THE CRITICAL ROLES OF EDUCATION IN ACHIEVING SUSTAINABLE DEVELOPMENT

V. N. Ogakwu, (Ph.D)

Abstract

Education is the prime driver of sustainable development. All aspects of education have critical roles to play in achieving sustainable development. The roles of the following aspects of education in sustainable development have been examined in this paper:. Future education, Basic education, interdisciplinary and Re-orientation education, Student-centered education, Authentic education, Gender education, Citizenship education, Education for Culture of peace and Respect for Human Rights, Health education, Population education, Education for Protecting and Managing Natural Resources, Education for Sustainable Consumption, Adult and Community education, Technical and Vocational education, Higher education and Teacher education. It is recommended that all aspects of education be developed and employed for sustainable development in all countries.

Introduction

Since 1992, an international consensus has emerged that achieving sustainable development is essentially a process of learning. The critical role of education was stresses at all the major United Nations conferences following Rio including those on human right in Vienna in 1993, population and development in Cairo in 1994, small Island developing states in Barbados in 1994, social development in Copenhagen in 1995, women in Beijing in 1995, food security in Rome in 1996, and human settlements in Istanbul in 1996. Just as we had learnt to live unsustainably, we now need to learn our way out to learn how to live sustainable. Education for sustainable development is an emerging but dynamic concept the encompasses a new vision of education, which seeks to empower people of all ages to assume responsibility for creating a new sustainable future (Hopkins et al 1996).

Linking social, economic, political and environmental concern is a crucial aspect of suitable development. Creating such links demands a deeper, more ambitious way of thinking about education as one that retains a commitment to critical analysis while fostering creativity and innovations. In short, it demands that education promotes a system of ethics and values that is sensitive to cultural dialogue, democratic decision-making and the appropriate use and management of natural resources. Seen as a social learning for sustainability, education can increase concern about sustainable practices and increase our capacity to confront and master change. Education not only informs people, it can change them. As a means for personal enlightenment and for cultural renewal, education is only central to sustainable development; it is humanity's best hope and most effective means in the quest to achieve it. (Scott and Gough, 2004).

The Concept of Education for Sustainable Development (ESD)

Clarifying the concept of education for sustainable development was a major challenge for educators during the last decade. Some people argued that educating for sustainable development ran the risk of indoctrination, while others wondered whether asking schools to take a lead in the transition to sustainable development was asking too much of teachers.

Consequently, many international, regional, and national initiatives have contributed to an expanded and refined understanding of the meaning for sustainable development. For example, the Education International, the major umbrella group of teacher's unions and associations in the world, issued a declaration and action plan to promote sustainable development through education. Similarly, statements and guidelines were issued in support of reorienting education by regional councils of ministers of education and/or environment in the European Union, in Asian-Pacific Economic Co-operation (APEC), Organization of American States (OAS), and the South African Development Community (SADC) countries and the South Pacific.

Many regional strategies or action plans have been developed. A common call in all of these is the need for an integrated approach through all government ministries (e.g. education, health, environment, finance, agriculture, industry and consumer affairs etc) collaborates in developing a shared understanding of and commitment to policies, strategies and programmes of education for sustainable development. International conservation organizations, such as the World Wildlife Fund (WWF) and the International Union for Conservation (IUC) are also actively promoting the integration of education into sustainable development at local community, national and eco-regional scales. In addition, many individual governments have established committees, panels, advisory councils and curriculum development projects to discuss education for sustainable development, development policy and appropriate support structures, programmes and resources and fund local initiatives (Scout and Gough, 2004). These many initiatives illustrate that the international community now strongly believes that we need to foster through education, the values, behaviour, and lifestyle required for a sustainable future.

Future Education

For thousands of years human societies have proved that living sustainably as healthy and happy individuals within caring, stable families and communities in harmony with the natural world is possible. The long-term sustainability of indigenous economic and cultural systems is the result of indigenous systems of education that established a human and natural ecology totally in union with each other. Unfortunately, indigenous knowledge and wisdom have been undermined by the experience of colonization, industrialization and globalization. By and large, indigenous priorities and systems of education have been supplanted by the somewhat narrow view that culture and the environment are valuable only in so far as they are economically productive. The consequent disregard for the land and culture has meant that knowledge, values and skills for living sustainably have been underplayed in contemporary education.

Future education, if it is true that all education is for the future, needs to become more explicit element in all levels of education. As education for sustainable development is education for a future that we cannot yet predict, it is important that education programmes seek to develop skills for understanding and anticipating change and for facing the future with courage and hope. This would involve coming to realize that the future is a human creation, made by our decisions, and that in a democratic society; people have the right, in deed an obligation, to contribute positively to a sustainable future. This would involve learning how to learn, how to analyze and solve complex problems, how to think creatively and critically about the future, and how to anticipate and make our histories. These contribute to the stall of foresight and are all aspects of future orientation in education.

Education for sustainable development has come to be seen as a process of learning how to make decisions that consider the long-term future of the economy, ecology and social well being of all communities. Building the capacity for such future-oriented thinking is a key task of education. This represents a new vision of education, one that helps students better understand the world in which they live, addressing the complexity and interconnectedness of problems, such as poverty, wasteful consumption, environmental degradation, urban decay, population growth, gender inequality, health, conflict, and the violation of human rights and threaten our future. This vision of education emphasizes a holistic, interdisciplinary approach to developing the knowledge and skills needed for a sustainable future, as well as changes in values, behaviour and lifestyles. This requires us to reorient education systems, policies and practices in order to empower everyone, young and old, to make decisions and act in culturally appropriate and locally relevant ways to redress the problems that threaten our common future. In this way, people of all ages can become empowered to develop and evaluate alternative visions of a sustainable future, and to fulfill these visions through working creatively with others.

This vision emphasizes the key role of educators as agents of change. There are over 60 million teachers in the world and each one is a key agent for bringing about the changes in lifestyles and systems that we need but education is not confined to the classroom of formal education. As an approach to social living, education for sustainable development also encompasses the wide range of learning activities in a basic and post-basic education, technical and vocational training, tertiary education, and both non formal and informal learning by both young people and adults within

their families, workplaces, and in the wider community. This means that all of us have important roles to play as both "learner" and "teachers" in advancing sustainable development. (Eneh, 2009).

Basic Education

Basic education provides the foundation for all future education and is a contribution to sustainable development in its own right. Its goal, as concerns those in the pre-school and primary school-age population, whether enrolled in school or not, is to produce children who are happy with themselves and with others, who find learning exciting and develop inquiring minds, who begin to build upon as storehouse of knowledge about the world and more importantly, an approach to seeking knowledge that they can use and develop throughout their lives. Basic education is also integral to lifelong learning especially in increasing the level of adult literacy. Basic education is aimed at all the essential goals of education: learning to know, to do, to be (that is to assume one's duties and responsibilities) and to live together with others, as outlined in Education. "The Treasure Within," the Independent Commission on Education for the 21st century report, published in 1996 by (United Nations Educational Scientific and Cultural Organization (UNESCO) is thus not only the foundation for lifelong learning but also the foundation for sustainable development.

Access to basic education is a major requirement for poverty eradication. Indeed, poverty cannot be eradicated without education. However, 110 million 6-11 year-old still do not attend primary school. Millions more attend only briefly often for a year or less then leave without the most essential elements of a basic education or the skills to make their way in an increasingly complex and knowledge-based world. These will join the nearly 900 million adults, the majority of whom are women, who cannot read. Those denied an education suffer enormous social and economic disadvantage. They are amongst those with the poorest health, lowest housing standards, and poorest employment prospects in the world. In fact, they have less of nearly everything in life, except children. In Peru, for example, women with ten or more years of education have an average of 3:2 children, whereas women with no education have an average of 7:4 children. In other countries, the difference is less extreme, but still sizeable. Nearly everywhere, higher levels of education, especially for girls and women, reduces the average size of families, while contributing to the health, well-being and education of children.

In 2000, a world Education Forum was held in Dakar, Senegal to develop ways of achieving basic education for all. Six goals are central in the resultant Dakar framework For Action:

1. Expand and improve comprehensive early childhood care and education, especially for the most vulnerable and disadvantaged children;
2. Ensure that by 2015 all children, particularly girls, children in difficult circumstances and those belonging to ethnic minorities have access to and complete free and compulsory primary education of good quality;
3. Ensure that the learning needs of all young people are met through equitable access to appropriate learning and life-skill programmes;
4. Achieve a 50 percent improvement in levels of adult literacy by 2015, especially for women as well as equitable access to basic and continuing education for adults;
5. Eliminate gender disparities in primary and secondary education by 2005, and achieve gender equality by 2015, with a focus on ensuring full and equal access to and achievement in basic education of good quality;
6. Improve all aspects of the quality of education and ensure excellence of all, so that recognized and measurable learning outcomes are achieved by all, especially in literacy, numeracy and essential life skills.

These goals make the links between basic education very clear. Indeed, the Dakar framework for Action states: Education is the key to sustainable development and peace and stability with and among countries, and thus an indispensable means for effective participation in the societies and economies of the twenty-first century (Clover et al 2000).

Interdisciplinary and Reorientation Education

There is the need to re-orient many existing education policies, programmes, and practices so that they build the concepts, skills, motivation and commitment needed for sustainable development. Re-orientation Education addresses the re-orientation of educational systems in terms of how to

prepare people for life, for job security, for the demand of a rapidly changing society, for technological changes that now directly or indirectly affect every part of life and ultimately for the quest for happiness, well being and quality of life.

Core themes and key lesson are identified for re-orienting education policies, programmes and practices towards sustainable development. These include interdisciplinary student centered learning, and an emphasis on future education, citizenship education, education for a culture of peace, gender equality and respect for human rights, population education, health education for protecting and managing the natural resource base economic and social development, and education for sustainable consumption.

Interdisciplinary and Reorientation Education for sustainability requires us to work increasingly at the interface of disciplines in order to address the complex problems of today's world. What people will need to know in ten, fifteen, thirty and sixty years cannot be reliably predicted. It is predictable, however that such developments will not fit neatly into the disciplinary boundaries that have been in place for more than a century. Hence, understanding and solving complex problems is likely to require intensified co-operation among scientific fields, as well as between pure and mathematical sciences and the social sciences, arts and the humanities. Reorienting education to sustainable development will, in short, require important, even dramatic, changes in the way we think of knowledge (Eneh and Owo, 2008).

Student-Centered Education

Student-centered education provide for learning participation in the decision that affect their lives is a key element in the United Nations Conventions on the Rights of the Child. Learning how to participate requires that children and young people have opportunities, within the safety of a learning environment, to practice decision-making. This may be done through curriculum and assessment policies that encourage the development of self-esteem and personal responsibility, and of skills for learning how to learn. For critical thinking and for active participation, space needs to be left in the curriculum for students to plan their own learning goals and methods, as and when appropriate, and for self-and peer-assessment (Sterling, 2001).

Authentic Education

Authentic education is resource-based teaching enquiry and discovering learning, values clarification and analysis, problem-based learning, simulation games and role-play, and learning through community problem solving. It is student-oriented approach to learning that needs to be encouraged. Such an approach encourages authentic or "deep learning" rather than "shallow learning" of rote recall memorization for examinations. Authentic learning relates to everybody issues and future concerns. It proceeds at the pace at which individuals learn well rather than imposed schedules and standards. Authentic education engages the "whole person", body, mind, and spirit in the learning process and creates enthusiasm, insight and reflection, as well as compassion, energy and a commitment to working individually and with others to build a sustainable future (Scott and Gough, 2003).

Gender Education

This provides education for gender equality. Women have been and remain the deciding influence on the quality of life and well being for their families and communities. In most cultures, they are the primary-caregivers and managers of natural resources, including food, shelter and the consumption of goods. In addition, women have jobs and careers. But, the general failure to provide equal opportunities for women to pursue education and economic self-sufficiency has meant that a disproportionate number of women are poor and marginalized. These social barriers-exclusion, low status and poverty- are also barrier to a sustainable future.

These facts make the education of girls and women a priority for sustainable development. It also means that all people male and female need to learn about the issues of gender and sustainable development, and to learn within environments that are sensitive to the learning needs and styles of both males and females. Curriculum materials aimed at promoting such understanding are being produced in most countries. Education systems and schools are also developing policies that promote gender quality within educational processes, while teacher education programmes are drawing

attention to the importance of including a gender perspective in all subject areas. UNESCO, national governments and many organizations are also seeking to advance the participation of girls in science, mathematics, and information and communication technologies. These are important beginnings in the process of promoting gender equality in and through education (Scott and Gough, 2003).

Citizenship Education

Citizenship education provides education for democratic societies, informed and active citizenship. It is a primary objective of educating for a sustainable future. Around the world, efforts are being made to integrate citizenship objectives into the formal curriculum. This has involved the promotion of content themes as well as teaching, learning and assessment processes that emphasize values, ethical motivation and ability to work with others to help build a sustainable future. The global spread of democracy has expanded electoral enfranchisement and meant that adult education for citizenship is also expanding.

A key aspect of citizenship education within the context of sustainable development is international understanding. This helps bring understanding of the links between local and global issues. It also means that young people can be given opportunities to examine their own cultural values and beliefs, to appreciate the similarities between people everywhere, to understand the global contexts of their lives to develop skills that will enable them to combat prejudice and discrimination. In these ways, students can use their knowledge, skills and commitments to plan an active role in the global community (Baker, 2006).

Education for Culture of Peace and Respect for Human Rights

A key pillar of education is learning how to live together in peace and harmony. This involves, first, strengthening one's own identity, self-worth, and self-confidence and then learning to appreciate the culture of others, to respect others as individuals and groups and to apply the same ethical principles to decisions about other people that one would apply within one's own culture (Baker, 2006).

Health Education

A child's ability to attain her or his full potential is directly related to the synergistic effect of good health, good nutrition and appropriate education. Good health and good education are not only ends in themselves but also means, which provide individuals with the chance to lead productive and satisfying lives. School health is an investment in a country's future and in the capacity of its people to thrive economically as individuals and as society. Thus, good health and nutrition are both essential; inputs and important outcomes of basic education. Children must be healthy and well-nourished in order to fully participate in education and gain its maximum benefits. Early childhood care programmes and primary schools that improve children's health and nutrition can enhance the learning and educational outcomes of school children especially girls and thus for the next generation of children as well. In addition, a healthy, safe and secure school environment can help protect children from health hazards, abuse and exclusion. A healthy population and safe environment are important pre-conditions for a sustainable future (Soubbotina, 2004).

Population Education

Population education plays a vital role in the quest to ensure that the basic needs and well being of all the world's people are met. This is also the ultimate goal of population policies. Sustainable development, above all else, requires new ways of thinking and acting. Within the context, the relationship between education and population needs to be seen in the broader context of the struggle to overcome poverty, to promote justice and equity and to ensure respect of the environment and the right of future generations to live healthy and fulfilling life (Baker, 2006).

Education for Protecting and Managing Natural Resources

Education, in all its forms can make a major contribution to protecting ecosystem and integrating natural resource management and energy conservation through promoting awareness, knowledge skills, values and action objectives. Biodiversity education is well served by many Non-Governmental Organizations (NGOs) concerned for local and global ecosystems. Many energy

producers have developed Energy education programme that integrate social and environmental issues into broader lesson about the physics of electricity, alternative and renewable energy sources. Water is the most precious hence water must be significant theme in education for sustainable development. Governments, water authorities, conservation NGOs and Community-Based Organizations (CBOs) have all played prominent roles in establishing action-oriented water quality action project that links school with their local communities and environment (Soubbotina, 2004).

Education for Sustainable Consumption

Consumption lies at the heart of the debate about sustainable development, as it covers people's right to live and work in a clean environment with good health and social conditions. However, sustainable consumption and sustainable lifestyle depend on context and culture. For example in developed countries, major changes are needed to reduce the impact of consumption, whereas in developing countries, consumption levels may need to rise in the interests of global quality, otherwise, the basic human needs for food, water, housing, education, health and transportation for the people who lives in developing countries may not be met (Baker, 2006).

Adult and Community Education

Action towards sustainable development ultimately depends on public awareness, understanding, and support. In democratic societies, public policy responds to the will of the people. It is here that public awareness and understanding of the need for sustainable development counts. It expresses itself through support for law, regulations and policies favourable to the environment. Consequently, there is need to move beyond awareness raising and to engage people critically creatively in their own communities in planning and engaging in action for socially just and ecologically sound development at the local level. (Baker, 2006).

Technical and Vocational Education (TVE)

TVE is vital to two of the most urgent human resources problems facing global society. These are development of appropriate skills for sustainable development and addressing the high levels of unemployment and under-employment in many countries. TVE trains technicians who operates at the interface of nature, technology, economy and society and have a key role to play in helping society resolve environmental and development issues. They tackle challenges, such as re-orienting technology and managing risks, meeting essential needs (such as food, water and sanitation) and at the same time, conserving natural resources and reducing energy and resource consumption. Technicians, who are aware of and have acquired practical skills for sustainable development, can ultimately apply more sustainable practices, as they are the ones who are involved in production.

Recognizing the crucial role of TVE graduates in devising and implementing practical solutions to problems, such as environmental degradation, the UNESCO international congress on Technical and Vocational Education stressed that TVE systems should not only focus on economic dimensions, but should also incorporate emerging issues, such as use of environmentally sound technology. The popular economy has become the main vector for productive activity for the majority of the world's poor, especially those living in the world's rapidly expanding cities. It represents the last resort against extreme poverty, youth unemployment, and social exclusion, and is made up of a multitude of small businesses, often family-run but also of individual activities run by women and youth. Jobs vary greatly and include recycling discarded household equipment, repairing machines, sewing, selling, transporting water, making craft goods, and operating market stalls. To contribute effectively to sustainable development, TVE also needs to address training needs for these jobs (UNESCO, 2005).

Higher Education

Higher education has a crucial role to play in sustainable development. In the decade since the earth summit, many higher educational institutions worldwide have made significant efforts to incorporate sustainable development into academic programmes, research community outreach, and their management operations. Universities can also render a valuable service by integrating components of sustainable development into their outreach programmes for teachers, senior managers, and local leaders, such as mayors, parliamentarians, and others in leadership positions.

They can also play a key role in international co-operation, and perhaps, could do so more effectively if they gave fuller consideration to developed and under-developed countries research partnerships to conduct interdisciplinary inquiries into environmental and development issues (Baker, 2006).

Teacher Education

There are over 60 million teachers in the world, and every one is potentially a key agent for bringing about changes in value and lifestyles needed for sustainable development. Consequently, innovative teacher education is needed to tap this potential (OECD/DAC, 2006). The administration and facilities of teacher education have the potential to bring about tremendous change, because they create education curriculum, train new teachers, provide professional development for practicing teachers, consult with local schools, and often provide expert opinion to regional and national ministries of education.

Key initiatives around the world to promote teacher education for sustainability over the past decade include:

- A Toolbox in-service education project conducted by the National Consortium for environmental Education and Training in the United States;
- Diverse initiatives in the United Kingdom (UK) sponsored by the WWF, forum for the future, the UK panel on Sustainable Development, and several local education authorities;
- The Environmental Education Initiative in Teacher Education in Europe;
- The UNESCO learning for a sustainable Environment. Innovation in Teacher Education Project in Asia and the Pacific;
- A professional development programme for over 70 teacher education colleges in the province of Karnataka in India;
- A network of teacher education and resource centers in China sponsored by the WWF;
- A national education programme in New Zealand that has trained over 40 people to provide in-service training for teachers in their regions;
- A national education programme in South Africa that has appointed and coordinated in each province, established a range of curriculum and resource development projects, and is developing a national structure for the accreditation of teachers who complete the courses;
- An international network of some 50 teacher education institutions, each of which is conducting a project to reorient all or part of its pre-service curriculum towards sustainability, facilitated by the UNESCO Chair for the Reorientation of Teacher Training to Address sustainability at York University (Canada);
- The on-line and CD-ROM based multimedia teacher education programme, Teaching and Learning for a sustainable Future, developed by UNESCO as a demonstration project for adaptation and transactions to suit local educational cultural contexts (OECD/DAC, 2006).

Conclusion

Education is the prime mover of sustainable development. No single aspect of education alone can drive sustainable development; various aspects of education must be combined to drive sustainable development. The critical roles of the various aspects of education in sustainable development have been examined in this review paper, which highlights: Future education, Basic education, Interdisciplinary and Re-orientation education, Student-centered education, Authentic education, Gender education, Citizenship education, Education for Culture of Peace and Respect for Human Rights, Health education, Population education, Education for Protecting and Managing Natural Resources, Education for Sustainable Consumption, Adult and Community education, Technical and Vocational education, Higher education, and Teacher education. The level they are given a chance, the higher the chances for sustainable development in the country and indeed the globe.

Recommendation

It is, therefore, recommended that all aspects of education should be developed and employed for sustainable development in all countries.

References

Baker, S. (2006), *Sustainable Development*, New York; Routledge.

Clover, D.S.; Follen F. & B. Hall (2000), *The nature of transformation: environmental adult education*, 2ed, Toronto: University of Toronto Press.

Eneh, A.N. (2009). Education for sustainable development. *Sustainable human development review*, Vol.1 (1): 141-151.

Eneh, O. C. & Owo, N.J.(2008), Sustainable Development – A review, *International Journal of Development Studies*, Vol.3 (3): 100-103

Hopkins, C.; Damalamian, J.; Lopez F. & Opine, G. (1996), Evolving towards education for sustainable development: an international perspective, *Nature and resources*, 32(3): 2-11.

OECD/DAC (2006). The challenges of capacity building: Working towards good practice, *Paris*, Vol.34 (2007): 12

Scott, W. & Gough, S. (2003). *Sustainable development and learning*; London: Routledge Falmer.

