent that a lot of operations in human environment can be carried out with computer; and computer has brought about information technology (IT) that enabled the world become a "global village".

An essential discipline and profession in which technological value of computer can be utilized in Nigeria is engineering. Engineering, by its nature, is scientifically and technologically based for it is concerned with the use of knowledge of science to make designs for production of devices and systems that reduces harsh and unpleasant conditions in an environment. Engineering is among the pillars for human and national development - advancements and innovations occurring in human society have a bearing with engineering. However, there are contemporary issues in engineering in Nigeria such as creation of employment opportunities in engineering, boosting of engineering education, promoting productivity in engineering. These contemporary issues are areas to be addressed so as to enhance activities in engineering. A good approach can be made on these contemporary issues using computer.

The paper is a discussion on utilizing the technological value of computer to handle contemporary issues in engineering in Nigeria. For explicit understanding, the paper focuses on: contemporary issues in engineering, computer as a valuable product of electronics, and application of computer technology in enhancing engineering activities. Certain recommendations are made to encourage the use of computer in handling contemporary issues in engineering to achieve development.

Contemporary Issues in Engineering

Engineering is a field of study and a profession that rest on the pivot of science (objective knowledge of natural phenomena) and technology (practical production of materials and systems). Idowu (1992) averred that engineering deals with the application of objective knowledge to the creation of plans, designs and means for achieving desired objectives, but technology deals with the tools and techniques for executing the plans. Nwosu (2010) view engineering as a discipline or activity that is in between science and technology for it deals with the use of scientific principle in design and production of materials and devices that make man feel more comfortable in his environment. Idowu (1992) asserted that engineering is a profession in which knowledge of mathematical

and natural science gained by study, experience and practice is applied with judgment to develop ways of economically utilizing the materials and forces of nature for the benefit of mankind. Usually, engineering activities are legally authorized to be carried out by engineers for the well being of human society. For meaningful engineering activities in Nigeria in this era of technological advancement certain contemporary issues in engineering need to be x-rayed: entrepreneurship to mitigate unemployment, promotion of engineering education, and enhancement of productivity.

One of the problems confronting Nigeria is the issue of unemployment. A lot of graduates of engineering are unemployed. It appears that there are low chances of getting employed in a paid job in engineering. So, entrepreneurship should be encouraged in engineering. Entrepreneurship is a source of self-employment for generation of income. Usually, unemployment negatively affects human development, but employment is an avenue to obtain money needed for solving problems and handling of human needs. Fortunately, engineering can encourage creativity and self-reliance needed for entrepreneurship in Nigeria. Obviously, there is the need to enhance the level of self-reliance in Nigeria, by the nation becoming strongly rooted in science, engineering and technology, to avoid depending on other nations for survival and wellbeing. So, it will be appreciated if Nigeria matches towards entrepreneurship in engineering so as to achieve great and dynamic economy signifying development.

There is great need to ensure that people (who are mostly youths) studying engineering are exposed to effective engineering education for sustainable development in Nigeria. As noted by Afolabi & Loto (2004), in recent times there has been a keen awareness that education constitutes the greatest instrument which could be used for solving the multifarious socio-economic problems of the nation and for the fullest realization of the potentialities and aspirations of the people. Igbemi (2006) posited that the essence of education is to solve the problems of life and education is life itself, not a preparation for life. Serious efforts are needed to educate engineering students because there are certain problems that militate against effective engineering education in Nigeria. One of the problems is that some engineering students find it difficult to understand some concepts and principles in engineering. It is also observed that some engineering students are not well focused (such that there is lack of interest and negative attitudes) towards studying of engineering. Another problem in engineering education is that there is inadequate supply of instructional materials and equipment needed for effective engineering education.

It should be noted that part of development in human society rests on the role and importance of engineering in making life enjoyable by people. It is an axiom that engineering, as an aspect of science and technology, is a vital resource in ensuring that social and infrastructural amenities are well created and maintained in an economy. Transport system, communication system, electricity supply, pipe-borne water, hospitals

and schools are some products that involve enhancement of productivity in engineering. Nwachukwu (1988) asserted that productivity is a measure of the output that results from a given resource input at a given time. For quantitative and qualitative yield of engineering products, enhancement of productivity in engineering activities is very expedient in Nigeria.

Computer as a Valuable Product of Electronics

Electronics involves the study, design, construction and application of devices whose operations are based on the conduction of electricity in vacuum (vacua), or gases or semiconductors (Chiwetalu, 2004); modern materials used in electronics are semiconductors. Computer is a great product of electronics; whenever electronics is mentioned, one of the electrical systems that can easily come to one's mind is computer. It can be said that construction and operation of computer involve the application of electricity in semiconductor devices. What actually is a computer? Computer system is an electronic device, consisting of a hardware (electrical circuitry) and software (set of logical instructions called programme), that reduces stress and difficulty in work by accepting input data, and uses the programme installed in it to processes the data with high speed and accuracy to generate an output (result). Johnwakalo (1995) view computer as a device that uses an intellectual map called programme to make decision, process word, publish, create graphics, choose, copy, move, compare, and perform other non-arithmetic on the many alphabetic, numeric and other symbols in the desired way. Ohayagha (2003) noted that computer is a device with high-speed electronic brain that accepts, analyzes, synthesizes and generates information by an operator.