Soubbotina, P.T. (2004), Beyond economic growth: An introduction to sustainable development, 2ed. Washington D.C.: The International Bank for Reconstruction and Development/World Bank.

Sterling, S. (2001). *Sustainable education*, Totnes: Green Books.

UNESCO (2003). Sustainable development: an evolving concept, UN decade for sustainable development 2005-2014 draft international implementation scheme.

UNESCO (2005). UN decade for sustainable development, UN decade for sustainable development 2005-2014 Draft international implementation scheme.

THE ROLE OF CREATIVITY IN VISUAL ARTS FOR DEVELOPMENT

Tebu Ovie

Abstract

"Creativity is the ability to produce new and original ideas and things; inventiveness", Uzoagba, 2000. Creativity is constructive, active and central to, but not limited to Visual Arts. It involves improvement through questioning, inquiring, searching, manipulating, and experimenting to find out the truth. Also, it is important to stress that creativity is productive, hence, this paper aims at revealing the active and productive role of creativity for development. It may be considered as a kind of fortress of potentialities applied for individual and societal development. In this paper, the nature of creativity, resources that aid creativity, and some developmental accomplishments that underpin the role of creativity are presented. It is concluded that creativity applied by individuals results in developmental triumphs/accomplishments. For this reason, it is recommended that Government and the individual should strive towards total development through creativity.

Introduction

This paper begins with a brief examination of key concepts in the topic. The concepts revolve around the expressions "creativity", and "visual arts".

What is creativity?

Creativity is a word that comes up often when talking about art, but what is creativity exactly? The Oxford Advanced Learners Dictionary defines the word "create", as "to make something happen or exist …" This definition simply means bringing into reality an event, product, or thing. The Longman Dictionary of Contemporary English defines the word in another way. According to Uzoagba, (2000), the dictionary defines the word creativity as the ability to produce new and original ideas and things; inventiveness. This definition, no doubt, has the same implied meaning as the first.

In his book, "Understanding Art in General Education, Uzoagba, (2000), presents some interesting comments on the term creativity which are presented and analyzed below.

1. "Creativity is …constructive, productive behaviour that can be seen in action or accomplishment"- emphasis mine, (Lowenfeld and Britain, 1975). It is interesting to note that creativity is active, not passive, as it may be seen as a behaviour which is not only constructive, but productive. Worthy of note also is the fact that creativity results in accomplishment, or achievement. Furthermore, the definition does not restrict creativity to any field, hence, creativity may be applied in any career field for development.
2. "Creativity is the ability to invent new symbols and ideas, to improve on established symbols, to rearrange established organizations into new organizations and to integrate new or borrowed ideas into previously organized systems or situations, (June)". A large part of this definition implies that inventiveness does not exist in isolation but draws from the individual's knowledge of established symbols, organizations, ideas, systems or situations – it draws from resources. It is worthwhile to note that this is both a definition and an allusion to the nature of creativity.

   The following comment further sheds some light on the nature of this word "creativity" by rather subtly addressing the issue of individual development of one's creative ability through identified processes.
3. "Creative learners learn by questioning, inquiring, searching, manipulating, experimenting, even playing around, but always find out the truth". Paul Torrance: (1962).

   On the meaning of Art, Longman Dictionary of Contemporary English has some definitions that include the following.

1. "The use of painting, drawing, sculpture etc to represent things or express ideas…"
2. "Objects that are produced by art, such as paintings, drawings etc…"
3. "The ability or skill involved in doing or making something …"

The list of definitions above simply indicates the fact that the Visual Arts readily come to mind when the word "Art" is mentioned. However, for the purpose of this paper, preference is given to the last definition that emphasizes "skill" in "doing" something, regardless of whether what is done is drawing, painting, or anything else. That is, this preference has its basis on the scope of its application to Visual Arts, as well as any other discipline.

Ibrahim, (2000), traces the etymological beginning of the word Art to a Latin word "Arti," which means "to do well". According to him, Art is a name that is given to all skilful activities and is broadly divided into two, namely Visual and Non-visual Arts. He clearly distinguishes between these two forms of art by asserting that Visual Arts refer to those aspects of art with products which are visible, while Non-visual Art refers to those with products which cannot be seen with the naked eyes, divisions of Non-visual Art being Performing and Literary Arts. Divisions of Visual Arts are also given by him - Fine and Applied Arts.

It is a truism to say that creativity starts in the mind and involves ideas or imagination. And, imagination precedes actualization of ideas. Uzoagba, (2000), alluded to this position. According to him, works of art have to be conceived in the mind of a man, or group of men, and then made communicable to other men by the creative skill of the designer working in some medium that can be perceived by the senses through the eye, ear, and hand.

The Nature of Creativity

This paper shall examine the nature of creativity by studying varied characteristics exhibited by creative people. Getlein, (2002), observes that the exact nature of creativity remains elusive but that, there is general agreement creative people tend to possess certain traits. Such traits as presented by the author are as follows.

Sensitivity	Flexibility
Fluency	Originality
Analytical skill	Playfulness
Organizational skill	Productivity

Getlein, in the book "Living with Art", writes short notes on each item in the list above – the author refers to "sensitivity" as heightened awareness of what one sees, hears, and touches, as well as responsiveness to other people and their feelings. By, "flexibility" is meant an ability to adapt to new situations and to see their possibilities; willingness to find innovative relationships. "Originality" refers to uncommon responses to situations and to solving problems. By the word "Playfulness", the author refers to a sense of humour and ability to experiment freely. The next word, "Productivity" refers to the ability to generate ideas easily and frequently, and to follow through on those ideas. "Fluency" is examined in the text to mean a readiness to allow the free flow of ideas, "analytical skill" to mean "a talent for exploring problems, taking them apart, and finding out how things work. Finally, the ability to put things back together in a coherent order has been seen as "organizational skill".

Another, but similar list of characteristics that are exhibited by creative people, is presented by a different author, Uzoagba, (2000), in his "Understanding Art in General Education". He posited that the creative person has specific attributes, abilities or skills that he uses during creative process. He listed the attributes as

a. Sensitivity to problems (awareness).
b. Ideational and associational fluency (many ideas).
c. Flexibility (ability to change).
d. Originality and redefinition (ability to improve and adapt).

A comparison between the sets of characteristics possessed by creative people as presented by the two authors reveals a glaring agreement, which can even be seen in the common choice of the words "sensitivity", "flexibility", and "originality". The fourth in the list given by Uzoagba – "ideational and associational fluency (many ideas)", means productivity of ideas in the context of the work of Getlein M.

Having seen from the above the active, not passive, productive nature of creativity, and behavioural (overt) manifestations of creativity by people who are creative, it is quite imperative that the covert or intrinsic operations which give birth to the observable manifestations, attitudes, or traits with respect to creative people be studied at this juncture in this discourse.

Emotions provide drive for human beings to carry out actions. In the book, The Science of Mind and Behaviour", the duo Michael and Ronald, (2004), observe, "Emotions have important… functions". According to the authors, positive emotions such as interest, joy, excitement, contentment, and love have important adaptive functions, that, they help us broaden our thinking and behaviour so that we explore, consider new ideas, try out new ways to achieve goals, play and savour what we have, (emphasis mine). One does not need a stretch of imagination to see that the underlined, in fact, portrays the creative way of doing things. This author, therefore, infers that emotions give rise to creativity.

In respect of the obvious place of emotions in creative development and creative prowess of an individual and by extension, a society, this paper proceeds to examine the meaning and place of "motivation" in the nature of creativity. Encyclopaedia Britannica (Ultimate Reference Suite) considers motivation as forces acting either on or within a person to initiate behaviour. According to this source, the word is derived from the Latin term *motivus* (a moving cause), which suggests the acting properties of the processes involved in psychological motivation. The forces acting on an individual are external stimuli while those acting within the individual are internal. The words "pushes" and "pulls" are used to classify motives. Hence, Encyclopaedia Britannica (Ultimate Reference Suite) regards push motives as those that concern internal changes that have the effect of triggering specific motive state, while pull motives represent external goals that influence one's behaviour towards them. However, it was admitted that most motivational situations are in reality a combination of push and pull conditions. Giving the example of hunger, it was observed that in part, it may be signaled by internal changes in blood glucose or fat stores, but that motivation to eat is also heavily influenced by what foods are available.

Having seen what motivation is about, it is important to relate the term to creativity – "intrinsic task-focused motivation is… essential to creativity…people rarely do truly creative work in an area unless they really love what they are doing and focus on the work rather than the potential rewards", Sternberg, 2006. This conclusion that people rarely do truly creative work in an area unless they really love what they are doing, was, according to the author, based on research of Amabile (1983) and others. It is hereby observed that love for what people do amounts to intrinsic (internal) motivation, which in the context of Sternberg's statement is important to creativity.

In addition to motivation, other agents/conditions and resources necessary for creativity to thrive are:

Intellectual Skills	Environment
Knowledge	Confluence
Personality	

Three intellectual skills, which are particularly important for creativity, are identified by Sternberg, 2006. They are

a. the synthetic skill,
b. the analytic skill, and
c. the practical – contextual skill.

By the word "synthesize" (from which "synthetic" is derived) is meant "harmonize, arrange, blend, integrate… unify…to combine or to produce by synthesis", Merriam Websters' Dictionary and Thesaurus (Ultimate Reference Suite, 2008). Armed with this meaning, it is easy to see with Sternberg, (2006), that the synthetic skill enables one to see problems in new ways and to escape the bounds of conventional thinking- it is the position of this paper that relating different ideas which pertain to a problem can result in production of hybrid, creative, or new ideas or ways of seeing things.

The word analyze suggests separating or distinguishing the component parts of something (as a substance, a process, a situation) so as to discover its true nature or inner relationships, it involves "laying bare parts or pieces for individual scrutiny", (Merriam Webster's Dictionary and Thesaurus, Ultimate Reference Suite, 2008). The analytic skill, according to Sternberg, (2006), helps to recognize which of one's ideas are worth pursuing and which are not. Congruence an be observed between the dictionary definition of the word analyze and the statement by Sternberg, and this can be seen in the word "scrutiny" as a "process" so as to "discover" which of one's ideas are worth pursuing. The third of the three intellectual skills, that is, the practical - contextual skill is "to know how to persuade others of – to sell other people on – the value of one's ideas", Sternberg, 2006.

As an internal resource for creativity to thrive in an individual, and consequently, in a group, adequate KNOWLEDGE about a field is essential to move it (the field) forward through creative work. In the words of Sternberg, (2006), "one cannot move beyond where a field is if one does not know where it is".

With respect to PERSONALITY, it has been observed, with reference to research investigations summarized in Lubart, 1994, and Sternberg & Lubart, 1991, 1995, that personality attributes such as willingness to overcome obstacles, willingness to take sensible risks, willingness to tolerate ambiguity among others, are important for creative functioning. It is widely acknowledged that necessity is the mother of invention. If this statement is correct, it may as well follow that willingness to overcome obstacles is sine qua non to creative functioning, supposing that an obstacle creates necessity to the creative mind.

An ENVIRONMENT, which is supportive of positive creative ideas, is important. Although environment is external to the creative individual, it can affect his/her creative output by hindering it or otherwise. Hence Sternberg, (2006), observes, "one could have all of the internal resources needed to think creatively, but without some environmental support (such as forum for proposing those ideas), the creativity that a person has within him or her might never be displayed".

Developmental Accomplishment Profile in Visual Arts That Underpin the Role of Creativity

To accomplish, according to Merriam Webster's Dictionary & Thesaurus (Ultimate Reference Suite, 2008), is to "succeed in reaching …a stage in a progression". This implies development. At this juncture, this paper should present some accomplishments by person(s) who have made mark in history, through creativity, beginning with some accomplishments by a career visual artist.

In Visual Arts, individuals have made marks in Ceramics, Textiles, Painting, Sculpture, and Graphic Design – aspects of Visual Arts. Such individuals have thus achieved national and international renown. By so doing, they spurred development in their areas, for instance, by boosting tourism and educational/research activities. In contemporary times, one of such Nigerian artists is Bruce Onobrakpeya.

Bruce Onobrakpeya

Some of his accomplishments:

1. He developed a bronze lino technique in 1968 in which low relief linoleum is invested with a bronze coating resulting in a visual delight. In 1972, he evolved yet another technique, which he called "Plastocast" by casting plates for deep etching in plaster. He has been described by many international Art journals as the creative genius of Africa in the field of printmaking, Emu, 1992.

2. Bruce Onobrakpeya has exhibited his art works in Nigeria and abroad. According to Benson, 2007 (Guardian, September 28, 2007), Onobrakpeya had his first one-man exhibition in 1949 in Ughelli, Delta State of Nigeria. And that, he has since participated in several exhibitions around the world including the International Book Fair in Bologna in 1969; Howard University in Washington DC (1970); the Commonwealth Art Gallery in London (1971); Gallery Watata in Nairobi; FESTAC' 77, Lagos (1977); tenth one-man show at the Goethe Institute in Lagos (1978); SEVEN STORIES ABOUT Modern Art in Africa at the Whitechapel Art Gallery in London (1995-1996) to mention just a few. Some of his awards/accomplishments which are presented by Benson, 2007 include Pope John Paul II award for painting the life of Saint Paul, the Sadam Hussein award, the Solidra Circle award and Fulbright Exchange Scholar award. Furthermore, that he has been listed in International WHO IS WHO in Art and Antique.

Accomplished persons whose names are notable in contemporary Nigerian Visual Art scene are numerous and include Benjamin Enweonwu. On the foreign scene, one of the striking names is Pablo Picasso.

Prior to summing up of this discourse, this paper should reflect at least one perceived instance of creativity applied in science and technology. In a book titled, "You Can Be A World Changer – 101 Stories of People Who Made a Difference", some corporate authors (Cook Communications Ministries), observe, "in 1969, Armstrong was aboard Apollo 11 with astronauts Edwin 'Buzz' Aldrin Jr. and Michael Collins as it was launched at Canaveral, Florida. Three days later, the men found themselves in an orbit around the moon, 240,000 miles from the earth". Perhaps, it would not

have been possible for Apollo 11 to have taken a direct flight to the Earth's moon surface, from the Earth. This supposition is based on The fact that more fuel that would have been required by the rocket might have made flight more difficult due to weight. This kind of divergent thinking is reflective of creativity. The afore mentioned corporate authors continue, "on July 20, 1969, Armstrong and Aldrin flew the landing craft *Eagle* away from Apollo 11 command module… Armstrong found a safe place for the lunar module to land…he brought the craft to land on rest on the moon's surface". This suggests that not every part of the rocket that left Earth eventually landed on the moon. "After several hours of preparation, Armstrong opened the *Eagle* door, climbed slowly down a ladder, and set foot on the moon. Millions around the world applauded". This great feat and evidence of development by mankind did not come on a platter of gold, but, through creativity observed in critical, divergent, and analytical thinking, and made manifest in inventions and accomplishments.

Conclusion

Creativity is central, but not limited to Visual Arts. This is an allusion to the role of creativity in Visual Arts. This role of creativity in Visual Arts is clearly expressed by an author who was earlier referred to in this discourse.

According to him, (Uzoagba, 2000), works of art have to be conceived in the mind of a man, or group of men, and then made communicable to other men by the creative skill of the designer working in some medium that can be perceived by the senses through the eye, ear and hand.

The nature of creativity has also been examined, highlighting some
Characteristics of creative people. Not left out are vital resources necessary for creativity to thrive. Finally, a few cases of the triumph of creativity for developmental accomplishments by individuals are presented in this paper.

Recommendations

It is recommended that more research work be conducted on creativity, as, it can be viewed in diverse ways.

Government should assist in the promotion of creativity-friendly environment.

Finally, it should be mentioned, that, knowledge gained on this subject of creativity be applied in every discipline to facilitate remarkable career and disciplinary progress and pep up personal and group/societal development.

References

Benson, I. (2007, September, 28). Highlife party for Onobrakpeya at 75. *The Guardian*, p36.

Emu, O. (2006). *Certificate Art*. Ibadan: University Press PLC.

Encyclopaedia Britannica Ultimate Reference Suite (2008). Chicago: Encyclopaedia Britannica.

Getlein, M. (2002). *Gilbert's Living with Art.* New York, USA: Mc Graw Hill Companies Inc.

Ibrahim, B. (2000). *Visual Arts made easy*. Lagos: Movic Publishing Company Ltd.

Longman Dictionary of Contemporary English (1995). Essex, England: Longman Group Ltd.

Merriam Webster's Dictionary & Thesaurus, Ultimate Reference Suite (2008). Chicago: Encyclopaedia Britannica.

Michael, W.P. & Ronald, E.S. (2004). *Psychology the Science of Mind and Behaviour*. New York, USA: Mc Graw Hill Companies Inc.

Oxford Advanced Learner's Dictionary (2006). (ed) Oxford: Oxford University Press.

Sternberg, R.J. (2006). *The nature of creativity*. Medford, USA: Lawrence Erlbaum Associates Inc.

Uzoagba, I.N. (2000). *Understanding art in general education*. Onitsha: Africana FEP Publishers Ltd.

THE INFLUENCE OF SOCIO-CULTURAL FACTORS ON FEMALE LOW PARTICIPATION IN COLLEGIATE SPORTS IN EBONYI STATE.

Dr. Michael O. Olumba

Abstract

Sports participation in higher institutions has become a requirement which is backed by policy Sports Development Policy, (SDP, 1989). Competitive, sports for women is also gradually increasing. The success of any sports policy depends on the level of participation of those it is meant for among other things. Omoruan (1996), lamenting female low participation in sports stated that various reasons account for the apologetic stand of females in sporting activities that have become man's world. He stated further that as a result of societal negative attitude, our universities and colleges have not lived up to the expectations either in producing female athletes or competent professionals. This paper therefore investigated the socio-cultural determinants of female low participation in collegiate sports in Ebonyi State. Conclusions and recommendations within the scope of the study were accordingly made.

Introduction

The area of physical education and sports like many others is saddled with traditions, taboos, and myths. In medicine or engineering for instance, such traditionally originated myths often disappear under close scrutiny of scientific analysis. In education as in any other social discipline, the primary area of interest, human behaviour does not lend itself easily to scientific analysis. According to Mshelia (1998), these fields are more conducive to the birth and growth of unchallenged ideas which after years of fermentations, suddenly appear as truths or principles.

The emergence of women in sports is largely a twentieth century phenomenon. Infact, women made their first appearance in the Olympics in the 1900 (Bucher& Krotee, 2002). Even when the Olympics were revived, women were not allowed to participate. The males have offered varied rationalizations for subordinating women and much of it has rested upon the dubious assumptions of women's inherent weakness.

The notion that women have been conditioned to be what they are is deeply rooted in the prejudicial social pattern of different cultures. Women through the ages have always been viewed to be made of milk and honey. Consequently, in keeping with this metaphor, a feminine picture of a woman was conjured up which seems to militate against females doing anything too physical. Adeyanju and Shuaibu (1992) observed that in Nigeria the female faces greater stress than her male counterparts because she is working against the expected traditional feminine role when she commits herself to serious athletic competitions. In fact in some parts of the country, women are forbidden to expose themselves beyond the knee and elbow. Such women find it difficult to take part in sports which would require them to wear shorts, skirts and sleeveless vests. The case of Sokoto State legislation is 1983 and Sharia legislation of 2000 in some parts of the North comes to mind.

Faluyi (1989), opined that the influence of cultural tradition on women can not be underestimated when analyzing the factors affecting women participation in sports. Most Nigerian sports women retire automatically from active sports when they get married in preparation for marital duties. When they start having children, they forget they ever took part in sports. Studies have shown that physically, becoming a mother is not any more detrimental to sports than becoming a father (Kaplan, 1979; Klarfs & Arnheim, 1981). So many women in developed countries have become impressive athletes that doctors call pregnancy a nine months conditioning programme (Kraus & Curtis, 2006).

In Nigeria, our women are trying to emulate their female counterparts in developed countries as few women no longer withdraw from competitive sports. Bold as these steps may seem, Kabido and Dashe (1982) opined that the liberation of Nigerian women in sports is still greatly handicapped by the fact that men dictate the behaviour of women. A woman's identity according to Mshelia (1998), from historical times has been tied to that of her husband, family and significant others hence for a woman to be involved and continue active participation in sports, she must be located in a social

environment highly supportive of her activities.

Statement of the Problem

Ebonyi State is endowed with four institutions of higher learning, two Federal and two State owned. With this availability of a viable breeding ground for seasoned female athletes, one wonders why the state cannot " manufacture" her crop of female athletes from her institutions.

The purpose of this study was to find out the influence of cultural and social considerations on female low participation in collegiate sports.

Hypotheses

The following hypotheses guided the study and were tested accordingly:

Hypothesis 1: Marital status will not be a significant determinant of female low participation in collegiate sports in Ebonyi State.

Hypothesis 2: Cultural influence will not be a significant determinant of female low participation in collegiate sports in Ebonyi State.

Methodology

Research Design

The design of the study was the descriptive survey research. The utilization of the design was hinged on the fact that it is suitable for gathering data from a relatively large number of cases at a particular time.

Population

The population for the study comprises all the female students of the four higher institutions in Ebonyi State.

Sample and Sampling Technique

The sample was made up of a total of six hundred students. After stratifying the various faculties/schools in the institutions, the simple random sampling technique was utilized to select one hundred and fifty (150) samples from each of the institutions.

Research Instrument

The research instrument was the researcher-designed Likert type questionnaire with four points rating scales of strongly agree, agree, disagree and strongly disagree. The instrument has a reliability index of 0.99 and was self administered in the various institutions.

Data Analyses and Discussion.

The analysis of the data was done with the chi-square inferential statistics at 0.05 level of significance.

Hypothesis 1

Marital status will not be a significant determinant of female low participation in Collegiate Sports in Ebonyi State.

Table 1: Response on Marital Status and Sports Participation

Responses	Frequency	Percentage	Df	Critical value	Calculated value
Strongly Agree	129	21.5	3	7.82	53.38
Agree	224	37			
Disagree	142	24			
Strongly Disagree	105	17.5			
Total	600	100			

$X^2 = 53.38$, df = 3, $P < 0.05$, Table value = 7.82

Data in Table 1 shows that the critical or table value of X^2 at 0.05 alpha level is 7.82 while the calculated value is 53.38. Since the calculated value is greater than the critical value, the null hypothesis was therefore rejected. This means that martial status is significant in female participation in sports.

Hypothesis 2

Cultural influence will not be a significant determinant of female low participation in collegiate sports in Ebonyi State.

Table 2: Response on Cultural influence and Sports Participation

Responses	Frequency	Percentage	Df	Critical value	Calculated value
Strongly Agree	126	22	3	7.82	80.01
Agree	182	30			
Disagree	218	36			
Strongly Disagree	74	12			
Total	600	100			

$X^2 = 80.01$, df = 3, $P < 0.05$, Table value = 7.82

In table 2, the X^2 computed shows that the critical or table value is 7.82 while the calculated value is 80.01 at 0.05 alpha level at 3 degree of freedom. In view of the fact that the calculated value is greater than the critical value, the null hypothesis was rejected. This means that cultural influence is significant in female sports participation.

Discussion

A look at the data in the tables shows that the frequencies of response in Table 1 reveals that three hundred and fifty-three (353) respondents which represents 58.5% of the sample agreed with the statement. Two hundred and forty-seven (247) respondents which represent 41.5% of the sample disagreed with the statement. Demographic data shows that four hundred and forty (440) respondents were within the 21-25age bracket, and five hundred and fifty –seven (557) are single. This means that majority of those who accepted the statement that marital status or marriage cannot prevent them from taking part in sports are not even married.

Based on the findings above, the hypothesis that marital status will not be a significant determinant of female low participation in collegiate sports was rejected. This means that the influence of the husband, family and significant others in determining to what extent a woman can participate in sports cannot be over-emphasized. This finding is in agreement with the conclusion of Mshelia (1998) that for a woman to be involved and continue active participation in sports, she must be located in a social environment highly supportive of her activities.

Responses as indicated in table 2 show that three hundred and eight respondents which represent 52% of the sample agreed with the statement that they will not take part in sports if their culture disapproves of it. Two hundred and ninety-two (292) respondents which represent 48% of the sample disagreed with the statement. From the responses of the respondents, it is evident that 52% of the sample will abstain from sports participation because of cultural disapproval. This shows that cultural influence on female participation in sports is a significant negative factor.

On the basis of this finding, the hypothesis that cultural influence will not be a significant determinant of female low participation in collegiate sports in Ebonyi State was rejected. This influence stems from the fact that our society is such that attaches much premium on taboos and superstitions, which greatly dictate the behaviour of people particularly women as opined by Faluyi (1989).

The finding is also in agreement with those of Adedeji (1991), Adeyanju and Shuaibu (1992), and Mshelia (1998), that socio-cultural patterns of men determining the role of women and placing limitations on them especially in Ebonyi State has militated against their effective participation in collegiate sports.

Findings

On the basis of the data in tables 1 and 2, the study found that:

1. the influence of husband, family members and significant others is a significant determinant of female low participation in collegiate sports in Ebonyi State.
2. cultural influence is a significant determinant of female low participation in collegiate sports also in Ebonyi State.

Conclusion and Recommendations

In view of the findings of this study, the following conclusions were drawn, social factors as well as cultural influence are significant determinants of female low participation in collegiate sports in Ebonyi State. This is because the society has created many myths and folktales which reinforce the rejection of sports for most women.

In order to reverse this ugly trend, there is need for an aggressive campaign in the form of orientation to enable female students exploit the physical, social and cognitive benefits of sports participation. Sports participation should be made a requirement for graduation. The implementation of lecture-free day for sports must be enforced to enable female students derive maximum benefits from the sports development policy.

References

Adedeji, J.A. (1991). *African women in sports participation.* A paper

Adeyanju, F.B. & Shuaibu, B.E. (1992). Psychological, stress and the

Bucher, C.A. & Krotee, M.L. (2002). *Management of Physical Education and Sports.* (12th ed.) St. Louis: McGraw Hill.

Coakley, J. (2004). *Sports in society: Issues and Controversies*. (8thed.). St Louis: McGraw Hill.

Faluyi, O.O. (1989). Socio-cultural changes and female participation

Federal Republic of Nigeria. (1989) *Sports Development Policy for*

Kabido, A.I. & Dashe, V. (1992). Cultural Implications of women Participation in competitive sports in Nigeria. *Multidimensional*

Kaplan, J. (1979). *Women and sport.* New York: Avon Books/Victory Press.

Klarfs, C.E. & Arnheim, D. (1981). *Modern Principles of Athletic Training* (5th ed). St Louis: C.V. Mosby and Co.

Kraus, R.G. & Curtis, J.E. (2006). *Creative management in* Mshelia, B.S. (1998). *Women Participation in Sports: Myths and*

Omoruan, J.C. (1996). *A handbook of Physical Education, Sports And Recreation.* Zaria: S. Asekome & Co.

Whannel, G. (2005). *Media Sport Stars: Masculinities and Moralities*. London/New York: Rutledge

ASSESSING THE READABILITY OF TEXTBOOKS FOR COMPUTER STUDIES AS PROPOSED BY THE DELTA STATE EDUCATIONAL BOARD

A.A. Ojugo and A. Osika

Abstract

This study is designed to ascertain the readability levels of some textbooks used in the teaching of computer studies in primary and post primary schools in Delta State, Nigeria. X-raying the challenges of constructivism as applied to STM requires urgent intervention on the curricular and instructional material of our educational system, as we may have nothing to offer students in the 21st century – drawing us into technological isolation. We must thus, uphold *internationalization* by devising appropriate strategies against *deterritorializing* knowledge with constructivism, which in turn will help to redefine our educational goals to meet globalization as a means of networking and unification. Constructivism gives a description of individual, group and organizational adoption patterns of technology for teaching and learning across disciplines at the various schools and educational levels. It will help images exemplary practices for teaching, learning and research as well as highlights evidences linking technology integration, readability and quality students learning.

Introduction

Within a few years after the Europeans arrived and made their first contact in Nigeria, they introduced formal education into Nigeria. One of the first three subjects introduced were arithmetic at the primary level and the first three arithmetic texts used to aid the teaching of this subject includes *Efficiency*, *Shillings* and *Larcombe's* arithmetic. These were written by British authors, some of who had never been to Nigeria, not to talk of having a good knowledge of the Nigerian culture. Thus, most topics represented in such textbooks (having no prior knowledge of our cultural background) become unrealistic in the Nigerian context. This is because we require the known to learn about the unknown.

Constructivism is the concept that a learner constructs meaning for himself as he learns. Hence, individually and socially, he constructs meanings and knowledge as he learns. Though taught by a teacher, they learn the same concept independently and by their cognitive abilities, construct their *own* independent, fundamental understanding, irrespective of what *meaning* the teacher attributes to the concept. Bloom (1956) notes educational goals as a function of the *cognitive*, *affective* and *psychomotor* domain respectively and Phillips (1995) notes three distinct roles of learners' constructivism as:

(a) *Active* learner in which knowledge and understanding are actively acquired
(b) *Social* learner in which knowledge and understanding are socially constructed
(c) *Creative* learner in which knowledge and understanding are created or recreated

The learner possesses an *active* role accompanied by social or creative roles, which result from learner's motivated search for knowledge. Teachers in the course of sharing ideas must interact with the learner using an *established* language format. This helps to further enhance understanding and thus justifies the educational system. One is thus justified to say that these textbooks formerly used depict foreign cultures used in the Nigerian environment (a problem in the teaching of most subjects today).

One cannot talk about computer science as a field of study without emphasis to mathematics. Recently, the Delta State government and its education board launched the integration of computer studies at the primary and secondary school levels, which is to be implemented in phases. To ensure success, knowing the place of computer literacy in today's society, they employed *few* experts and *many* non-experts to help with the adoption and adaptation of suitable textbooks that will aid the effective teaching and learning of computer. This arose with the need and challenges placed on the society by the information age in order to equip today's student with the information, ever-growing societal changes.

Principles of the Constructivist Learning Model

The following are principles of constructivist thinking that every learner keeps in mind:

1. Learning is an *active* process, consisting of both meaning construction as well as constructing the system for these meanings.
2. Knowledge construction is *mental* – since it happens in the mind of the learner.
3. *Language* influences a great deal what we learn – because learning is a social activity associated with connections the learner makes with others.
4. Learning is *contextual* – since the learner cannot learn isolated facts or theories in abstract ethereal land, separate from real world situations.
5. *Motivation* is a key in learning, because we need to know the way in which this knowledge being acquired can be used.
6. *Knowledge* is important to learning. We cannot comprehend new ideas without having some structure developed from previous knowledge to build on.
7. Learning is not *instantaneous* as it takes time for concepts to be assimilated.

Jonassen (1991) notes that constructivism proposes an educational environment that supports multiple interpretations or perspectives to reality, knowledge construction as well as a context-rich and experience-based activity. Hence, it will focus on knowledge *construction* rather than knowledge *reproduction* as students construct knowledge from experiences, mental structures and beliefs used to interpret objects and events, which cannot be done outside the mind. The constructivist model has tasks that uses real world relevance and is integrated across curriculum that provide the appropriate level of difficulty or learner involvement. It is rather impossible for a learner to become masters of all content areas.

This goes on a long way to stress the fact that instruction is anchored in some meaning, real, world context. The ideas and interest of the leaner drives his capability in the entire learning process, because teachers are flexible in that sometimes they are knowledge giver and other times, facilitators (Strommen and Lincoln, 1992). Holden (1994) notes that *learning* is a *constant* parameter and time, the variable in such a setting. Dwyer (1991) notes that constructivist setting is learner centered rather than curriculum centered – since it is a dynamic learning process.

These principles comprise of socially mediated activities that are divided into acquisition and participation metaphors of learning. Hence, constructivism in all totality stresses an environment of learning in which knowledge is generated based on the learner's ability to construct knowledge from his environment. Dougiamas (1998) notes the four dimensions as thus: *trivial*, *radical*, *social* and *cultural* constructivism.

Intertwining Challenges for Readability and Constructivist Model

Though STM has gained recognition, it is yet to get out of the shackles. Overcoming the challenges of STM requires producing systems of international caliber that will help put African trajectories in perspective by comparing them with other experiences in the rest of the world. With the unified objective of STM as above and considering the present influence of constructivism in our educational system, challenges to be addressed are:

a. **Nativism:** Cultural constructivism projects racism. This distorts the fundamental unity in science because cultural constructivism represents knowledge as meanings that allow a user to convey an idea in different languages. Thus, conveys different meanings even when referring to same objective state – insofar the grammatical structures of the spoken language differs. It also believes that meaning is connected with linguistics, while *applied* science believes meaning as objective states of nature that transcends linguistic boundaries. Going by cultural constructivism, every spoken language must construct its own periodic table for atoms, molecule configurations and recreate nature to suit their cultural and linguistic boundaries. The nativism of cultural constructivism and empiricism of applied sciences are too *parallel* and hence, may never meet at the tabernacle of internationalization and globalization.

b. **Poor interpretation of globalization:** Poor globalization in scientific enterprises is often misconstrued not as co-construction of knowledge but as nativism. The global network ensures unification of science via interaction and exchange of concepts and ideas, innovations and skills amongst experts with organization scattered all over the world. It does not urge individuals

and research units to be localized and restricted by culture. Competition should be encouraged and circulation of intelligence should become the rule. Current cultural constructivism in science education programme is faced with the big challenge of capacity building, establishment of research networks and dialogues with various Africans in diasporas and with other worlds.

c. **Territorialism:** The false belief that only autochthonous people are physically living in Africa can produce within a closed circle limited to themselves, a legitimate scientific discourse on the realities of the continent (Abonyi, 2005). This forces the issue of territorialism of knowledge to the fore – making it a criminal assumption of cultural constructivism to think that generation of knowledge does not transcend cultural boundaries. Ideas formed from different cultural perspectives should not be encouraged – due to gradual predominance of idea similarities over their differences. These similarities alone by virtue of their many appearances, imprints themselves upon the mind, while individual differences that changes from case to case, fail to attain the like fixity and performance. Early inventors such as Faraday, Newton and Edison to mention a few, transcended ethnic boundaries. Faraday discovered the electricity, which was further worked on by Richardson and Edison. This same electricity known to them is the same known to us today, here in Nigeria – to show that their theories transcended ethnic boundary. Today's educational curriculum and instructional material are being *territorialized*, designed like the STAN series, IRDI amongst other journal/publication, conferences around themes such as "You and your environment". The question is how territorialism in STM meets the challenges of internationalization and globalization in Nigeria in the 21st century.

Scope of the Study

The study is designed to help ascertain the readability of textbooks used in the teaching and learning of computer studies (as proposed) in Delta State senior secondary school level at the various levels. The textbooks are "Computer studies for secondary schools I, II and III" as written by Aghware F.O (College of Agbor), Okonta E.O (Federal College of Education Technical, Asaba) and Ojugo A.A (College of Physical Education, Mosogar)

Research Questions

The study will answer the following questions namely:

a. To what extent are these proposed textbooks readable at the classes for which they are proposed for approval in?
b. Are the textbooks as proposed by Delta state educational board more readable than standard textbooks already in use/adopted by teachers in private owned schools?

Methods

The computer studies textbooks selected under study are proposed for approval by the Delta state education board for use in senior secondary I, II and III. Questionnaires were distributed to ascertain the readability of these proposed textbooks as against the standard textbooks used by the private owned schools. A total of 100 qualified computer science teachers were selected based on stratified sampling from the various schools (government and private owned). This will help buttress the answers collected from the various respondents - to avoid falsehood of results collected.

Readability is the ease in which a student reads a textbook and understands. This can be determined by legibility of letters/words, vocabulary in terms of wordlenght and word frequency, sentence structure, number of syllabus etc. For this study, Flesch's readability evaluation model for textbooks was adopted – it involves drawing up 100-words passages at 10-pages interval from each of these textbooks and using the formular *RS* denoted below to calculate the mean readability score for each of these textbooks as thus: RS = (206.835 – SYL) * 0.846 - (100/SEN) * 1.015

SYL – stands for the number of syllabus contained in the 100-words drawn from the 10-page interval; while ***SEN*** – stands for the number of sentences. Wahome (1979) and Okpala (1992) interpreted these readability scores for each textbook under study based on Flesch's readability score, relative to the Nigeria as thus using table 1 below.

Table 1 shows Flesch's Interpretation of Readability Data Relative to Nigerian School (source: Abacus volume 22 No.1 September 1992, Pg 69)

Classes	80 – 89	70 –79	60 – 69	50 – 59	40 – 49	30 – 39	20 – 29	10 – 19
SSS 1	FE	STD	FD	D	VD	EVD		
SSS 2		FE	STD	FD	D	VD	EVD	
SSS 3			FE	STD	FD	D	VD	EVD

The keys are FE (Fairly Easy), STD (Standard), D (Difficult), VD (Very Difficult) and EVD (Extremely Very Difficult) respectively.

Research Question 1: To what extent are these textbooks readable at the classes for which they are proposed for approval in?

This is seen in tables 2 and 3 respectively using the data collected and analyzing them using simple percentage formular. The keys for tables 2 and 3 are VG (very good), G (good), A (appropriate), P (poor) and VP (very poor) for the classes under study.

Table 2 shows C.S French's Evaluation in Percentage

Items Stated	VG	G	A	P	VP
Legibility of words			66		
Organization of thoughts		88			
Layout, Design and Illustration with Photos		65			
Understandability And Clarity			68		
Examples & Exercises			90		
Explanation Of Difficult Concepts			88		
Application To Real Life situations		68			
How Current is Text Coverage					90

Results show that 66% of respondents agree that the legibility of word employed by C.S French is appropriate for the classes under study; while, 88% agree that concepts and thoughts as organized by C.S French is good. 65% agrees that the layout, design and illustrations of photographs used by C.S French is good; while 68% agrees that the textbooks is quite understandable and denotes clarity for the classes under study. 90% agrees that the examples and exercises used in the text is simply appropriate. 88% agrees that their explanations of difficult concepts are appropriate. 68% agrees that the textbook's application to real life concept and situation is good; while 90% agrees that the textbook does not contain enough current issues for the classes under study.

Table 3 shows proposed textbooks' Evaluation in Percentage

Items Stated	VG	G	A	P	VP
Legibility of words	90				
Organization of thoughts			88		
Layout, Design and Illustration with Photos		65			
Understandability And Clarity			68		
Examples, Problems & Exercises				80	
Explanation Of Difficult Concepts				58	
Application To Real Life situations			64		
How Current is Text Coverage		59			

Results show that 90% of respondents agree that the legibility of word used by native authors are very good for the classes under study; while, 88% agree that concepts and thoughts as organized is appropriate. 65% agrees that the layout, design and illustrations of photographs used by the same textbook is good; while 68% agrees that the textbooks is good and quite understandable and denotes clarity for the classes under study. 80% agrees that the examples and exercises used in the text is poor and inappropriate. This may be due to the fact that the author reads from various sources and

makes references to their examples. 58% agrees that its explanation of difficult concepts is also poor. 64% agrees that the textbook's application to real life concept and situation is appropriate; while 59% agrees that the textbook contains current issues for the classes under study.

Research Question 2: Are the textbooks proposed by Delta state educational board more readable than standard textbooks already in use and adopted by teachers in the privately, owned schools.

Table 4 shows the readability score for each of textbook under study

	Items / Classes	**SSS1**	**SSS2**	**SSS3**
Control Variable	C.S French series "Intro to computer"	71.23 STD	78.42 STD	88.65 FE
Experimental Variable	Introduction to computer for secondary schools by Okonta, O.E, Aghware F.O and Ojugo, A.A	48.99 D	68.12 STD	23.33 VD

Table 4 provides readability levels for each textbook using Flesch's model for textbook evaluation. Table 1 observes Flesch's interpretation of the readability scores (RS) used in the Nigerian context to show that the higher the RS of a textbook, the lower the number of pupils for which the textbook is standard; and the lower the RS, the higher the class level for which the textbook is standard. A close look at Flesch's model for the proposed textbook against those used in private owned school, showed that C.S French is good or standard for SS1 and SS2 respectively; while it was very easy for those in SS3. It was observed that Okonta's text was standard only for SS2; but difficult and very difficult for SS1 and SS3 respectively. Teachers noted that indigenous authors copy verbatim foreign idea without explaining in their own ideas. This adds no finesse to their work as other scholars can easily point out which work was copied.

Summary and Findings

A constructivist (technology-rich) class meets five goals: independent, individualized, interactive, intuitive and interdisciplinary. This must be complemented with the existing classroom teaching to provide teachers with active participation with their students for meaningful learning. Non-governmental societies should explore avenues for short-term courses in various subject areas (especially science and technology) at all levels.

Conclusion

The challenges placed by constructivism on our curricular and instructional material as used by our current educational system requires immediate attention or we may have nothing to offer students in the 21st century in terms of scientific development. This will draw us into technological isolation. It also images exemplary practices for teaching, learning and research as well as highlights evidences linking technology integration, readability and quality students learning.

Recommendations

Appropriate assessment in a constructivist-model should be evaluated due to the nature of the teaching/learning output that emanates from its environment. With constructivism a valid perspective for delivering knowledge (as studies have shown), it provides a valid set of criteria for evaluating the outcomes instruction – using these nine points for appropriate assessment in such a constructivist setting is as thus:

1. Technology forces constructivism and used to facilitate communication with parents
2. Assessment will be *outcome* and *context* based as well as *student* centered
3. A grading system must be developed which provides meaningful feedbacks because grades must be contracted where required
4. Assessment technique must be developed which reflects instruction outcomes
5. There must be non-graded options and portfolio assessment
6. There must also be self, peer and teacher's assessment
7. Performance standard must be developed
8. Students are videotaped as they work. This is a part of their portfolio

9. Focus of the learning must be on originality, which is important to evaluating how the learner goes about constructing his/her own knowledge rather than the products

References

Abonyi, O., (2005): *Cultural constructivism and science education: challenges of the 21st century in Nigeria.* NERDC publication 172 – 183.

Bandura, A. (1990). *Foundations of behaviour modification.* NY: Reinhart and Winston.

Cassierer, E. (1954): *Structure and functions in Einstein theory of relativity*. NY: Dover publications,.

Dougiamas, M (1998): *A journey into constructivism*. NY: Technical paper,

Mbembe, A (1999): Getting out of the ghetto: challenges of internationalization, *CODESRIA Bulletin* 2 & 3, 3 – 4.

Ojugo, A.A, Aghware, F.O & Eboka, A., (2006): Assessing the cognitive behaviour and performance of senior secondary school II mathematics student in Oshimili North local government area of Delta-state, published by the international research and development institute, Vol. 7, pg 1 – 6.

Ojugo, A.A, Aghware, F.O & Abala-Odibo, R.O., (2006): Assessing the cognitive behaviour and performance of senior secondary school II mathematics student in Oshimili North local government area of Delta-state, published by the international research and development institute, Vol. 7, pg 1 – 6.

Strommen, R.H., & Lincoln, G.A., (1992): The role of constructivism in the changing state of education, application at Montgomery school for children. *Educational technology*, 32, 12 – 18.