Nwosu (2004) pointed out that computer system, as a vital electronic device with technological value, has certain characteristics: provision of accurate results, possession of high operational speed (saving of time in operations), high memory capacity for storage of data and information, flexibility in modification of data and information, maintenance of reliability in its operation, ability to handle complex tasks, performance of neat jobs, wide utilization in human endeavours (i.e. versatility in applications). Sadiq, Nnebe and Momodu (2004) noted that computer is useful in human endeavours for it is a machine used for fast generation, calculation as well as storage of information.

Application of Computer Technology in Enhancing Engineering Activities

Technology is the practical application of scientific concepts and principles in production of materials, devices or systems for making man's environment less harsh and then become more conducive and pleasant to live. Nwosu (2004) acknowledged that technology is vital in achieving progress and development in human society for it plays a vital role in alleviating the environmental problems of man. A prominent technology in

this modern era is computer technology. Computer technology deals with production and utilization of computer for the benefit of human society. Computer technology has been a valuable resource for enhancement of engineering activities.

Engineering is among the discipline which is highly needed for self-reliance and sustainability required to achieve development. Iroegbu (2006) rightly noted that engineering is the life wire of any nation for man has used engineering to exploit his environment to his advantage. Major revolutions that occurred in human society were made possible through engineering activities. Engineering activities consist of acquiring knowledge and skills as well as engaging in practices in engineering for socio-economic and technological wellbeing of human society; thereby positively influencing human life and activities towards development. For instance, in this modern era, revolution of human activities has occurred through electronic engineering. Electronic engineering has brought about modern means of communication as seen in information technology. As rightly noted by Inyiama (2004), important development in electronic communication has impacted on the way business, administration, education and government is conducted in the emerging world of the third millennium. Actually, engineering activities help in development by practically employing science and technology for comfortable and pleasant living. Usually, existence of scientific-based society will lead to production of people who are equipped in technology. Engineering has brought about technological products that foster the wellbeing of man in various areas of human endeavour such as transportation, health-care delivery, food production and processing, communication, security and housing.

One of the ways to enhance engineering activities for development is by use of computer to handle unemployment issue in Nigeria. Computer technology serves as a means of curbing social menace by creating opportunity for entrepreneurship, especially in this era of massive unemployment. Usually, unemployment does not augur well for national development for it can lead to social vices that inhibit development. With the application of computer in engineering, one can become an entrepreneur and a job-creator. The use of computer system in entrepreneurship can boost engineering activities for engineers that are entrepreneurs.

Entrepreneurship is concerned with establishment of business in which one is self-employed for the purpose of making a living and solving people's needs. Okenwa (2005) noted that entrepreneurship is the willingness and ability of an individual to seek out investment opportunities, establish and run an enterprise successfully. A person who engages in entrepreneurship is called an entrepreneur. Thus, an entrepreneur acts as a 'job creator' and not a 'job seeker'. Entrepreneurship demands creative and innovative mind; so, an entrepreneur is expected to acquire skills, ideas and managerial abilities needed for effective and efficient running of the business enterprise.

There are some job opportunities which the knowledge and utilization of

computer can be employed for entrepreneurship. Entrepreneurship can be accomplished in engineering by working as: an operator of computer system, computer programmer, designer of computerized system, computer tutor, consultant in computer-based operations, vendor of computer and computer-based products, and manager/proprietor in organization that is concerned with computer activities. Involvement in various self-employed works can promote self-reliance for generation of income. It is obvious that engaging in jobs enhances decent conduct and provides income for socio-economic wellbeing necessary for national development.

Computer technology can be applied in promotion of engineering education. Computer, as an educational device, can be used for electronic learning through the use of education software like Computer Assisted Learning (CAL) or Computer Aided Instruction (CAI). The education software can enable engineering students to revise any course material (subject matter) as often as possible for total mastery. Akudolu (2004), and Nwosu (2006) pointed out that CAI guides a student and enables him learn course materials at his own pace and evaluate himself.

Computer Aided Design (CAD) is a useful computer package (software) for scientific design that can be of technological value in engineering education. With CAD, one can learn through computer simulation, which enables creation of model of a real life system and experimenting or investigating on the model behaviour to determine the performance of the real-life system when built. Computer can also be used for education purpose by engaging in recreational activities like watching films, and playing games, in a manner that can promote intellectual enhancement. Thus, educational films and games for acquisition of knowledge and skill in engineering can be enjoyed using computer.

Computer can help to promote quality education in engineering by using it as a device for taking examination in form of computer based test (CBT). The CBT can contain objective examination questions pertaining to engineering. Students in such examination, in an effort to meet up with the time set for the examination, most times, focus on their individual tests without interacting from their examination neighbour(s).

Associated with use of computer in engineering education is information technology of which the Internet is a prominent aspect. Information technology is greatly utilized in this modern and digital age for dissemination and acquisition of information and knowledge. Inyiama (2004) acknowledged that Internet provides multimedia that facilitate acquisition of knowledge and skill in a manner that enables students to learn and grasp much more easily, even when the subjects are considered difficult using conventional techniques.