Urevbu, A.O., (1983): The objectives of science teaching and contemporary science curricular in Nigeria with reference to Bendel state primary science project. *Journal of science teachers' association of Nigeria.*

Vosniadou, E.O., (2004), Implementation of new education technologies, Princeton, NJ

FACTORS INFLUENCING THE PATTERN OF LAND USE ALLOCATION IN NIGERIA

O.F. Nwanekezie; A.N. Iroegbu and M. Alozie

Abstract

Town Planning Authority, Ministry of Lands, Works and Housing, Environmental Protection Agencies and Legislative Bodies respectively undertake regulatory measures that determine the uses of land. Government policies on development of land at Federal, State and LGA levels have some far reaching effects on pattern of land use in the society. Hence, this paper analyzed some of the factors influencing the pattern of land use allocation in Nigeria. Also discussed are the theories of urban structure. In conclusion, recommendations were made which include among others, the awareness of the identified factors – to understanding urban land – use allocation, as public sector planning, directly affects the land use development process and markets.

Introduction

Studies on the factors influencing the pattern of land use allocation, the location of towns, the manner of their growth, their morphology and the processes in the operation formation of patterns of distribution and uses have according to Oyebanji (2003) revealed that several kinds of influence are at work. However, professionals of different fields seem to deal with it differently. Litchfield (1969) stated that the sociologist is of the opinion that it is the human being and his psychology, which is the key to the process, his attitudes, interest, values, prejudice, likes and dislikes.

The geographer believes that man's activities are dominated by nature, putting emphasis on things like relief, elevation, climate and geology. On the other hand, the economist suggests that the main reason for putting any piece of land to use is the economies, which are to be obtained from using it, arising for example, from its accessibility to people and its situation in relation to other pieces of land. Other primary reasons for its becoming useful is also based on the quantum of benefits derivable from its location in relation to established uses and proposed or existing demands of transportation or communication.

All the above views are statements of facts, but it can be stated that human beings putting to use, particular site or parcels of land in particular way(s) and for different purpose(s) can not be explained completely from any of the above submissions.

Theories of Urban Structure

The land use process focuses on the conversion of individual parcel of land from rural to urban uses and on the role of public and private sector actors in that allocation. Cities found today are normally as the result of different growth patterns that have occurred in the past. The gradual emergence of a definite pattern of land use is the direct result of the interplay between the forces of accessibility and complementarily which later becomes complex as a city grows.

Three major theories of development can be used to explain the overall structures of cities. These three theories were developed over the twenty-five year period from 1920-1945 and each added to the knowledge of cities.

Over time, however, the concentric zones became sectors as transit and highways elongated land use patterns. Eventually, nuclei developed or were more formally identified as transportations to land uses. Hence, when evaluating the land use pattern of a large older city, which has undergone such changes, it maybe possible to find all three patterns. Rarely do contemporary cities illustrate entirely any one theory of land use (Nwanekezie, 2009).

Concentric Zone Theory

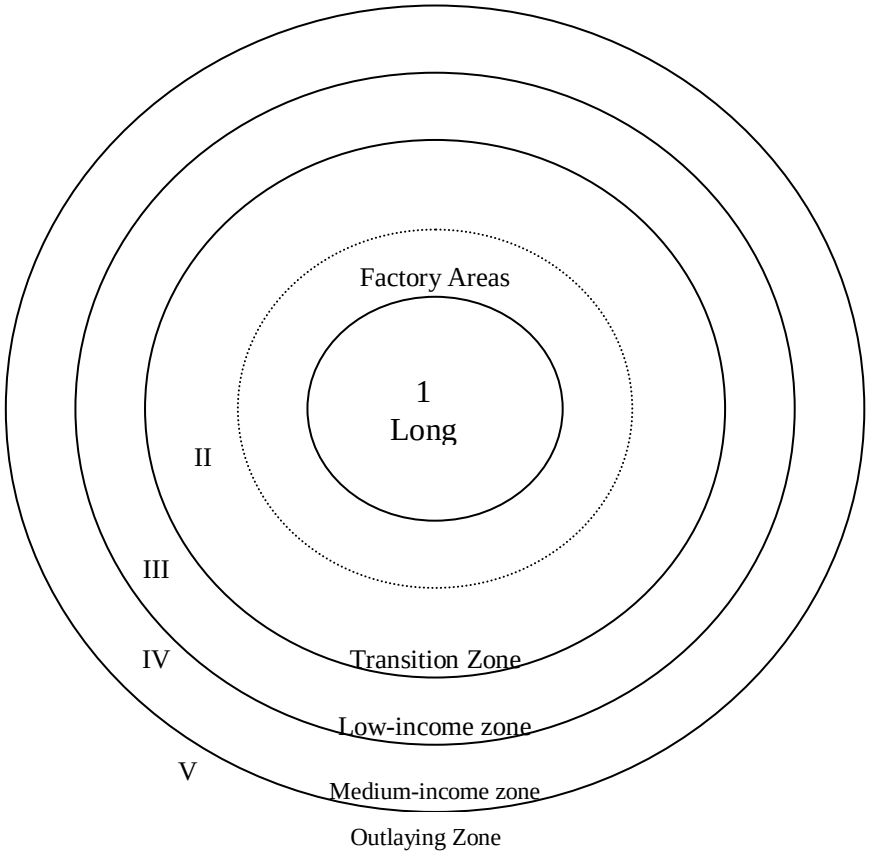
This theory according to Nwanekezie (2009) was developed by E.W. Burgess in 1925 from the study of the city of Chicago. Figure I below indicates the theory; burgess designated his central zone as the loop area. This zone is oriented around (100%) one hundred percent spot and includes the

stores, office buildings, and banks. It is the business centre of the city, the focal print of its commercial, social and civic life.

Other zones of the theory include a zone of transition which housing zone in the metropolitan area, containing older housing units; a middle income housing zone, frequently including some of the older suburbs, and the outlaying zone of newer sub - urban developments.

Figure I:

Burgess' Concentric Zones in Urban Land Uses



Given this pattern and a growth situation, each zone is held to invade the outer adjacent zone, with a rippling effect. With decline, the outer zone remains static while the transition zone enlarges into the central zone. Although this model is very simple, it does have a certain descriptive value. Its concept implies that growth takes place along the margin of successive zone.

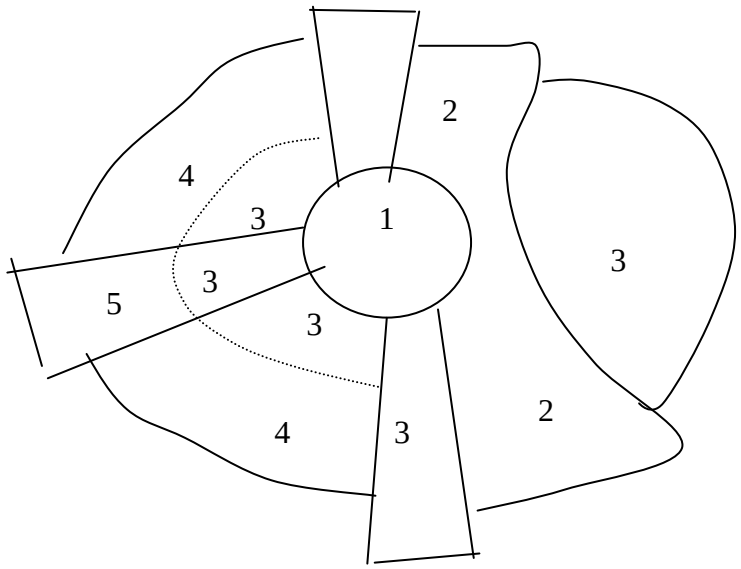
However, growth takes place along the radial lines. It thus disregards the effect of radial ways on land values and uses. The theory ignores the fact that physical barrier such as mountains swamps etc may be far more responsible for development pattern than zonal boundaries.

The Sector Theory

The theory according to Nwanekezie (2009) was proposed by Hormer Hoyt in 1939. It is an alternative to the concentric zone theory. It suggests that cities grow not in strict concentric zones, but rather in sectors of similar types of development. That is, residential areas might expand outward along existing transportation links, topographic features, natural amenities, or the like. The business-men who can afford high rent for their transactions are located at the centre, compatibles uses like manufacturing and ware housing and low income housing lay adjacent to each other, while incompatible uses repelled on another as in the case of high – income housing, manufacturing and warehousing. The theory is illustrated in figure 2 below.

Figure 2:

Radial Sector Theory



Sectors

1- CBD
2- Wholesaling and light manufacturing
3- Low-income housing
4- Middle income housing
5- High income housing

This theory provides a logical explanation for string-street development and for the tendency of commercial district to expand along important streets and to sometimes jump several blocks and then reappear along the same street. It assumes urban growth with succession in land uses in already developed area and in new developments around the fringe of the city.

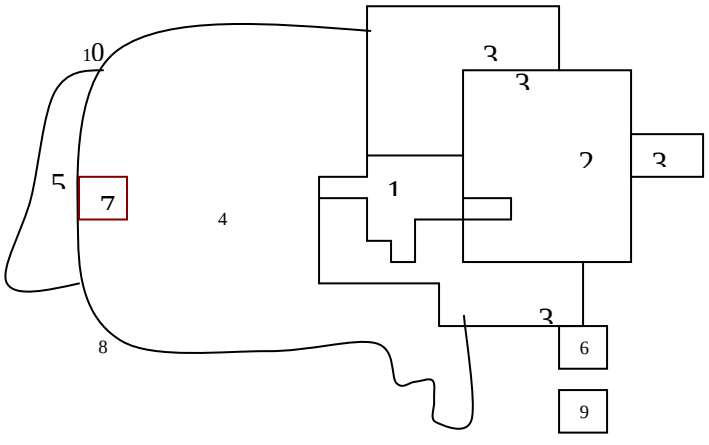
The land use patterns of many cities vary from the model suggested by this theory, and occasionally modification and adjustment again, are needed to make the theory fit the facts. Urban land factors not necessarily in two-dimensional cartographic generalization of the theory. The sector theory is also a product of a liassez faire society. However, most of the land sectors met found in our cities have evolved from an accumulation of individual decisions. Only occasionally have they resulted from deliberate city planning.

The Multiple Nuclei Theory

This theory was developed in 1945 by Chauncy Harris and Edward Unman, after initial explorations by R.O. Mckenzie (Nwanekezie, 2009). It varies from previous views in that, the downtown area is not considered to be the only focal point for growth. Land use patterns are seen to develop as a series of nuclei, each with a different function. Each centre develops from the spatial interdependence of certain functions for example, manufacturing and transportation uses may form one nucleus. Also, hotels, offices, and transshipment facilities may develop around an airport. The resulting model is readily discernible in the form of most cities. See figure 3 below.

Figure 3:

Multiple Nuclei Urban Structure



Uses

1. CBD
2. Wholesaling and light industry
3. Low income housing
4. Middle income housing
5. Upper income housing
6. Heavy industry
7. Outlaying business area
8. Residential suburb
9. Industrial suburb
10. Commuter zone

Such nuclei may have had different origins, existing as minor settlement before city growth began or developing where the growth of population and purchasing power supports a sub-urban shopping or business centre. Around the separate nuclei, distinctive types of land use have grown up over time and this existing pattern is strengthened by the general factors determining the allocation of land to specific uses. Thus high rents in the CBD induce firms to migrate or establish themselves in peripheral areas, while the various forms of special accessibility lead similar firms or household to concentrate in particular locations.

By given weight to such factors as topographic historical influences and above all, special accessibility resulting from economic and social forces, the multiple nuclei theory provides a more flexible approach to urban form than the earlier models based on transportation cost and accessibility to a single central core, but the latter notion can be incorporated into the model especially, in explaining the CBD and even suburden subcentres.

Factors Influencing the Pattern of Land Use Allocation in Nigeria

The factors influencing the pattern of land use according to Nwanekezie (2009) can be described within three framework as follows:

(1) The physical framework:- This involves the law of nature, which can be categorized under geographical influence, the use to which land in a particular locality may be put is highly influenced by the regular pattern, of weather conditions, like temperature, amount of rain and its regularity of winds and others. Whether a place is in the desert region, forest or temperate region is often put into consideration before deciding on what the land is suitable for.

Settlement pattern in the desert region differ considerably from that of temperate or forest region. The nature of soil is also put into consideration as in whether it is suitable for a particular use. For instance, solid firm land could be preferred to sandy, loamy or waterlogged area for residential use. With the development of modern technology, many things are achievable, but it is expensive and often not within the reach of everyone especially in the developing nations. Another element in the physical framework is the topography of the area. A hilly, rocky or undulating land area is not suitable for the construction of airport, industrial and commercial use.

(2) **The Institutional Framework:-** Customs, traditions, laws, organization and other institutions of human society are the practices that influence the use of land (Lichfield, 1969). These practices could be grouped into private individuals and public institutions. Private individuals practices include social behaviours, customs and religious belief. Religiously, there are sacred lands, which can not be used for any other purposes like residential, or commercial except for worshipping gods.

Also, certain uses that contradict the religious belief of some people in a particular community are forbidden. For example, in the Muslim dominated communities, beer parlours, cinema houses, hotels and rearing of pigs are not allowed. Under traditions and customs, some groups of people live together in large numbers while others constitute scattered communities. Some private individuals, group of people or family property owners also dictate what, how and when their land can be put to use. Public institutions include town planning activities, other regulatory bodies, laws etc.

Town Planning Authority, Ministry of Lands, Works and Housing, Environmental Protection Agencies and Legislative Bodies respectively undertake regulatory measures that determine the uses of land. Government policies on development of land at Federal, State and Local Government levels have some far reaching effects on pattern of land use in the society.

Those public institutions undertake necessary corrective, all preventive measures to counter the disastrous results of the activities of other forces in the usage of land. Apart from the zoning and other town planning regulations, there are, according to Nwanekezie (2009) three other key laws in Nigeria viz, the Land Use Act Cap 2020 LFN, the Environmental Impact Assessment (EIA), Decree 86 of 1992, and the Nigerian urban and Regional Planning Decree 88 of 1992. The principles and policies of the affected public institutions are enshrined in the laws as a way forward for better environmental management strategies.

Conclusion

The land use allocation, now usually part of a more comprehensive urban plan, remains as the primary planning vehicle for land use planning. Zoning Ordinances, subdivision regulations, and other rules provide the implementation component. However, studies have revealed that several kinds of influence are at work, with respect to the location of towns, the manner of their growth, their morphology and the processes involved in the generation formation of patterns of distribution of land uses.

Recommendations

Following the identified factors influencing the pattern of land use allocation in Nigeria, the following recommendations seem justifiable:

(1) Town Planning Authority, Ministry of Lands, Works and Housing should undertake regulatory measures to determine the uses of land.

(2) Environmental Protection Agencies and Legislative Bodies, respectively should also undertake regulatory measures-to determine also, the uses of land.

(3) Public Institutions should undertake necessary corrective all preventive measures to counter the disastrous results of the activities of other forces in the usage of land.

(4) Awareness of these factors is essential to understanding urban land-use allocation, as public sector planning, directly affects the land use development process and markets.

References

Lichfield, N. (1969). *Economics or planned development*. London: The Estate Gazette ltd.

Nwanekezie, O.F. (2009). Achieving urban equilibrium using efficient urban land-use allocation. *Unpublished Manuscript.* Abia State University, Uturu.

Oyebanji, A.O. (2003) *Principles of land use economics.* Lagos: Oyebanji & Co.

ROLE OF THE STAGE MANAGER IN EDUCATIONAL THEATRE

Monyeh Mitti Peter

Abstract

In Educational Theatre, majority of students usually opt for the post of Stage Manager. Many believe that it is the easiest job where one is not inconvenienced by anything like brain racking or otherwise. Based on this notion the student who gets the position of the Stage Manager in the course of time discovers to his chagrin what he never bargained for. Where the play is being directed by a lecturer - he is forced to start teaching the so-called stage manager his roles. This often leads to frustration for both the director and the stage manager who erroneously does not know the enormous function and responsibility of the stage manager. This paper therefore is meant to give insight into the functions of the stage manager and responsibilities, in the theatre as well as the functions and challenges of stage management.

Introduction

Management has always been applied in all ramifications of life-house management, school management, office management, farm management, educational management, and in traditional settings-traditional management and Theatre Management, etc. Though approaches may vary, from organization to organization any organization that wishes to attain success must take into account , effective and efficient management procedure. The success of any life endeavour rests on the management capability of the team. Management is thus a team work. The sum total of it all is that any group with a good management team is on the right pedestal to success. Management involves managing human beings as well as the other factors of production, infrastructures, money, land, labour etc.

The need for management has been recognized by all societies down the ages. As could be seen from history, the concept of management has existed since at least before the time of Plato. All societies – traditional societies inclusive have used and still use the principle of management though in varying form and degree. A work of this nature will be incomplete if we fail to take a Cursory look at the term management.

Management

Management could be defined as the process of planning, organizing, directing and controlling the activities of an enterprise to achieve its objective. Musselman et al 1977. see management as a process of getting things done through other people. According to Akani (1987:3);

> *Management is concerned with man's contact with fellow human beings and with his behaviour under a wide range of pressures and influences ... a professional discipline that assembles and uses resources to accomplish objectives.*

In the course of this study, we shall be concerned with stage management and the role of the stage manager in a production. Suffice it to say that the nature and role of stage management and the role of the stage manager do not make it very possible to arrive at a given definition of the term stage management. So many questions arise in trying to examine the term-as many writers, have made us believe. Is the stage manager the director off stage? Is he the house keeper, on stage, off stage and the general house? Also, to the ignorance what has management got to do with the theatre talk less of stage management.

In the natural world of ours, man produces either or both of two things – goods and services. Whereas some produce physical goods like buildings, bread, roads, cloths etc others produce services for instance-medical, legal, entertainment, etc. The practice of theatre falls under entertainment. In all, management involves the coordination and the use of man and other resources as we earlier stated. On this note, one would agree that theatre as human venture utilizes management principle like any other human endeavour or discipline especially.

Experience has shown that the work of all the different departments or crew in the theatre should grow with the process of a play performance-according to Derek Bowskill 1979 for proper coordination and good result from the day one-after the auditioning and casting.

According to Drucker (1982:6)

> *All institutions have in common the management function, the management task and the management work. All require management and in all management is the effective, the active organ. Management is the specific organ of the modern institutions. It is the organ on the performance of which the performance and the survival of the institution depend.*

The Stage Manager

In discussing the roles of the stage manager the challenges of stage management would be made manifest. But suffice it to state that a lot is apportioned to the position of the stage manager that one tends to see him as a super human creature. Indeed he has to be if success is the target of the team. He is said to be responsible to the artistic director, responsible for rehearsal when the director is not available, takes over the performance from the director after the dress and technical rehearsal and he is even responsible for the striking of the set after performance. He monitors what goes on stage and off stage during performance and even after the show and relates with the public through the press.

In any Theatre production the role of the stage manager falls under the followings headings:

(a) The stage manager's relationship with the director
(b) The stage manager's relationship with the actors both at rehearsals and out of rehearsals.
(c) The stage manager's relationship with the other crew members or other departments.
(d) The stage manager's relationship with people over whom he has no managerial controls-the public.

Relationship with the Director

For any production to attain a success there must be a good working relationship between the stage manager and the Artistic Director. The stage manager must all the time consult with the Artistic Director. He is accountable to the director throughout the period of preparation (rehearsals) to the technical performance night. He makes prior arrangement for rehearsal venues, making sure that the stage is set for rehearsal, before the arrival of the director, the cast and crew members. The general condition of the house during rehearsals is under his control. It is his responsibility to make available all the actors the director needs to work with. In this wise he must be accountable to the director of the where about of any actor at any point in time during rehearsals.

As the director plots his blockings, the stage manager takes down all the blockings in his rough note which he eventually transfers into his main notebook as soon as the blocking is perfected by the director (the director may change any blocking at any point). Usually all the directions should be noted in his short hand that is, in symbols with full note of what the signs stand for at the foot of the note or overleaf. The stage manager should be very vast in all stage craft-knowing all the stage positions e.g down stage left (DSL) Up stage right, (USR) or centre stage right (CSR) etc so as to record down the crossings by the actors as stipulated by the director, e.g Actor "A" crosses to centre right (CR) while actor "B" moves to take actor "A"s former position. When the director is not present, the stage manager handles the rehearsal, though he must not on any account block the part that has not been done by the director. On no account should he change what the director has done earlier. According to R.A. Adedokun 2001:6 where there is no Assistant Director, "it is the responsibility of the stage manager to assist the director in all aspects of his work as the director may instruct him".

Being responsible for rehearsal venue it is the stage manager's responsibility to arrive at the rehearsal venue to see that it is made suitable and ready for the day's job. At rehearsals the stage manager takes roll calls before rehearsal and after rehearsal so as to curtail absenteeism and indiscipline as some time some actors exhibit unruly behaviour. No member leaves the room without permission from the stage manager. The attendance register must be intact at every point in time. He keeps a register containing the names and these days of cell mobile phone, he keeps the phone numbers and addresses of the actors and the crew members. The stage manager must keep and

maintain a production file. Above all he must take note of how long each scene lasts, so as to get the appropriate timing of the play. As the rehearsal progresses, with the aid of the stop watch, he should be able to state the estimate of the time the play would take. He must also ensure that other crew members or departments keep their production files. Another important role-whereas each crew or department keeps accurate record of the responsibility under its jurisdiction, the stage manager must make sure this is carried out to the later. The stage manager must submit the whole files at the opening night to the department. i.e in the case of Educational Theatre.

Responsibility to the Actors

The stage manager is in charge of the general house and being responsible to the director, he must present the actors for rehearsals and productions. He therefore owes it as a duty of knowing the where about of each of the actors and the other crew members. The well-being of all the crews is in the hand of the stage manager.

He is in a position to deal with all problems that might affect any of the actors during the period they are working on the play. The nature of the stage manager's job makes it mandatory on him that he should be very humane in his approach at tackling the actors numerous problems. In other words the stage manager must have some element of psychology so as to be able to perform his duty and functions affectively. He must always have at the back of his mind the nature and fluidity of theatre environment as well as ever changing nature of man. He must understand that the success of any management strategy depends highly on the skill with which the manager is able to manage the human beings under his care. His knowledge of the complex nature of man is very crucial in his role. He must be quick and shrewed at handling issues. He must have insight of his job and understand that his success as a stage manager depends on how well he responds to the pressure of his job. The pressure of work must never weigh him down. As much as he understands the complexity and nature of man, in his approach to the actor's problems he must not sacrifice discipline on any ground. It is his duty to respond to the actor's problems as much as humanly possible and be fair to every person: the rule of the game being "fair is fair". He must see to it that the actors maintain their cues. To keep the situation at ease, calm and under control, he must print out the actors cues which should be placed at strategic positions where it would be readily seen by each person during rehearsals and performance. He must try and relate very well with each actor in their role playing (one on one relationship).

Relationship with the Other Members of the Crew

If there is proper definition of roles and the principle of division of labour is applied to the later, the work of the stage manager would (in his relationship with the members of the crew) be made lighter. This is essential so he (stage manager) could deal directly with the leader of each crew rather than every member of the team. The stage manager makes sure that all the elements of stage management – set, lighting, properties, costume, music and sound, blockings, etc grow with the production from the first rehearsal. The stage manager must know the script thoroughly so as to be helpful to the actors and the crew. The sketches and models needed for the production must be available to all from the onset of the production. There is this problem often created in the theatre that is waiting for the last minute action which often throws people into pressure and panic. If ideas and all factors are made ready early enough as the job progresses every member of the crew would work with, and at ease. It thus becomes imperative that things be done at the proper time. This will aid and prompt the actors/ actresses to master their role, while the crew also master theirs. The need for the provision of proper costume, set, lighting, music, sound, prompt cue for all, that is actors and crew would aid the interpretation of the play. This would in turn translate into rich reward for the groups' out-put: a rich theatrical whole.

Often we run into problems because of our inability to delineate the role of each member of the crew and the director. We make the mistake of thinking that it is the director who should be backing orders to everyone during rehearsals. If the stage manager knows his job for instance a situation where the director gives permission to the different crew or cast during rehearsal would be minimized as it distracts the director from concentrating on his job.

To achieve the objective of the theatre organization while creating opportunities for all the crew and actors, the stage manager and his crew need the spirit of team work. There must be a-give-and-take posture in its highest level. The marriage between the crew, set, property, stage,

lighting, costume, house management, publicity and public relations aspect must be maintained and protected by the stage manager.

Relationship with the Public

He owes the public a nice and satisfying performance. He therefore must ensure that the responsibility of the group to the audience is maintained. In all, most of his responsibility to the public is through his publicity team though after performance he may have the opportunity to relate with the press on interview. Even during and after performance he ensures the security and properties of his audience and maintenance of order during performance.

Even though the artistic possibility and opportunities are created by the director, in essence it is the stage manager who creates the practical condition for the realization and achievement of the goals of the director. According to Bowskill (1995:295).

> *The Director may device artistic possibilities and opportunities but he will get nowhere without a stage manager who can efficiently create the practical conditions for their realization.*

Conclusion

Foresightness, shrewdress and astituteness being essential ingredients in management, the stage manager must possess all these qualities. His judicious handling of the issues that affect his duties would to a large extent depend on his thorough training in human management as well as his mastering of the art of the theatre. He must know the enormous responsibility attached to his job. He must play fair in his job.

Above all he must be physically fit and alert to be able to perform his job. Efficiency and effectiveness must be his watch word.

Recommendation

Bearing in mind the enormous duty of the stage manager auditioning for the role is very important. In short his auditioning should be more rigorous than that of the cast. In addition apart from taking the course (theatre management is only done in year one) students of theatre arts should be subjected to take elective courses in business management department so as to be grounded in management.

The topic in theatre management should have such subheadings as theatre management, stage management, business management, etc.

References

Adedokun R. A (2001) *Theatre Production Handbook Guide to Selecting and Producing Plays* Ibadan. Stirling-Horden Pubs. (Nig). Ltd.

Akani, J.A. (1987) *Management concepts, techniques and cases* Nigeria: Jalab Pubs Ltd.

Bowskill, D. (1975). *Acting and Stage Craft Made Simple*. London: W.H. Alben & Co Ltd.

Ibid

Drucker P.F. (1982). *Management. tasks, responsibilities, practices* London: Heinemann.

Vernon, A. M. & Eugene, H. H. (1997). *Introduction to modern business.* Englewood Cliffs, New Jessey. Prentice-Hall Inc.

THE STANDARDS ORGANISATION OF NIGERIA (SON) AND THE PROTECTION OF THE CONSUMER IN NIGERIA.

Dr. Nkiru J. Obumneme-Okafor

Abstract

The Standard Organisation of Nigeria (SON) is the body charged with the maintenance of standard of products consumables in the country whether locally manufactured or imported into the country. The aim here is to inquire into the establishment, constitution and functions of the organisation as provided in the SON Act to examine how it operates to ensure that the public consumes quality goods. The exercise will also look into the problems encountered by the organisation in the performance of its duties and suggest ways of surmounting or circumventing these obstacles to enable it function effectively.

Introduction

Standardization is synonymous with human life. Most human activities involve one form of standardization or another such that many a time, standards are applied unknowingly. For instance, a housewife who carefully selects her ingredients and determines the quantity of each of them may not know that she is applying a standard (Monye, 2003). The term standardization has been defined by the International Standards Organisation (ISO) as a process of formulating and applying rules for an orderly approach to a specific activity for the benefit and with the cooperation of all concerned and in particular, for the promotion of optimum overall economy taking due account of functional conditions and safety requirements. It also means a conscious effort of man to simplify things, reduce unwanted variety and create order (Pollit,1990). It has been described as a system of control of the method of production as well as product standards or composition with the aim of ensuring that only good quality and safe products are put in the market(Monye,2003). Synthesising the foregoing, standardization is the application of required rules in the process of production while maintaining the normal product standards to ensure that goods produced and placed in the market are of good quality and safe for consumption.

The body, in the country today charged with the responsibility of standardization of methods and products is the Standards Organization of Nigeria (SON). Currently the enabling legislation is the Standards Organization of Nigeria Act, Cap S9.(Laws of the Federation of Nigeria, 2004 SON ACT 2004). This work forays into the main aspects of this body because of its essence in the consumer protection arena.

Nature and Composition of the Organization

As the name depicts, the SON is set up to cater for and ensure that the goods produced and consumed in the country are of at least, the minimum required standard. The organization is a parastatal of the federal government and administered by the Ministry of Industries. It is a body corporate, having legal personality with all the incidents. It has two arms through which it operates – a Council which is the governing body of the organization called the Standards Council of Nigeria and the organization itself (Section 1(1 and 2) SON Act 2004). The Council sees to the running of the organization through the formulation of polices in accordance with the intent of the formation of the organization while the organization implements such polices.

The organization is made up of a Director-General (DG) of Standards, the Directors, Secretary and other support staff to help in the running of the organization (Section 1 (2) SON Act 2004). The Council, which is the policy making body of the organization is made up of a seventeen member panel with the chairman who shall be the Director- General of the Federal Ministry of Industry, the D.G Standards and a representative from each of these bodies and fields of activity – the Federal Ministry of Industries, Agriculture and Rural Development, Health, Defence, Commerce, Transport, Works and Housing, University Education and Research, Chambers of Commerce,

Industry and Mines, Engineering and Engineering Consultancy Services, Processing and Manufacturing Industry, Construction Industry, Employers Association, Consumers Association and one person who appears to the Minister to represent interests or fields of activity not already represented. However, the President reserves the right to increase, reduce or vary this composition of the Council (Section 1 (1-3) Schedule to the SON Act 2004).

Appointment and Term of Service

The Director – General shall be appointed by the President based on the recommendation of the Minister of Industries. The law provides that the appointment, remuneration and other conditions for other Directors and the support staff are determined or prescribed by the Council in consultation with the Federal Civil Service Commission (Section 1 (4 and 5) and 24 (1) SON Act 2004). This presupposes that the Council takes care of the their appointment. Apart from the Chairman and the D.G; the Minister appoints other members of the Council.

The members of the Council are to hold office for a period of four years from the date of their appointment or the instrument of such appointment. The appointment is renewable. Any member of the Council can resign his appointment, the notice of which shall be in writing, signed by the member and served on the Minister of Industries (Sections 2, 3 and 4 schedule to the SON Act 2004). Any member can be removed from office by the appointing authority that is the President for the D.G. and probably the Chairman but just as the Chairman of the Council because the person still retains his portfolio as the D.G. in the Federal Ministry of Industries from where he took up the position and others by the Minister. Again, the President has the overriding power in this issue of membership of the Council as he can increase or decrease the composition of the Council (Section 1 (1 and 3) and 3 Schedule to the SON Act 2004).

The other staff of the organization have their conditions of service under the control of the Council. This, it is given, also includes the tenure of their employment as the Act is mute on this. It is arguable that since the Council oversees these staff after consulting with the Federal Civil Service Commission, the conditions of service of Federal Public Servants apply to them as well and so, the mode of resignation and removal including pensionability of their appointments should also be as is obtainable under the federal public service.

Functions of the Council and the Organisation

The functions of the Council and the organization are numerous and diverse. The aim is to ensure that the product pushed into the market by producers are of the required quality and the process of production of the acceptable standard. These include *inter alia* to:

(a) Advise the Federal Government generally on the national policy on standards, standard specifications, quality control and metrology;
(b) Designate, establish and approve standards in metrology, materials, commodities, structures and processes for the certification of production in commerce and industry;
(c) Provide the necessary measures for quality control of raw materials and products in conformity with the standard specification;
(d) Organise tests and do every thing necessary to ensure compliance with approved standards;
(e) Undertake investigations as necessary into the quality of facilities, materials and products in Nigeria and establish a quality assurance system including:
(f) Certification of factories, products and laboratories, and ensure reference standards for calibration and verification of measures and measuring instruments (Sections 4 and 5, SON Act 2004).

In order to accomplish these lofty goals, the organization is empowered through the D.G. if he is not satisfied with the quality, purity or potency of any product because such a good is detrimental or hazardous to life and property, apply to a magistrate court within jurisdiction for an order of the court so as to seize, destroy or prohibit any person from selling any such product. It can seal up the premises where such product is stored or manufactured and can direct the producer/manufacturer to rectify the deficiency in the case of low product, if the deficiency is capable of correction. By the

written authority of the D. G., himself or any staff in that regard, has the right of access at all times, into any building or premises where an industrial or commercial undertaking is being carried on and the nature of the business required such a person to furnish the SON with any information. The court can make any order that a seized product which is in the court's opinion hazardous or injurious to life, be destroyed or disposed of in a manner sanctioned by the court. Where a product is seized the D. G shall direct where it should be kept. Such a product should be returned to the owner should the court refuse to order for its forfeiture or destruction (Sections 17 and 18 SON Act 2004).

The willful obstruction, interference with, assault or resistance of any officer of the organization in course of his lawful duty, or whoever aids, invites, induces or abets any other person to do so is guilty of an offence, and is liable on conviction to a fine of ₦200.00 or imprisonment for 3 months or both. The offence is the same where in furnishing returns where an information is required, a person knowingly or recklessly makes a statement in the return which is false (Section 19 (2 and 3) SON Act 2004).

Establishment of Industrial Standards and Certification Scheme.

By Sec. 4 (1) b of the Act, provision is made for the establishment of industrial standards known as Nigerian Industrial Standards (NIS). A Nigerian Industrial Standard has been described as a precise and authoritative document established by consensus and approved by the Standards Council of Nigeria, prescribing criteria to ensure that the material, product or procedure is fit for the purpose for which it is intended (SON in Brief : 2). The standards are formulated by technical committees set up by the Council constituted from experts representing various interests such as producers, consumers, technologists, research institutions and testing organizations both in the private and the public sectors (SON in Brief : 3). These experts inquire into all the relevant aspects of the matter before them. Through consensus opinion based on scientific and technical data, they evolve a standard and make a recommendation to the Council. If the Council is of the opinion that such a recommended standard is significant to the national economy, it establishes such a standard to be the standard required for the production of such a good or product and shall be known as the Nigeria Industrial Standards. Manufacturers whose products meet the required standard are permitted to affix a special certification mark showing that such an item is one of those falling under the Nigerian Industrial Standards (NIS) (Sections 12, 13 and 14 SON Act 2004, SON in Brief 14). This is called the Certification Mark or the "Nigerian Mark of Quality". The significance of this mark is to convey to the consumer an assurance that the goods bearing the mark have been tested and certified by the organization to have complied with the relevant NIS and that they may therefore be purchased with reasonable assurance of quality (SON in Brief : 3 – 4).

These standardization and certification of products are good. The certification mark on a good points to the quality, the good having been produced according to the required standard. The relationship of this with the purchaser of the petroleum product is misty and not clear as the customer is not in a position to know whether the product dispensed straight into his car or receptacle is of the right quality. One can only assume that the quality control measure is carried out at the refineries, depots, farm tanks and points or ports of entry of such imported products.

Practical Approach to the Realization of Objectives.

The SON, in the bid to ensure that goods are produced according to the established standards, conduct routine inspection of production lines in industries, conduct tests on sample goods taken from factories and the open market. Manufacturers in order to affix the NIS mark, can send the product to SON for laboratory analysis before they are licensed to use the certification mark on their products. The Council reviews the standard at intervals of at least every three years, 'though the 'SON in Brief' publication says yearly subject to continued good performance of the manufacturer and his willingness to continue with the scheme (SON in Brief : 4, Section 12 (4) SON Act 2004). In the face of the variance on the period for revision, the provision of the Act should prevail, the 'SON in Brief' being just a publication of the organization. The standard can be revoked by the Council and the whole process for establishing a standard is repeated to regain the standard (Section 12 (5) SON Act 2004).

To make sure that standard goods are consumed in Nigeria, the SON devised a conformity assessment programme for locally produced and imported goods. These are the MANCAP, that is

the Mandatory Conformity Assessment Programme put in place by SON to ensure that all the locally manufactured products conform to the relevant NIS before such products are presented for sale in the Nigerian market or exported (MANCAP in Brief: 1). The SON Conformity Assessment Programme (SONCAP) is a new policy evolved by the SON to check and control the importation of substandard and unsafe products into the country. This policy is a new import requirement which took effect from 1st December 2005. The programme is a set of conformity assessment and verification procedure applicable to certain regulated products imported into Nigeria. The compliance of such products is with the applicable NIS specification and other approved international standard prior to shipment (SONCAP in Brief:1). Where such goods meet the required standards a SONCAP certificate is issued and this is a mandatory custom clearance document without which such goods will be subjected to delays and possibly denial of entry (SON in Brief: 15).

The SONCAP publication did not list the regulated products to which the policy applies but it listed some products termed "Life Danger Items" to which non- conformity with the required standard pose potential danger to life and property which goods must not be allowed to reach the consumer unless they have been tested and confirmed suitable. These are motor vehicles and other types of tyres, food products, electrical appliances and products such as bulbs, cables, switches/gears etc (SON in Brief:15). Certain products are not included in this list, for example, petroleum products. Not having them in the list is surprising as they are among the products that pose the greatest danger to human life when they are not of the expected quality, and moreover, without them, most of the regulated items cannot be put into use or conveyed to their various destinations of use for the potent danger to manifest.

The SON's involvement in product import inspection and ensuring conformity within the country of locally manufactured goods is to the benefit of the Nigerian consumer which benefit includes improving the quality of life of Nigerians through consumption of quality products, protecting the Nigerian consumer from consuming health hazard, unsafe and poor quality products that can endanger life and ensuring that Nigerian consumers get value and satisfaction for their money through the consumption of quality products (SON in Brief : 17 – 18).

Consumer Protection Activities: Complaint and Investigation

By S 5(1) (a) of the Act, the SON is empowered to do everything necessary to ensure compliance with standards designated and approved by the Council. In order to actualize this, SON is involved in consumer protection activities. Therefore, the body has put in place Consumer Protection/Collaboration and Enforcement Unit which ensures that substandard products (both locally manufactured or imported) are apprehended or impounded particularly where the quality of the products deviate from the prescribed relevant specifications or may constitute health hazard or cause harm to life and property (SON in Brief:11). The defective products are confiscated and destroyed publicly to serve as deterrent to other manufacturers and importers (Section 17 (1) SON Act 2004). On the other hand, where the product is below the required standard but does not constitute health hazard, or create harmful effect to the consumer, the producer or importer concerned is directed or ordered to effect corrective measures to bring the goods to the required standard under the supervision of the organization (SON in Brief: 11). The SON also investigates consumer complaints and gives assistance in their resolution in collaboration with the manufacturers. Such consumer complaints provide a feed back in products performance and help to provide information on different aspects of standards implementation.

Thus SON receives complaints as to defective, sub-standard, fake and adulterated products. These complaints are investigated and if found to be genuine, then a remedial process is initiated to either compensate the complainants or the goods are repaired or replaced or the defaulting producer is handed over to the police as the case may be (Babatunde, 2000**).** The SON received and investigated about 166 consumer complaints' on various products between 1993 and 2002 (SON Annual Reports 1993 – 2002). Some of these information were from corporate bodies and private individuals. In most of these cases, the manufacturers /sellers against whom the complaints were made owned up to the complaints . They made amends and undertook to improve on the product quality. The above figure shows that only very few consumers complain about sub standard products which goes to show the poor consumer awareness in the country.

The organization could not investigate foreign products without the names and or addresses of the manufacturers or local goods without relevant information that may assist in tracing the manufacturer or producer (Monye, 2003). This probably accounts for the low number of consumer complaints received within 10 years as shown above. Again, the organization does not investigate products that have been tampered with as a matter of policy. Thus, such products were not among those investigated within the period (Monye, 2003). But the question is: Do consumers know of the existence of the SON, its role and with regard to those that know, are they aware of the effect of tampering with substandard products in relation to SON's investigation?

Inadequacy of the Provisions of the Act and Recommendations.

Most of the wrongs provided in the SON Act are criminal wrongs. They basically apply to standards. Section 15 of the SON Act makes it an offence for any person not the authorised manufacturer to use a standard established under the Act or a false certification mark purporting it to be the real one. The person on conviction pays N1000.00 fine or one year imprisonment or both. Likewise, not complying with the Mandatory Industrial Standard is an offence with a fine between N50,000.00- N100,000.00 or at least prison term of five years. The seller of such a product will be fined between N5,000.00 and N10,000.00 or at most two years imprisonment or both (Section 15 and 16, SON Act 2004).

The provisions of the SON Act present lesser areas of faults by reason of the fact that it deals mainly with the establishment and maintenance of standards. It has a minimal membership of seventeen persons and so performance will not be a hectic task. But the appointing authority, the Minister of Industries, solely appoints the representatives of the six ministries involved while the appointment of the representatives of other bodies is in consultation with the appropriate body (if any) (Section1 (1), SON Act 2004, S 1 (b and c) of the Schedule to the SON Act 2004). This means that where there is no such body, the minister alone appoints all the members of the organization without having recourse to any other person or organization. This portends danger as regards quality in that any matter that will come before the body from any person with the remotest relationship with the Minister will likely receive easy passage, an unsafe set-up for a body in charge of ensuring standards for products sold to the public we must agree. This is especially against the backdrop of the fact that it is the SON that certifies the quality of goods before they can be regarded as comsumable. So the appointment of its members should be carried out with proper checks and balances to ensure the appointment of the right persons.

Any member of the council is re-appointable as many times as possible (Section 4, SON Act 2004). There is no number of terms which the person will serve and he becomes ineligible to be re-appionted. This can make room for the appointment of stooges and people who may not be performing provided that the person(s) has a god-father that can influence his continuous stay in the organisation.

The organization does not investigate goods without the name and address of the manufacturer or producer (Monye, 2003), whether locally produced or imported. For such imported goods, the SON is supposed to be positioned at all ports and points of entry of goods in this country. So, how would such products find their way into the country in the first place? And where they do, is it not the SON that should be held responsible for their passage through the ports. It would therefore be untoward for it to turn back to assert its refusal to investigate such goods where there is a complaint by the consumers on them. The SON should be held culpable for the existence of such goods within our shores *ab initio*. Is not this a case of blowing hot and cold at the same time? This goes to show that the delays and possible denial of entry of goods without the issuance of SONCAP and consequential clearance by the custom declared in the SON in Brief, is a ruse. It will take negligence of duty on the part of the SON for such goods to come into this country. Import inspection ought to have revealed such unidentified goods.

The non-investigation of such local goods is nothing short of fighting shy and really shirking their responsibilities as it is empowered to enter any factory premises to investigate and carry out tests to ensure compliance with standards (Section 4 and 5 SON Act 2004). Besides, it can follow up and trace any manufacturer of any product through the sellers.

The organization or agency oversees the market place to ensure that quality products are imported into or produced in the country. The role of the SON in quality control is all-embracing.

The SON is to carry out tests on local and imported products to ascertain the standard and make certain that the required standard is maintained. To be able to carry out this function, it established the SONCAP and MANCAP for regulated products imported into the country and those manufactured locally. The body is urged to ensure that quality products are consumed in the country whether locally manufactured or imported. They must meet the minimum standard required by the law.

The appointment of members of the SON should be by the Minister in conjunction with specific bodies to be so named in the Act to avoid the appointment being a one-man affair with the attendant negative consequential effects. Such bodies whether nominating or recommending representatives, should endeavour to project and present people who are qualified academically and experientially but not in any way on the basis of federal character or quota system. Membership of the SON by the nature of `its functions, should be handled with deserving importance and not with levity and want of seriousness.