The nature of technology determines the level of productivity and improved technology increases productivity (Nwachukwu, 1988). Computer system is fast replacing manual tasks worldwide and so it is an essential technological device that has

helped man in his activities towards personal welfare and national development (Okwoche, 2004). Invention of computer serves as a useful assistance to manual labour since it quickens data processing activities or functions, and also computer can be used as mediators in facilitating communication, interaction, comprehension, stimulation, simulation, evaluation, assessment, synthesis, recreation, etc (Sadiq, Nnebe & Momodu, 2004). There is no doubt that computer operates such as to enhance productivity. As regards to productivity, computer can serve as an essential electronic machine needed to make engineering works easier for a higher yield of products. Ekemezie (2003) asserted that the purpose of computer system is to speed up problem solving and increase productivity.

Effective communication is needed to enhance productivity in engineering. It is an axiom that the major purpose of communication is to transmit information. Fortunately, computer can be used for storage and communication of information necessary to enhance engineering operations and activities. In this modern era, there exists the Internet that has made the world a global village. With the Internet, people engaged in engineering can communicate with people from any part of the world to enhance productivity, using facilities like electronic mail (e-mail), E-commerce, E-conferencing, online phoning, etc.

Conclusion

It is very hard for Nigeria to develop without strong orientation towards the study and utilization of science and technology. An aspect of science and technology is engineering. However, there are contemporary issues such as creation of jobs, fostering of education, and enhancement of productivity that need to be handled for boosting of engineering in Nigeria.

An electronic device that can be applied to handle the contemporary issues in engineering is computer. Computer by its nature offers technological values that can promote engineering activities as regards entrepreneurship, acquisition of knowledge and skills, and speedy operations with lesser stress. It should be noted that the modern world is electronic-driven, especially in area of computer; and so, if Nigeria effectively employs computer in engineering operations and activities the nation will advance to become a developed nation.

Recommendations

On the basis that computer is valuable in handling issues in engineering, it is recommended that:

1. Engineering students in Nigeria should focus on and have positive attitude towards the use of computer in their study of engineering.

2. People concerned with engineering activities should acquire literacy on effective use of computer.
3. Institutions and organizations concerned with engineering in Nigeria should computerize their activities.
- Government, organizations and well-to-do individuals should support the acquisition of computer for enhancement of engineering activities in Nigeria.
- Ethical conducts should be displayed by stakeholders in engineering to avoid committing computer crime in engineering activities.

References

Afolabi, F.O. & Loto, A.B. (2004). Functional education as a basis for economic and social reconstruction in Nigeria. *Nigerian journal of curriculum and instruction, 12* (2), 128 - 134.

Akudolu, L. R. (2004). *Computer assisted teaching and learning*. Enugu: John Jacob's Classic Publishers Ltd.

Chiwetalu, B.N. (2004). *Electronics (concepts, materials & devices)*. Enugu: Zik-Chuks Nig.

Ekemezie, P.N. (2003). *Newbies information technology*. Awka: J'goshen.

Idowu, M.O. (1992). *Engineers in society.* Apapa: Lemuel Oba and Assocation.

Igbemi, M.J. (2006) Refocusing on the skill development areas in primary school home economics curriculum. *Multidisciplinary journal of research development 7* (8), 85 – 88

Inyiama, H.C. (2004). Science and technology education in the 3rd millennium. In H.C.U. Ezema (Ed.). *Effective science and computer education programme in the new millennium.* Abuja: Famray Digital Prints.

Iroegbu, P.A.N. (2006) Engineering education and practice in Nigeria: the state of art. J*ournal of qualitative education, 2* (3), 6 - 11.

Johnwakalo, D. (1995). *Computer appreciation for beginners.* Awka: Futuretech.

Nwachukwu, C.C. (1988) *Management: theory and practice*. Onitsha: Africana-Fep.

Nwosu, F. C. (2004). Acquisition of computer education for manpower development. *Knowledge review, 9* (3), 92 – 96.

Nwosu, F. C. (2006). Utilization of electronics for promotion of quality education. *Journal of qualitative education*, 2 (3), 119 - 124.

Nwosu, F.C. (2010). Instilling quality education in science and technology among Nigeria children and youth for sustainable development in engineering. *Journal of engineering science and technology 5* (1), 58 - 61.

Obianwu, F.A. & Azubuike, N. (1994) *Educational technology media: characteristics and utilization.* Awka: Nuel-centi.

Ohayagha, C.S. (2003). Computer education and self-reliance. *Knowledge review, 7* (5), 66 - 68.

Okenwa, C.P. (2005). *Entrepreneurship development in Nigeria: a practical approach (2nd ed.)*. Enugu: Snaap Press Nigeria Ltd.

Okwoche, J. (2004). Impact of computer education on manpower development. *Knowledge review, 9* (3), 66 – 67.

Sadiq, I. F., Nnebe, S.E. & Momodu, I.B.A. (2004). Computer education: the frontier for information technology in Nigeria. *Nigeria journal of research and production (nijorep), 4* (2), 111 – 118.