Conclusion

The position of the SON in the life of the consuming public makes it imperative that the organization must work optimally to satisfy the consumers. Appointment of members should be with utmost care with nominating/appointing bodies selecting qualified members. Such appointees should apply themselves to their duties. This will mean the SON functioning properly thereby, ensuring the production and consumption of quality products by the consumers.

References

Annual Reports of the Standard Organisation of Nigeria (SON) (1993 -2002).

Babatunde M. O., (2000) Institutional Regulation, *National Workshop on Consumer Protection*, NIALS June 27 – 29.

MANCAP in Brief: Mandatory Conformity Assessment Programme by the Standards Organisation of Nigeria (SON): To Ensure that all locally manufactured products conform to the relevant Nigerian Industrial Standards (NIS) before sale or export.

Monye F. N., (2003), *Law of Consumer Protection***,** Ibadan, Spectrum Books.

Pollit R. G., (1990). Standards Organisation of Nigeria *(SON) Journal* 1 (5).

Schedule to the Standards Organisation of Nigeria (SON) Act 2004

SON in Brief: A Brief Publication of the Functions and Duties of the SON by the Standards Organisation of Nigeria.

SONCAP in Brief: Standards Organisation of Nigeria Conformity Assessment Programme by the Standards Organisation of Nigeria (SON): A set of conformity assessment and verification procedures applicable to certain regulated products imported into Nigeria.

Standards Organisation of Nigeria Act, Cap S 9, Laws of the Federation of Nigeria 2004 (SON Act, 2004).

THE IMPERATIVES OF SCIENCE AND TECHNOLOGY EDUCATION FOR NATIONAL DEVELOPMENT

Amos Maikano

Abstract

This paper attempts to examined the items of the seven – point agenda of President Umar Musa Yar'adua in their national context, highlighting some of the developmental problems which the reform agenda specifically education set out to solve. It then identified and discussed the ways Science and Technology Education (STE) may be harnessed towards actualizing the reform agenda. STE as an instrument for achieving the seven – point agenda for Nigeria development have the "Chicken and Egg relationship" for goal realization. The President's seven – point agenda and Vision 20/2020 are appropriate, relevant and provide necessary strategic platform for Nigeria's take off to becoming a great, dynamic and industrialized economy. Some of the recommendations proffer are: faithful implementation of the free and compulsory UBE, adequate funding of the educational sector, special incentives should be given to science and technology teachers' to encourage them to take up challenges.

Introduction

Nigeria's efforts at development since independence in 1960 have seen a number of well articulated national development plans. More recently, developmental targets have been expressed in international acclaimed terms such as Millennium Development Goals (MDG's), Vision 2010 and 20/2020 and National Economic Empowerment and Development Strategy (NEEDS). Unfortunately, efforts to achieve national development through previous development strategies have been unable to yield the expected results. Hence, the nation remains on the lowest rung of the development ladder as the majority of Nigerians continue to wallow in abject poverty, neglect and deprivation. While the few rich continue to get abundantly richer (Abah, 2008).

Against this uncomfortable background, has risen what appears to be a ray of hope in the form of the seven – point agenda of the present Nigerian government led by President Umar Musa Yar'adua. Right from his campaign manifesto up to the 2008 budget, President Yar'adua has held on to the seven – point agenda as a mark of his good will and commitment to the upliftment of the lot of the majority of Nigerians. Hence, he has adopted the agenda as his most immediate area of focus for the development of the nation (Abah, 2008).

The thrust of this paper therefore examines the context of the seven – point agenda, highlights the problems that have hindered development and which the agenda hopes to overcome, then explores how science and technology education may help towards actualizing the agenda.

The Seven – Point Agenda in Context

In the course of reviewing materials for this paper, the author observed that what the information media have put out as items of the seven – point agenda tend to show some variation. For example, a list released to the Press by the presidency and retrieved from the internet (Presidency, 2007), gave the items of the seven – point agenda as power and energy, food security, wealth creation, transport sector, land reforms, security and education.

Another source (Ochiama, 2008) also retrieved from internet, stated that, in his inaugural speech on 29th May, 2007, President Yar'adua enumerated the seven – point agenda as power and energy, food security and agriculture, wealth creation and employment, mass transportation, land reforms, security, qualitative and functional education and pursuance of the rule of law. Recently, information from a source in the Presidency (though unpublished) listed the items of the seven – point agenda as electoral reforms, electricity and power generation, health, human rights, agriculture, fight against corruption, education.

The noticeable variations in the items of the seven – point agenda, despite the great similarities in many of them may be due to one or more of the following reasons. Firstly, it may be due to the usual changes that occur to original information as it is transmitted down the line in the

communication chain. Secondly, some of the points could be expressed in different ways without much change to the original intent, and so, advantage is being taken of this. Thirdly, some of the points are closely interrelated and may be merged to bring other essential areas into prominence.
In view of all the above, the following aspects of the seven – point agenda of President Yar'adua have been selected and streamlined in this paper viz:

1. Education
2. Electoral reforms
3. Power and Energy
4. Agriculture and Food security
5. Health and Security
6. Mass transportation
7. Wealth creation and Employment

Education as one of the seven – point agenda is examined below in its national context, with the aim of identifying the main problems that need to be solved in order to achieve national development.

Education

The reform in the education sector as elucidated by the Presidency (2007) is two folds. Firstly, it is aimed at ensuring the minimum acceptable international standards of education for all. Going by the United Nation's Millennium Development Goals, this implies Universal Primary Education (UPE). But Nigeria has gone a step further to Universal Basic Education (UBE) which includes education for six years in primary school and three years in junior secondary school for all citizens. The second aim of the reform is a strategic educational developmental plan which will ensure excellence in both the tutoring and learning of skills in science and technology by students who will be seen as the future innovators and industrialists of Nigeria. Government plans to achieve this reform through massive injection of funds into the education sector (The Presidency, 2007). In a budget of ₦1.986 trillion for the year 2008, a total of ₦210.45 billion was allocated to the education sector, an increase of 12% over the 2007 allocation. This excludes government intervention through the UBE commission, through which an additional resources of ₦39.7 billion was provided to the States and Local governments to support basic education. The allocation was mainly for improving human resource capacity building , upgrading of facilities in educational institutions and improvement in quality and access to education. In the year 2009 budget, ₦2.87 trillion was ear marked and only ₦33.6 billion was injected in to the educational sector. There was a short fall of ₦176.85 billion(a decreased of 84.03% over the 2008 allocation) excluding the₦39.7 billion for UBE. Where are we really heading to with this inconsistencies in our policies?.

Science and Technology Education as an Instrument for Achieving the Seven – Point Agenda in Nigeria for National Development.

As outlined above, the seven – point agenda is a broad spectrum reform, planned by government for the economic emancipation of the nation. The possibility of using science and technological education as a key to achieving the agenda rests on governments belief as stated in the National Policy on Education (Federal Republic of Nigeria, 1998), that education is an instrument par excellence for effecting national development. It also rests on the nature of science and technological education and their applicability to the national problems which the seven – point agenda seeks to solve (Abah, 2008).

Science may be viewed as a way of studying the things, events and phenomena that occur in nature as well as the knowledge that results from such studies. The "way" sciences uses to study nature is always practical and involves several types of processes such as making observations, measuring things, asking questions, formulating hypotheses, carrying out experiments and what have you before arriving at the findings or knowledge (Abah, 1982; 1998). According to Ikoku (1989), science and technology education could be described as an organized instructions both formal and informal designed to produce a corps of people who can utilize the ever growing body of scientific and technology knowledge in productive endeavours, teaching and skills transfer. Furthermore, some of the trained corps would be committed to the advancement of scientific and technological knowledge through fundamental or target researches. It is on the basis of this that countries and

societies all over the World use science and technology education as a veritable instrument of an accelerated national development.

The extent to which science and technology education can be use for national development as envisaged by President Yar'adua in his seven – point agenda depends upon the extent to which science education can vigorously and vehemently pursued in terms of application and adoption of the of the acquired scientific skills. According to Okebukola (2002), Nigeria is third rank after Pakistan and Bangladesh. Although Nigeria is rich in natural and human resources, seven out of every ten Nigerians live on less than a dollar per day. The situation is compounded in Nigeria with the low level of investments in scientific research, easily one of the lowest in Africa and in the World as depicted in table 1 below:

Table 1: Expenditure for Science and Engineering, Research and Experimental Development.

Country	% of Group
Africa	
Nigeria	0.1
Benin	0.7
Mauritius	0.3
Egypt	0.2
North America	
Canada	1.4
Cuba	0.8
U.S.A	2.9
Silica	2.9
South America	
Argentina	0.4
Brazil	0.4
Chile	0.5
Venezuela	0.3
Asia	
India	0.9
Israel	3.1
Japan	2.8
Singapore	0.9
Europe	
France	2.3
Germany	4.3
Netherlands	2.2
U.K	2.0

Sources: UNESCO 2002 World Science Report)

Okebukola (2002) pointed out "clearly the minimum needs of human society, however, populous would have to be met in terms of food, shelter, clothing, water, energy, employment, basic education and health care". This is the reflection of the seven – point agenda of President Yar'adua. Without science and synergistically related discipline, technology, development in these sectors is nowhere. This is because the economic strength of any nation has ceased to increase by quality of natural resources a country has. Rather, to a large extent on the level of investments, it is also able to attract and to a greater extent on the number of scientifically skilled professionals in turn offer services which accounts for significant percentage of Gross Domestic Products (GDP's) of many countries (Turaki, 2005).

No wonder, today countries like Japan with little or no natural resources have concentrated all their attention on science and technology and with that they were able to become a force to reckon with in this World. The United States of America has remained the most successful example of the harnessing of the combine scientific and technological expertise of government, industry and science from the Universities for the attainment of its national objectives. It is unfortunate that in a

country of ours " that flow with milk and honey" government has remained largely aloof and indifferent to the activities of societies and scientific activities at least from the point of views of research grant allocation (Wasagu, 2005). Knowledge of science and technology is an important element of what it means to be an educated person in the 21st century. This is because science and technology provides the only formidable base in which national development can successfully stand.

Hurdles towards Utilizing Science and Technology Education for National Development

It is a fact that teaching of science and technology have been guaranteed in Nigeria educational system, but the utilization of technology to attain development have been very slow. The factors responsible for this can be associated with the followings:

1. The science that is being taught in our schools have been too academic and thus produce more conservators of knowledge than innovators who are concerned with the how, why and what scientific knowledge mean and can do for individual and nation.
2. The methodology being employed in teaching science in secondary schools, Colleges of Education, Polytechnics and Universities is predominantly non – practical in nature and does not engender functional understanding of science. Consequently, science is presented as being difficult to students and therefore learn by memorization. The ability to present science through practical oriented methods does not allow learners to become oriented in the exercise of inquiry which is the characteristics of scientific examples. As a result, learners are not exposed to the processes and ethics of science.
3. Lack of standard and appropriate text books that can promote inquiry, teaching and learning. Most indigenous text books written today and that are being used in our schools have their contents not directed to the day to day interaction with nature and experience of the learners but towards passing examinations and not those that will help to foster development of critical and creative thinking.
4. Gross inadequate funding of science and technology education. The funding as contained in the National Policy on Science and Technology (FMST, 1986) is that the federal government shall provide fund for science and technology education on a continuous basis. And the expectation that by 1990 at least 1% of the annual GDP would be expected on science and technology quest but appeared to be a mirage. No wonder, it has resulted into the poor state of the necessary teaching facilities and resources for basic science in Nigerian Secondary schools, Colleges of Education, Polytechnics and Universities. Therefore, the nature of the practical work that we embark in the laboratories do not promote the acquisition of practical skills necessary for scientific and technological advancement.
5. Lack of committed science and technology leadership and political will for policy implementation is another stumbling block in harnessing the abundant resources bestowed in Nigeria. It is worth noting that success story of Japan in science and technological field and the achievement in space science in USA (1957) were reported to be based on a well planned and well implemented science and technological education programme sustained by an intellectual tradition and enlightened political leadership (Mustapha, 2003). Nigeria educational sector is beleaguered with policies somersault formulation and implementation of policies (NCCE, 2008).

Science Teachers as Veteran Stakeholders towards the Actualization of the Seven – Point Agenda for National Development

The impact made by any system of education in any particular country depends largely on the quality of teachers. Because teachers are largely responsible for the translation and implementation of education policies, curriculum design and development, instructional packages and assessment of learning outcomes at the levels of the learners. Teachers instructional leadership roles exert a lot of influences on the character formation and the process of socialization of the children with the learning environment (Moh, 2007).

Today, no segment of human activity has been left untouched by the results of scientific thoughts. In fact, almost every present activity of human rests squarely on the fruits of science. We live in a society that is fast driven by science and technology and permeated by science and

technology based artefacts and processes. Young people seem to have an excessive willingness to use and over use the new technologies (PC's, Internet, Cellular phones, Digital sounds and Video). As Bardowell (1999) observed: " we live in a World that is being driven by science and technology". The rapid changes in science and their conversion into technology have dictated the development prospects of many nations.

Nigeria like any developing country rely totally on science and technology education for rapid development, the success of this will in turn depends on the quality of teachers, teachers' trainers, facilities and infrastructure of the institutions that produce the teachers for the country. Accepting the fact that " no educational system can rise above the quality of its teachers" it follows that scientific and technological products being displayed in developed countries have their roots in the quality of teachers that operate the educational system with active support from their respective governments. While the developed countries commit significant proportion of their GDP to the development of science and technological education. In Nigeria, huge amount of money is spent on importation of finished products (Ogunwole, 1998).

If you look at Nigeria and Japan, where they have almost the same population, but in terms of GDP, every Japanese citizen is said to be equivalent to more than 30,000 Nigerians. The table below presents the economic disparity between the two countries.

Table 2: Comparison between Economic Strength of Japan and Nigeria

S/NO		Japan	Nigeria
1	Population	127 million	140 million
2	Natural Resources	Little	Numerous
3	GDP per capita	2.90 trillion	900 US
4	Electricity	948.6 billion KWH	15.67 billion KWH

Source: Daily Trust, Feb, 2005

The economic disparity between Japan and Nigeria can be traced to differences in technological capacity and adaptation. As Turaki (2005) commented, "technology is the advantage that Japan has over Nigeria". The impact of science and technology education on the economy of Japan today has made it not only the second largest to the World strongest economy USA but a threat to it.

Leadership and Development

For a country to be an effective player in global governance, it has to be able to tap the benefits of globalization for the well being of the citizens. This can only happen if the leadership is able to measure up to global expectations in driving a dynamic economy where global partnership plays a key role in the development of human capital (Ardo, 2008). In the light of this, President Yar'adua is in the right tract. Right from his campaign manifesto up to the 2008 budget he has held on to the seven – point agenda and making Nigeria one of the twentieth economy by the year 2020 (Vision 20/2020).

Conclusion

The seven – point agenda of the government of President Yar'adua is a great visionary leap for the economic emancipation of Nigeria. I believe that if we are to achieve World class standards, we definitely need a critical mass of teachers within the profession who seen it, firsthand what they do in other countries and then apply that knowledge back in the class room. Given the political will and commitment to the study of science and technology, Nigeria will not only have functional science and technological but will consequently solve its national problems and can be classified as technologically developed. Wasagu (2007) quoted Eniefu and Akpan (2004) who pointed out that "Modern socio – economic development of a nation normally depends upon the availability of more scientists, Engineers, Technicians and other professionals with scientific training.

Recommendations

As a way forward in the attempts to actualize Vision 20/2020 and the seven – point agenda, the following sectoral reforms in education will serve as a spring board to national developments:

1. Faithful implementation of the free and compulsory UBE.
2. Review of school curricula from primary to tertiary to incorporate vocational and entrepreneurial skills.
3. Re-tooling and repositioning of technical schools to be able to address technical manpower needs of the economy.
4. Establishment of more vocational centres to encourage Nigerians to embrace vocational education.
5. Review of school curricula at all levels to incorporate the study of information and communication technology (ICT).
6. Sustain existing vocational on the job training programmes.
7. The involvement of all stakeholders and the adoption of bottom – up rather than top down approach in the formulation and implementations of development plans, visions and educational policies.
8. Governments of Nigeria should provide adequate funding to education for staff and infrastructural development as indicated in UNESCO 26% of annual budget for education.
9. The hydra – headed problem of corruption should be tackled with the strongest political will. The issues of good governance, transparency and accountability should be emphasized and vigorously promoted to provide a socio – economic environment conducive for vision and development plan implementation.
10. The teachers' salary scale (TSS) should be effected and attractive science teachers' allowance provided to attract brilliant Nigerians into the teaching profession to teach science and technology education courses in schools.
11. The roles and functions of all institutions related to teacher preparation, registration and licensing e.g. NTI, TRCN should be synchronized and coordinated to position them to work together for achievement of national educational aims and objectives.
12. Teaching and learning of science and technology education in Nigerian languages namely Hausa, Igbo and Yoruba is apposite.

References

Abah, C.O. (1998). Science, Technology and Mathematics as catalysts for meeting the challenges of 21st century in Nigeria. *Oju Scientific and educational review.* 1 (1), 1 – 14.

Abah, C.O. (2008). Science, Technology and Mathematics Education: A key driver to achieving the Federal Government's seven – point agenda. A lead paper presented at the 2008 Annual Conference of School of Science, Federal College of Education, Zaria.

Ardo, G.V. (2008). Leadership, Globalization and Development in Nigeria: The Imperatives of Science, Technology and Mathematics Education. A key note address at the 2008 Annual Conference of School of Science, Federal College of Education, Zaria.

Bardowell, M.E. (1999). Educational Technology in the popular view of Science and Technology. *CASTME Journal* Vol. 19 (1) 15 – 23.

Federal Ministry of Science and Technology (1986). *National policy on science and technology.*

Ikoku, C. (1989). Science and Technology Education for rural development. A key note address delivered at the 30th annual conference of STAN Held at Federal University of Technology, Minna.

Mohammed, Z. (2007). The 2008 Budget; MDG's and President Yar'adua's Seven – Point Agenda. *Business day* 14th Nov, 2007.

http://www.business – day online. Com/economic – watch / 1072.htm.

Mustapha, M.T. (2003). The Impediments to utilizing Science for self reliance in Nigeria. A paper presented at the first National Conference held at Federal College of Education, Kontagora Niger state.

National commission for Colleges of Education (2008). A communiqué issued at the end of National Conference on Teacher Education and Vision 20/2020.

Federal Republic of Nigeria (2004). *National Policy on education*, Lagos: NERDC Press.

New Nigerian, 2008 budget No. 13660, Nov,9 2007. Pg 1, 3.

New Nigerian, 2009 budget No. 13935, Dec, 3 2008. Pg 1,2.

Ochioma, C. (2008). Yar'adua's seven – point agenda. A performance Assessment. http://naija info. Blog spot. Com/2008/02/Yar'adua's seven point agenda performance html.

Ogunwole, E.A. (1998). Dimension to continue professional development of Science, Technology and Mathematics teachers. A key note address delivered at annual conference of STAN held at F. C. E Kontagora.

Okebukola, P.A.O (2002). Beyond the Stereotype to New Trajectors in science teaching. Lecture at 43rd STAN conference held at Port Harcourt.

Turaki, E. (2005). Economy as it relates to science. *Daily Trust* Vol. 10(7) 34 Feb 28th.

Wasagu, M.A. (2005). Solving National Problems through Science, Technology and Mathematics Education. A Lead Paper presented at the 3rd National conference organized by Sch. Of Sci, F.C.E Kontagora.

Wasagu, M.A. (2007). Functional Science, Technology and Mathematics Education for National Economic Empowerment and Development. A lead paper presented at the 3rd National conference organized by school of science, Federal College of Education, Zaria.

ROLE OF TECHNOLOGY AND VOCATIONAL EDUCATION TEACHER AS A SAFETY MANAGER IN TECHNICAL COLLEGES

K. H. Bulama (Ph.D); D. W. Quahha; T.J. Tika and R. N. Gayus

Abstract

The issue of the safety of students and facilities in our technical colleges and Vocational schools is becoming more sophisticated due largely to the rapid technological development taking place across the Globe. Nigeria is in dare need to have a place among the first 20 most developed nations of the world by the year 2020. This desire poses a greater challenge to the Technology/Vocational Education (TVE) teacher in the area of the safety of students and facilities, since they occupy a central position in the training of low and middle level manpower in the economy. This responsibility placed on TVE teachers demand high level of competence in handling safety matters, particularly the issue of education; such as accident prevention, care of facilities and handling of accidents when they occur. This paper advocates three major roles of the TVE teacher in ensuring the safety of students and facilities in technical and vocational education institutions. Some recommendations were made which if adopted and practiced would go a long way in ensuring the safety of both the students and facilities in our nation's technical and vocational institutions.

Introduction

Safety was not considered to be a matter of public concern in the ancient times. Accidents were considered as a supernatural phenomena which man cannot do anything about. According to Encyclopedia Britanica the modern notion of safety developed in the 19th centaury as a result of the industrial revolution in Europe a period during which terrible factory accidents claimed thousands of lives.

Nigeria has set for itself a new vision called vision 2020. The heart desire of the people and government of Nigeria is to move away from the present state of development and move to a new status of belonging to the 20 most industrialized nations of the world. During the process of realizing this vision, it is obvious that huge quantity of dust and noxious gases would be released into the environment, thousands of decibels of noise would fill the air and large unwanted quantity of radiation would be represent in industries. All these hazards and others not mentioned would cause large number of human causalities and damage to physical infrastructure (Apagu, Bulama and Diraso 2000).

Technology and vocational education (TVE) at both secondary and tertiary levels of education is an effective instrument for developing the required human resources for the national vision. The National Policy on Education in FRN (2004) defined TVE as the study of technologies for the acquisition of practical skills, attitudes, understanding and knowledge related to occupations in various sectors of the economic and social life of the citizens. Furthermore the Policy sees the TVE as a means of preparing citizens for various occupational fields and for effective participation in the world of work. It is also seen as an instrument for promoting environmentally friendly production process for sustainable development.

In order to effectively achieve the goals of TVE, the policy specified a number of trades courses which include among others, mechanical, computer, building, woodwork, hospitality and textile trades. Others are printing, beauty culture, business and leather trades. All these trades involve use of dangerous equipment, and chemical that can affect the health of human resources engaged in various process of production. All the safety problems can however be reduced by putting in place proactive safety strategies, so that causality can be reduced to the bearest minimum.

The TVE teacher is at the centre of the implementation of the technical and vocational education curriculum. Various scholars such as Uga (1996), Okoro (1999) and Okrie (2001) agree that the TVE teachers has the responsibility of meeting the goals of TVE curriculum including the development of safety consciousness and accident prevention during practical lessons. The teacher

has enormous task of ensuring the safety of the students and the facilities as he strive to implement the curriculum.

This paper aims at unveiling the roles of the TVE teacher as a safety manager in ensuring the safety of students and facilities in schools. Specifically accident prevention, accident scene, and post accident roles are being considered for improving the safety of students and facilities during training process.

Technology and Vocational Education Teachers

The technology and vocational education teacher occupy a most important place in the modern society because he is the link between the industries, the society and the educational system. Etuk (1987) is of the view that the quality of TVE depend upon the teachers. For the teacher to sustain the linkage he should be devoted to the pursuit of excellence in order to discharge the overall goal of technical and vocational education.

The competence of TVE teachers is an important factor for the implementation of the curriculum of TVE. Okorie (2001) advised that the teachers should be well educated in the various form of TVE to ensure effective teaching of theoretical and practical aspect of this form of education. The competence factor enables the teacher to play an effective role in safeguarding the lives and facilities used in imparting the required skills for self reliance and development of technology in the country.

The Role of the TVE Teacher as a Safety Manager

The prevention of accidents in a College workshop is the duty of every staff and students working in the workshop. For a TVE Teacher as a safety manager ensuring the safety of others including himself as well as the facilities is of particular importance. This is because he is like a captain of a ship, he direct, coordinates and organizes the affairs of the workshop. Nick (2007) believes that frequent accidents in the workshops lead to lost of confidence by the students and staff thereby discouraging learning and production processes.

It is therefore necessary for accidents to be reduced through involving both students and staff in its prevention under the effective leadership of the TVE teacher. This paper discusses three major roles of TVE teachers as a safety manager in ensuring the safety of students and workshop facilities. The roles are accident prevention, accident scene role and post accident role. Each of the roles is discuss in detail.

1. **Accident Prevention Role**

The International Labour Organization ILO (2005) In a statistics of occupational accident across the globe stated that 2.2 million men and women are victims of work-related accidents or diseases every year. Death due to work related accidents and illnesses represent 3.9 percent of all deaths across the globe. The TVE teacher by virtue of his profession as a teacher of potential workforce in the industry can play significant role in instilling safety consciousness to students at the early stage. This will go along way in accident prevention through identification of causes of accident, educating staff and students, identification and control of hazards, safety inspection programme and enforcement of safety rules and use of protective wears. A birds eye view of each of them will be made.

(a) Identification of causes of accidents

Accidents are caused mainly as a result of Human and the employer or management factors. Ibhadode (2001) enumerated some of the major causes of accidents in workplace and school workshops. They include:

i. Insufficient skills among the workforce.
ii. Lack of adequate safety knowledge in relation to the job at hand.
iii. Poor work habit and attitude when carrying out specific job which may require proper work habit.
iv. Unsafe behaviour among students and the workforce in a school workshop and
v. Hazards that exist in the work environment

(b) Identification and control of hazards

This is the next preventive role that the TVE teacher need to embark upon to ensure the safety of the students, staff and facilities. Ibhadode (2001) defined hazard as any condition which cause actual or potential loss or damage or undesirable effect on human capital and infrastructure in a workplace. Hazard may come in any of the following forms:- physical, biological, Ergonomical psychosocial and mechanical.

The identification of hazards by the TVE teacher is made possible through the training he received during his technical teacher training programme, experience on the job, regular inspection of workshop facilities and observations of the students and staff activities during working sessions. After identifying the hazardous conditions the TVE teacher need to evaluate the situation with the aim of:

- Determining the probability of an identified hazard occurring
- Quantifying the hazard such that if it happens how serious the effect would be on students, staff and the facilities.
- Proposing a solution to nullify the effect of the hazardous condition on students, staff and the facilities (Ashfahl 1994).

Hazard control involves the effective implementation of solution from the hazard evaluation process. FRN (1990) spelt out clearly the workplace hazard control. In particular part III, IV and V of the document can serve a very useful purpose in controlling hazardous conditions in the workshop.

(c) Educating the students and the staff

The TVE teacher can prevent or reduce the rate of accident by educating the students and staff. William (1998) posits that such education can bring about modification on safety beahaviour. This according to him can be achieved through:

i. Organizing safety training workshop, seminars, conferences etc. Resources persons from industry and universities can be invited to make presentation, this will give the opportunity for the students persons to interact freely with safety experts.

ii. Staging safety awareness campaign through dramas, display of safety posters at strategic places in workshop and distribution of safety hand bills

iii. Organizing award ceremony to reward staff and students who exhibited exceptional safety attitude and action within a specified period of time. This would go a long way in motivating the beneficiaries.

During any safety training and safety campaign programme, FRN (1990) recommends that emphasis should be placed on:

- Personal safety requirements such as personal hygiene and use of appropriate safety wears in the school workshop and workplace.
- Machine tools and equipment safety requirements such observance of carrying capacities of machine, operational procedures and safety requirements in handling each and every machine and equipment.
- Observance of environmental safety rules such as effective use of ventilation and illumination provided, effective use of emergency exit when need arise and proper stalking of materials in the workshop and work environment.

One of the desired levels that students and staff should attain after the various educative sessions is the development of safety consciousness, which William (1998) define as a mental awareness or understanding of existence of a dangerous object, state or influence. This mental state enables staff and students to work. with high level of concentration.

(d) Safety inspection programme

This is a major accident preventive role of TVE teacher in a workshop set up. George Mason University safety office recommends the appointment of a supervisor in each unit of a workshop to carry out the following responsibilities under careful supervision of a TVE teacher:

- Proper instruction on safety matters to new comers and visitors in hazard prone area.
- Effective use of safety checklist to make sure that all safety factors are properly inspected

- Keeping accurate records of accidents and their causes and taking effective action where special trend appear
- Putting in place a system where everybody feels he/she is part of safety programme in the workshop through the rotation of inspection exercise no matter how small the exercise appear and
- Effective supervision of the appointed safety supervisors or inspectors.

(e) Enforcing Safety Rules and Use of Protective Wears

FRN (1990) requires that all safety rules and regulations in workshops and workplace must be enforced to the later to ensure the safety of the students, staff and facilities. All aspects of the safety rules and regulations such as general safety rules, safety in the work premises, safety rules in machines operation, and safety regulations in high altitude works. Other safety rules and regulations are in relation to repair of mechanisms, fire protection strategies and prevention of electric shocks. A committed TVE teacher strives to ensure that all safety rules and regulations are strictly obeyed. Protective wears and equipment, protect the worker or student from direct bodily harm or injuries. Tomhnson (1984) in Shehu (2008) categorized the wears and equipment as shown in Table 1.

Table 1: **Personal protective safety equipment, parts of the body protected and hands**

Body Part Group	Protective Equipment	Hazard(s)
1. Eyes & Face	Safety glasses splash-proof goggle, impact goggle, face screen, welder's mask etc.	Dust, Electric flash, flying objects and rays.
2. Head	Hard hat, Bandanna, Flame-retardant cap, leather cap, Acid Proof hoods, hair net etc.	Falling objects, hair catching in a rotating parts of machines
3. Ear/Mouth	Plugs and Muffs, protective Masks, gas respirators, dust cartridge.	Noise, toxic and non-toxic dust.
4. Hand and Arms	Glooves (Leather, Asbestos, Synthetic and metal mesh) sleeves and ganlets.	Cuts, abrasior, burns, electric hocks spark etc.
5. Feet and Legs	Safety shoes, synthetic boots, shin guards and wood-soled shoes	Heavy or sharp objects, rough surface, spark from welding burns etc.
6. Body	Boiler suits, warehouse coat	Dust or dirty

Source: Shehu, 2008

2. **Accident Scene Role**

The provisions in FRN (1990) address accidents and industrial diseases. The TVE teacher should adhere to the provisions. Accidents in workplace and school workshop according to the provisions include cuts, bruises, injury with profuse bleeding, burns and carbon monoxide poisoning. Others are fracture of bones, electric shock and eye injury. If all effort to prevent accident fail and any of these accidents occurs the TVE teacher as a safety manager has to play a major role in taking care of the situation, with other staff and students providing necessary assistance. FRN (1990) provides that the safety Manager (TVE teacher) should take the following vital steps to help the victim as soon as possible.

i. Assist the victim through the effective use of the First Aid service. It is necessary to ensure that the First Aid Kit is well equipped to take care of unfore-seen challenges.
ii. Take the appropriate step to control emergencies
iii. Avoid becoming a casualty in the process of saving the situation through taking appropriate precautions.
iv. Transport the injured person, taking note of all the recommended method, depending on the magnitude and type of injury sustained.
v. Inform the appropriate authorities that the accident has occurred.

3. **Post Accident Role**

The post accident role has to do with what the TVE teacher does after taking all necessary measures to contain the accident that occurred. The following are the major post accident roles.

a. The TVE teacher should report to the principal of the college all he needs to know about the accident. FRN (1990) has prescribed a form for reporting accidents. The form is LAB/F/06. Another form (LAB/F/10) is for reporting outbreak of diseases in a workplace as a result of industrial pollution. The school authority should access the form from the nearest Federal Ministry of Labour and Productivity office.

b. The next post accident role is the appraisal of the condition that caused the accident. The TVE teacher in carrying out the role, assesses the human factor involved in the accident and the state of the facilities involved. The information obtained is analyzed and put to use to prevent future occurrence of accidents.

c. The TVE teacher uses the information to develop accident and cost control method, safety programme and the procedure to implement the safety programme to safeguard the students, staff and the facilities.

Conclusion

The TVE teacher today is faced with greater safety challenges. This is because the issues of safety is becoming more sophisticated as a result of rapid industrial growth across the globe. The TVE teacher in Nigeria should put more emphasis on prevention of anticipated hazards in the college workshops to ensure the safety of students, staff and the facilities. Nigeria has an ardent desire to be among the first 20 developed nations by the year 2020. It is a known fact that industrial development is accompanied by hazards as experienced during the industrial revolution in Europe. These industrial hazards should not slow down the growth of industries in Nigeria. The TVE teacher has roles to play in the achievement of our national vision by striving hard to create safety conscious workforce right from our technical and vocational schools, who shall no doubt be in the centre in the realization of our nations industrial growth and development.

Recommendations

In view of the need to protect students staff and facilities and the need to develop safety consciousness in the students and staff, the TVE teacher need to be given attention in the area of developing competence in handling safety issues. Based on the important role the TVE teacher plays in ensuring the safety of students, staff and facilities, this paper recommends that:

i. Training workshops should be organized for TVE teachers to enable then update their knowledge and competence in handling safety issues.

ii. Safety equipment and protective wears should be made available to all staff and students in the workshop.

iii. Fire extinguishers should be provided and serviced regularly for effective fire control incase of its out break.

iv. To ensure a safety conscious generation of Nigerians public and occupational safety should be incorporated into the senior secondary school and post-secondary school curricular.

v. Non-governmental organizations (NGOs), students bodies etc. should be encourage to form safety associations to enlighten themselves and the public on safety matters.

References

Apagu, V.V., Bulama, KH, Diraso, D.K. (2000). Industrial safety \training progamme; Curriculum for Technical Schools/Colleges in Adamawa State. *Nigeria Journal of Education and Technology* 1 (1), 1 80 – 188

Asfahl, C.R. (1984). *Industrial safety and health management*. New Jersey: Prentice Hall Inc

Etuk, G.T. (1987). Developing curriculum for technical and vocation teacher education and Training *Technical Review* 1(1) 19-26.

Federal Republic of Nigeria, (1990). *The laws of the Federation of Nigeria* Factories Act (CAP 126).

Federal Republic of Nigeria, (2004). *National policy on education* (Reviewed Ed.) Abuja: NERDC Press.

George Mason University Safety Office: *Infrisbby@gmu.edu* . Retrieved on 04/09/2008

Ibhadode, M.O.R (2001). *Introduction to manufacturing technology* Benin: Ambik publisher

ILO (2005) World day for safety and health *safework@Il.org* Retrieved: 02/05/2006

Nick, N. (2007). Construction safety in technical education: A dead over sight. **http://www.asseorg/academics** *Journal/ossfau -featurearticle 02 php***.** Retrieved 02/05/2005.

Okorie, J.U. (2001) *Vocational Industrial Education***.** Bauchi: League of Researchers.

Okoro, O.M. (1999). *Principles and methods in vocational and technical education***.** Enugu: University Trust Publishers.

Shehu, I.Y. (2008). stakeholders' role in maintaining safety in school workshop and industries. *Journal of technology and Education Research* 1(1) 278-289

Uga, O (1996). *Curriculum development for Africa* Ibadan: Africana FEB Publishers.

William, W.A. (1988). *Training Manual for Accident Programme* New York: American Technical Society.

ROLE OF TECHNICAL EDUCATION IN NATIONAL DEVELOPMENT

Dr Muhammed Aliyu and Isyaku Mohammed Dabban

Abstract

National development, measured by the degree of socio-economic advancement of a country, reflected in her positive changes in science and technology, is a function of the standard of technical education available to her citizens. This paper attempts to discuss the gradual development roles, problems and prospects of technical education in Nigeria's national development. Brief references were made to the background of technical education and the attendant misconceptions that tend to hinder its progress. Some instance of the role of technical education and the importance of skill acquisition and self reliance as the panacea to national development were highlighted. Recommendations suggested and the conclusion made by the authors are personal opinions deduced from the context of the discussion.

Introduction

It is neither a mere coincidence nor a mater of divine providence that some countries are designated as developed while some others are perceived as developing or underdeveloped. The difference between the developed and the underdeveloped lies on the choice of value and the methods by which the values are pursued. The developed relies on man's ability of determine his fate, and therefore adopts an inward approach in directing development programmes to satisfy her aspirations (Onosode, 1993). That a country is developed means that she has appreciated that nothing moves without being moved and nothing changes unless it is changed. She has therefore developed new skills, new attitudes to life and to work, and developed ever adjusting strategies to confront new challenges. The instrument through which these changes are achieved is technical education, both formal and informal. Technical know-how, appropriate use of tools of all kinds, are related to the attitude of the user.

Technology education according to Eze (1987) emphasized the acquisition of technical skills; knowledge and work attitude as well as the methods for imparting them to students. Therefore the National Policy on Education (NPE) (1981) defined technical education as "that aspect of education which leads to the acquisition of practical and applied skills as well as basic scientific knowledge". The provision of technical education enables the human and natural resources of a nation to be properly utilized and harnessed. Technical education can be said to have contributed to national development prior to and after the nation's independence till date. National development in context of this paper may be viewed as the measure of standard acceleration of a country from primitivity to civilization reflecting in economic, social, cultural and political advancement. The basis of measurement is essentially the quality of changes, productivity, socio-political decency and per-capita income of a nation.

Productivity which is the measure of the efficiency with which a nation's resources are transformed into commodities and services is not simply a function of the amount of mineral oil, raw materials, physical capital and human population, available but depends heavily on attitudes knowledge and skills of the people which in turn reflects the education, training and complex organisation which technical education provides (Peter, 1981).

The objective of this paper is therefore to discuss the evolution and roles of technical education to national development from the pre-independence era till date and by highlighting the problems therein.

Background of Technical Education in Nigeria

The concept of technical education in Africa, vis-a-vis Nigeria is synonymous with the concept of manpower development. The popular Ashby commission report on Nigeria's higher education needs and the simultaneous Harbison commission report on the country's high level manpower needs (both commission appointed in 1959 to investigate and higher education recommend needs for 1960 – 1980) were concurrent on the principal objectives of producing locally trained and certificated manpower to bridge the gap between the top and the lower levels (Taiwo, 1976).

However, while Ashby commission emphasized on establishment of institutions to meet the increasing demands for high level manpower, Harbison commission concentrated more on categorizing the manpower levels. The latter outlined two essential levels for national development, viz: the senior and the intermediate. Harbison predicted that by 1980 the ratio of intermediate high level manpower to the senior high level to be needed would be 5:2. The intermediate cadre would be college gradates while the senior cadre would be university graduates. College here includes all post-secondary institutions below the university status. This is where the present polytechnics, colleges of science and technology (including colleges of agriculture and other resource institutes), colleges of education, technical colleges and many advanced training schools fall into. The newly introduced universities of technology are an advancement in the system (Mobisson, 1988).

Misconceptions about the Advent of Western Education in Nigeria

It is wrong for Nigerians to continue to lament indefinitely over the background education we inherited from the colonial system. After all, the colonialists did try taking the risks involved in bringing education to the interiors of Africa, whether for their economic or evangelical interests, the ultimate purpose was for development. Though their educational curriculum were devoid of technical skill/acquisition, it achieved the objective of the time, which was development of administrative and commercial strategies. They had no intention of building industries in the colonies; so the question of developing local technical manpower was uncalled for. Nevertheless, as technology was becoming the determinant of cultural and industrial progress, they did not hesitate to open nuclei of technical institutions in the colonies.

Historical Background of Technical/Vocational Education Curriculum

Before the introduction of western education to Nigeria, there was indigenous system of vocational education. According to fafunwa (1974, p.30) the aim of education in traditional society is character-training and job-training and job-orientation". The traditional vocation were divided into there group, viz **Agricultural education**: for example farming, fishing and veterinary science.
Trade and crafts: for example weaving (baskets and cloths), smithing (iron silver, gold etc), carpentry, building and so on.
Professions: for example doctors, priests, etc. vocational training in traditional society is largely more on the apprenticeship system and is a time –honoured device for educating million of African youths and adults.

The usual way it was being operated was that children were not trained by their parent but by relatives, master craft men in particular fields or friends in order to instill discipline and ensure concentration. As reported by Fafunwa (1974), Archibald Callaway, authority on the Nigeria apprenticeship system aptly describe it thus: This vast apprenceship training system began as a part of wider education process in which the indigenous society of Nigeria passed their cultural heritage one generation to the next. The skills "owned" by a family were highly valued. Crafts varied according to the area, but included mat-making, building of houses, leather work, black smithing and gold smithing, etc.

Unfortunately the traditional technical and vocational education did not receive an appreciable welcome from our colonial masters who introduced western literary education without technology. As Fafunwa (1974) would put it. "Technical education had a slow start and develop less quickly than other forms of education in Nigeria. This was partly due to the fact that the voluntary agencies which pioneered western education in Nigeria were unable to increase or popularize technical and vocational education on the same scale as literary education because technical and vocational education is much more expansive in terms of staff and equipment". From the above fact we can agree that the low priority accorded the technical and vocational education in Nigeria by our colonial masters (in failing to introduce the programme into the school curriculum at the post-primary level) contributed immensely to the delay in technological development of our nation. Consequently, we still found ourselves on this low level of technological development today because our leaders who took over from the colonial masters continued with the same idea of not popularizing technical and vocational educational the same scale as literary education.

The establishment of training courses in the various government departments, for example, Nigerian Railway, Marine, Public works etc; between 1908 and 1935 marked the beginning of

organized technical and vocational education in Nigeria. This brought about the first major recommendation for the introduction of technical and vocational education which was made in 1945 when the commission on Higher Education in West Africa proposed that "the premises of the defunct Yaba higher college should be converted into technical institute'.

Between 1956 and 1960 several technical and vocational schools were built in various parts of the country. These schools were offering courses in civil engineering, mechanical engineering, electrical engineering, wood work, motor vehicle maintenance, painting, welding, etc; leading to the intermediate examinations of the appropriate British professional bodies particularly the City and Guilds Institute of London (C&G). The City and Guilds of London Institute was later changed to WAEC City and Guilds with the following courses among others: Mechanical engineering craft, electrical installation, motor vehicle mechanics, building, carpentry and joinery, radio, television and electronics.

From WAEC City and Guilds it was changed to WAEC technical. The reviewed curriculum includes the following courses: Vehicles body building, electrical engineering, mechanical engineering craft practice parts I and II, bricklaying, furniture craft practice, machine wood working etc.

In continuation of these changes which has been moving the curriculum over the years, the federal government in 1995 introduced the National Technical Certificate (NTC) and the National Business Certificate(NBC) which replaced the WAEC Technical and WAEC Business Examinations respectively. The National Technical Certificate (NTC) examination are based on both the National Board for Technical Education (NBTE) curricula and the modified WAEC Technical syllabus. For example, mechanical engineering craft practice, electrical installation and maintenance practice, refrigeration, and air-conditioning, bricklaying, block laying and concrete work, carpentry and joinery, electrical engineering and practice, etc. From the forgoing, we can see that the curriculum was just being moved along for the purpose of certificating the students. But no viable curriculum has been innovated to revive and sustain the interests of the young ones to take to technical education. According to Saul (1970), "An up-to-date technology, with a continuing capacity to promote and accept technical change, is the essential hall-mark of a modern economy and most important single agency in effecting higher productivity. Hence, effectively diffusing modern technology to developing countries, and promoting their capacity for absorbing it, is crucial if they, like the present advanced economies in earlier generation and to break out of a prison of poverty and standard of manual labour penal to the point of servitude. For leader economies' processes of invention, innovation, and the diffusion of techniques (the lags associated with the latter process being reflected in the gap between best-practice technology and average technology in an industry can only be understood in terms of the fundamental characteristics of the economies concerned. Innovation though desired is fraught with problems normally associated with change. This is because generally man is resistant to change due to fear of uncertainties. Nonetheless, it is worthwhile venture in the educational enterprise. In short, innovation is a necessity in all human endeavours aimed at bringing about improvement in the existing practice.

Garba (1994) opined that curriculum innovation is not restricted to the curriculum content only; teaching strategies is also affected. The course structure and content in most of the technical institutions are not the most ideal for our circumstances. Most of them rely on model based on foreign environments where the trainees grow up surrounded by various marvels of technology. He does not need to strain his imagination to conceive of a crank shaft. But our students must be told what a screw-driver is.

One of the greatest needs of this great nation of ours – Nigeria, today, is to have industrial, technological and economic independence. There is a great need for changing the course structure and content in most of the technical education curriculum, to reflect the most ideal courses that are relevant to the Nigerian societies. And adequate arrangement should be made to teach the courses rather than printing them on the pages of papers.

Generally in education the curriculum continuously evolves in response to economic, technological, social and political changes. Thus, old courses are frequently withdrawn or modified and new courses are introduced as the needs of the students and society change.

Let us now look at some of the technologies that are relevant to our society that can be introduced into the technical education curriculum to enhance technological development of the

nation. They include such trades as: Bicycle repair, motor cycle mechanics lock and key, watch repair, torch light repair, shoemaker, stove repair eye goggle production and so on.

The Role of Technical Education in Nigeria

Technical education should not be seen as only that acquired from the traditional colleges. Similar education is obtainable from departmental schools, workshops, planned on-the-job training, seminars, industrial attachments and various part-time and sand-which technical courses. Example of such facilities abound and include the Public Works Department (P.W.D) schools, the Nigerian Railway Corporation Training School, the Civil Aviation Training School, Post–and-Telegraph (PT) Training School, the Petroleum Institute, the Water Resources Institute, Textile Workers Training School, the Federal Survey School, the Metallurgical Training Institute (M.T.I), the Marine Engineering Training Centre, the Federal Staff Training Centre, etc. their names suggest what specialized training they provide. Before all these there had existed the Yaba Higher college established in 1984 which had been able to produce high level manpower in engineering, technology medicine, agriculture, pharmacy, surveying and forestry (Fafunwa, 1974). The National Policy on Education (1998) spells out the aims of technical education to include.

1. providing trained manpower in applied science, technology and commerce, particularly at sub-professional grades,
2. providing the technical knowledge and vocational skills necessary for agricultural, industrial, commercial and economic development,
3. providing people who can apply scientific knowledge to the improvement and solution of environmental problems for the use and convenience of man,
4. giving an introduction to professional studies in engineering and other technologies,
5. giving training and imparting the necessary skills leading to the production of craftsmen, technicians and other skilled personnel who would be enterprising and self-reliant,
6. enabling young men and women have an intelligent understanding of the increasing complexity of technology.

While the aims are laudable and ambitious, its statements tend to be underrating and demonstrative of the conservative colonial mentality that technical education must continue to be pre-technical, prevocational and sub-professional in content. There is no aspect of human activities today that has no technical orientation and complexity. Even religious worshipping today demands high technology as seen in the modern designs and construction of churches and mosques. The role of technical education graduates in design, construction and operation of our industries, including oil, agriculture, forestry petro-chemical, mineral and water resources, electrical power generation and distribution, constructions, textile, iron and steel, automotive and plastics; as well as in health technology, environmental designs, armament, commercial enterprises and in teaching, are evidences of the invaluable role of technical education in national development. Perhaps the role of technical education in national development may be more appropriately illustrated by citing an instance of such roles. It can be recalled that after the Nigerian independence in 1960, many dreams were conceived of possible short-cut to economic development, among which were explosion of crude oil exploration and discovery, mechanization of agriculture, exploration of iron and steel, discovery of gold deposits, and indigenization of all technological manpower for execution of the planned projects. By the year 1970 the idea of iron ore exploration had truly materialized.

Geology graduates from Nigerian universities were employed to work along with contracted Russian experts. Their work inspired the need for establishment of iron and steel factories. The objectives of the iron and steel project were:

1. indigenous production of all construction steel inputs, with the exception of heavy structures, by the year 1985,
2. initial foreign technical assistance in plant operation and maintenance and with gradual deletion of such foreign assistance,
3. inclusion of large facilities for spare parts manufacture as a first step to total equipment production,
4. development of incremental capability for plant construction and steel project execution institutions providing course offerings in the relevant disciplines.

Self-Reliance as an Indispensable Element in National Development

We often erroneously think that development and civilization are two different things. This is because we look at a few physical structures and conclude that these are evidence of development, whereas the percentage of persons who own such structures is very insignificant.

Suppose in a given hamlet of population of 1000 inhabitants there are two magnificent houses owned by two respective individuals, each of which more looks sophisticated than the Kaduna Boat House. One might look at then and say that the hamlet is developed. But suppose the owners imported all the materials for the building and contracted all the construction and finishing trim from distant cities. And suppose also that seen sitting daily at the gates of these buildings are the rest 998 inhabitants begging alms from numerous very important persons (V.I.Ps) who visit the two socio-economic giants. Would one rightly conclude that the given area is developed? The situation can be compared to a nation where most citizens are abjectly poor, illiterate, and lacking technical know-how.

If most citizens are not self-reliant the nation cannot be said to be developed. Self-reliance depends on the degree of gainful occupations. Self-employment, technical expertise and expert consultancy services available to the individuals, both in the public and private sectors. This is the aim of the federal government in introducing the Introductory Technology in the Secondary Schools to enable most youth acquire exploratory technical skills (National Policy on Education., 1981).

Problems Confronting Technical Education in Nigeria

It is no always correct to say that the only problem confronting technological advancement in Africa is the colonial mentality which is biased against science and technical education. A complementary problem is the poor status of the producer and the receiver of the technical education. We can ask what is the good of any system of education if it does not help the individual who possesses it in solving most of his immediate personal problems, or worse still, if all it does is to make worse off as if he has had no specialized education at all (Nwosu, 1972). Though technical colleges have been established by both federal and state governments, vocational training centres built by governments, individuals and organisations, polytechnics and similar institutions established in all states, yet technical teachers are in acute shortage. This is because there are not commensurate incentives to attract and retain technical teachers. This is an overlooked serious impediment to national development. We talk of manpower development but often tend to forget that there must be manpower to create and develop the manpower. The educational institution is the brood-house and the hatchery of culture and technology for national development. If the socio-economic status of the technical teacher does not compare favourably, with, if not exceed, those of his counterparts who are in administration or business, then he cannot confidently make researches, invent and innovate ideas, or give the best of what he has to the learner. If the teacher is destitute, then knowledge is devoid and, of course, development becomes derisory.

According to Okafor (1984), if there is one strand of behaviour discernible through the fabric of western progress and developmental policy it is the encouragement of and handsome remuneration of excellence, scholarship and concomitant creativity and invention which lacks in Africa.

Conclusion

From the foregoing discussions we can infer with consideration optimism that technical education is an aggregate of all the educational processes given and acquired in school and out of school which endow individuals with creative and practical efficiency and competence, to enable them contribute to the technological development of the nation. The contribution of an individual is a unit in national development, and the magnitude and efficacy of the individuals contribution is dependent on the quality of technical education received. Such education must be one that inculcates problem identification, calculated decision-making, practical application of scientific and technical know-how in problem solving, and precision in production of equipment and tools. The individual must see himself as an integral part of the total development. In other words, technical education is the principal instrument by which all modern national and international development can be attained. Government investment in technical education at all levels of the nation's educational system is the wisest step towards true economic and technological emancipation which today's world demands. Political power depends on economic power and economic power in turn depends on

technological power which is a function of the degree of technical education a nation can afford for her citizens. In this wise, despite our virtual inconsistencies and apparent misplacement of priorities, Nigeria cannot be said to be doing too badly.

Recommendations

1. Inspite of the current global and national economic melt down, as we are told, and the consequent decline in Nigeria's monetary value, the federal and state governments should still afford to spend the greater proportion of revenue allocations on technical training both at home and abroad. The 100% localization of the Technical Teacher Training Programme (T.T.T.P) is not necessary because technology changes and Nigeria cannot claim to have known it all. About 40% the programme should still be attainable abroad. Whatever is spent on this venture can be justified by the end result.
2. A federal commission to be independent of the National Board for Technical Education (NBTE) should be constituted to monitor the performance and input of technical education products in commerce and industry with the aim of determining the effectiveness of all technical education programmes on which the government invests huge amount of money.
3. Fund allocation to institutions of technology should be based on quality and effectiveness of the programmes and their products rather than on equality of rights or pro-rata formula.
4. Remunerations of technical professionals, especially technical teachers, should be enhanced to par with or exceed those of their counterparts in other professional occupations.
5. The curriculum content should be structured to address the needs of the environment and should be more practically based. Each state can be supported to native technical education policy to meets the needs of the state. Curriculum review can be done. Planning should be given adequate time for the incubation of ideas and when possible proposal should be pilot-tested before actual implementation.
6. Federal government should allow local technicians modify ideas to suit their needs.

References

Datol, I.G.; Danwanzan, E.G.; Nyapson, C.G.; Padung, L.L.; Udah, M.P.; Bentu, S & Okwori, R. (2004): *Fundamentals of Vocational Technical Education. Implication for government funding.* In A.C Chukwu, Wd Lukden and D.C. Bulus, Jos; Matchers publishers 163 -173.

Eze, T.I. (1987). The focus on dynamics of technology programmes in Nigeria Universities. *Journal of curriculum and instruction* 2 (1&2).

Fafunwa, A.B. (1974). *History of Education in Nigeria*. London: George Allen & Unwin Ltd.

Federal Republic of Nigeria (1969). *A philosophy for Nigeria Education: Report of the National Curriculum Conference.* Lagos: Federal Ministry of Education.

Inuwa, Magaji M., (1988). Status of iron and steel development in Nigeria: Implication for local technology development. A paper presented at the Annual National Conference of Industrial Training Fund, held at Kano, 1st – 4th November 1988.

Federal Republic of Nigeria, (1981) *National policy on education.* Lagos: Federal Ministry of Information and Printing Division.

Nwosu, S.N. (1972). The role of the teacher and education in a developing nation. A lead paper presented at a national conference organized by the Faculty of Education. University of Nigeria, Nsukka.

Okafor, F.C. (1984). *Philosophy of education and third world perspective*. Enugu: Star Publishing Company.

Onosode, G.O. (1993). Regrets of 2% Education Levy. *Research and industry news*, 6, Vol.2. June/July

Peter, H.W. (1963). Guidelines in the process of change. UN conference paper on application of science and technology held at Geneva, February.

Taiwo, C.O. (1980) *The Nigerian education system: Past, present and future*. Lagos: Thomas Nelson (Nigeria) Ltd.

ASSESSMENT OF TECHNICAL COMPETENCE NEED OF INTRODUCTORY TECHNOLOGY TEACHERS IN JUNIOR SECONDARY SCHOOLS IN ADAMWA STATE

Stephen Zira Kumazhege and Wada Bitrus Zira

Abstract

This Study was conducted to assess the technical competency needs of Introductory Technology teachers in Adamawa State of Nigeria. The technical competency needs assessed in this study were the technical teaching skill acquired as well as required. The population for this study consisted of 201 Introductory Technology teachers in 174 Government Secondary Schools within Adamawa State. A sample of 60 teachers was used for the study. A structured questionnaire titled Teacher competence Questionnaire was used for data collection. 53 questionnaires were returned out of the 60 distributed out of which one was invalid. The study reveled that: Introductory Technology Teachers in Adamawa State have deficiencies in various aspects of Introductory Technology, they need further training in various aspects of Introductory Technology, most of the Introductory Technology teachers in Adamawa State have acquired technical skills in one or two aspect of Introductory Technology, all the Introductory Technology teachers in Adamawa State agreed that they need refresher courses and in-service retraining to be properly grounded in other areas so as to have a broad-based training in all aspects of Introductory Technology.

Introduction

The 6-3-3-4 system of education emphasizes introduction to the rudiments of technology at the junior level of secondary school. It is expected that children that have passed through this level of education will acquire a broad-based knowledge of technical skills. This is to make them have a wide range of career choices to make. Introductory technology is the subject that integrates modules of metal work, electrical electronics work, wood work, building construction work, auto mechanics, metal work, ceramic and technical drawing. According to the Federal Republic of Nigeria (2004), the objectives of introductory technology are; introduction into world of technology and appreciation of technology towards interest arousal and choice of a vocation at the end of junior secondary school and professionalism later in life. Others are; acquiring technical skills, exposing students to career awareness by exploring usable options in the world of work and enabling youths to have an intelligent understanding of the increasing complexity of technology.

After the introduction of introductory technology, with these laudable objectives twenty-nine years ago, one expects that there should have been a better story about the quality of vocational technical education in Nigeria today. Unfortunately, for quite some times now many informed persons within and outside the education industry have expressed their uneasiness over the problem of the falling standard and quality of technical education in Nigeria (Fubara, 1998). He further lamented that most pupils can hardly define what they are really up to in life.

The success of any educational programme hinges on the ability of teachers to implement it. This is why the government has established training institutions and suitable proggrammes for the production of teaching manpower needed for the implementation of the 6-3-3-4 system of education. Introductory technology, which is one of the core pre-vocational subjects introduced in the system, needs a serious attention, in view of its importance. Today people are not talking just of education, but functional education that enable children to use their heads and hands in a creative way that leads to self-reliant and promotes fast technological development.

Considering the multifarious nature of introductory technology, teachers that are to handle this aspect of junior secondary school curriculum should also be trained to cope with the challenges of the subject. All prospective introductory technology teachers need to keep abreast with the content of the subject. However most of the introductory technology teachers are skilled or knowledgeable in one area of introductory technology or the other; and so that is the manner in which the subject is being handled at the moment in the junior secondary schools of Adamawa State. It is assumed that

most of the introductory technology teachers do not possess adequate training background for teaching the subject.

Statement of the Problem

There has been poor performance of students at junior secondary certificate examination JSCE level in Adamawa State. The problem of this study therefore is to assess the technical needs of introductory technology teachers currently handling the subject in Adamawa state junior secondary schools. To ascertain its effect on students performance in the subject at the JSCE level.

Purpose of the Study

The purpose of the study was to assess the technical competency needs of introductory technology teachers in Adamawa State secondary schools. Specifically the study was to:

1. Ascertain the training background of introductory technology teachers in Adamawa State Junior secondary schools.
2. Identify technical skills possessed by introductory technology teachers in Adamawa State Junior secondary schools.
3. Identify additional technical skills required by introductory technology teachers in Adamawa State Junior secondary schools.

Research Questions

1. What training background does introductory technology teachers in Adamawa State Junior secondary schools posses?
2. What are the technical skills acquired by Adamawa State introductory technology teachers during their training?
3. What technical skill(s) does introductory technology teachers in Adamawa State Junior secondary schools require for the successful execution of their jobs?

Method

This study employed the use of descriptive survey research design. This is because the researcher is only interested in observing the nature of the sample subjects without any attempt to manipulate or control them (Asika, 1991). The area of the study was Adamawa state of Nigeria. The study covered the five educational zones of the state, namely; Mubi, Gombi,Yola, Numan and Ganye zone. It was mainly on the assessment of the technical competency needs of introductory technology teachers for the successful execution of their jobs. The population for the study was 201 introductory technology teachers serving in government secondary schools in Adamawa state of Nigeria as at 2007/2008 school year. Table 1 presents the number of government secondary schools offering introductory technology and the teachers in the respective five zones.

Table 1.

Number of Government Secondary Schools Offering Introductory Technology and Teachers in the Five Educational Zones of Adamawa State 2007/2008 School Year.

Zone	No of schools Offering intro.tech.	No of schools Selected	No of intro. tech. Teachers	No of teachers selected
Mubi	39	12	44	13
Gombi	44	13	54	16
Yola	27	8	30	9
Numan	36	11	40	12
Ganye	28	8	33	10
Total	174	52	201	60

Source: Adamawa State PPSMB Statistic Department number of schools/staff by zone (2008)

A stratified random sampling sampling technique was used for the study. The strata were the five educational zones, namely; Mubi, Gombi, Yola, Numan and Ganye. The sample selected from each zone was proportional to their number of occurrence in the population. 30 per cent of the total schools and teachers were randomly selected from each stratum. According to Asika (1991), and

Toluhi (2001), even when 10 per cent of the population is used, is sufficient for a study. Thus the sample for this study was made up of 60 introductory technology teachers drown from 52 government secondary schools in Adamawa State.

The instrument for the study was a structured questionnaire, developed by the researcher according to the specific purposes and research questions. The scoring scale of the instrument was meant to elicit the respondents' level of agreement on the listed items in the instrument. Face validity was established for the instrument. Five experts from Technology Education Department, Federal University of Technology Yola were requested to appraise the content, language, relevance and adequacy of the items on the questionnaire. Their comments and suggestions were considered for improving the quality of the instrument. A pilot study was carried out in five government secondary schools in Askira-Uba local government area of Borno State to determine the reliability of the instrument. The split-half technique was adopted. The reliability coefficient of the whole test yielded a correlation coefficient of 0.66 for the respondents' extent of agreement to the listed items concerning their training. The information collected by the researcher was analysed using percentage.

Findings

The findings of the study reveal the following:

1. Most of the introductory technology teachers in Adamawa State Secondary Schools have the Nigeria Certificate in Education (NCE) Technical training background. Coming closely the NCE is the degree training background. A few of the introductory technology teachers either have C&G, OND, TTC or HND as their training background respectively.
2. Most of the introductory technology teachers in Adamawa state secondary schools have acquired technical skills in one or two aspect of introductory technology.
3. The introductory technology teachers in Adamawa state secondary schools require training in various aspects of introductory technology.
4. More than half of the introductory technology teachers require practical training in most of the areas of introductory technology and in the concept of welding and auto mechanics.
5. Introductory technology teachers in Adamawa State secondary schools have passed through a period of general training in various technical areas. They also have acquired some technical skills in these areas. However they have agreed that the skills they have acquired in these technical areas cannot be compared with the one they have in one particular technical area of study.
6. The period of general training in other technical areas at NCE level is not adequate to acquire the much needed technical skills in various aspects of introductory technology for effective teaching of the subject.
7. About half of the introductory technology teachers in Adamawa State secondary schools have adequate training for teaching of introductory technology in the state
8. All the introductory technology teachers in Adamawa State secondary schools have agreed that they need refresher courses and in-service training to be properly grounded in other technical areas so that they can have a broad-based training in all aspects of introductory technology.

Discussion

Introductory technology teachers in Adamawa State junior secondary schools have problems. Introductory technology has come to stay as a school subject and an integral part of the junior secondary school syllabus. Teachers of introductory technology therefore ought to be well prepared to face the challenges of the subject. Edigin (1994) observed that the complexity of introductory technology make it almost practically impossible for one teacher to handle it successfully. However, Federal Republic of Nigeria (2004), in the national policy on education stated that, the aim of introductory technology is to give the children broad knowledge in rudiments of technology to prepare them for future studies in related fields of engineering and to prepare the for a world of work. It therefore takes a broad technical knowledge and acquisition of technical skills to be an effective introductory technology teacher. Edigin (1994) said that the effective teaching of a subject could best be measured by the amount of knowledge the learner acquires as a result of the teaching learning process. In this case the teacher of introductory technology is the supplier of goods and the

learner is the consumer. It therefore means that the teacher cannot supply more than what they are taught.

The findings of this study agrees with what Ajisa (1990) observed, that in most of our schools, the number of unqualified teachers is alarming and unless government institute a drastic measures to rectify the dominance of unqualified teachers in schools, the quality of instruction will be inadequate. Laudable as this system of education with its beautiful objectives had been, it is beset with numerous problems. One of the major problems militating against its successful implementation is the ineffective teaching of introductory technology in our secondary schools. This malignant problem of unqualified introductory technology teachers though identified by all and sundry is yet to receive the desired government attention as shown in the case of Adamawa State of Nigeria.

Conclusion

Based on the finding of this study, the following conclusions are reached.

1. Introductory technology teachers in Adamawa State secondary schools need broad, adequate knowledge in technical areas and practical skills in all the technical areas
2. The teachers of introductory technology in Adamawa State government secondary schools have never been effective as a result of the number of the unqualified introductory technology teachers handling the subject.
3. The children that passed out from junior secondary schools in Adamawa State do not acquire enough technological base knowledge for self-reliance or for further studies in engineering fields due to the quality of introductory technology teachers that are in these schools. This is evident in the performance of the students in the subject, at the JSCE level.

Recommendations

Based on the findings of the study, the following recommendations are made:

1. The Adamawa state Ministry of Education in collaboration with Post Primary Schools Management Board should organize workshops and training for introductory technology teachers in the state to make up for the other areas of introductory technology in which they are deficient.
2. Introductory technology teachers in Adamawa State Junior Secondary Schools should be encouraged to go for further training through in-service in the Universities of technology where they can acquire both theoretical and practical skills needed to teach all the areas of introductory technology.

References

Adamawa State PPSMB Statistic Department, (2008). *Statistics of schools/staff* according to zone

Ajisa, M.O. (1990). Secondary education, *Journal of college of education Agbor* 1 (3), 11.

Asika, N. (1991). Research methodology in behavioral science. Lagos Longman Nigeria PLC.

Edigin, J.O.D. (1994). Teaching of introductory technology in secondary schools: A problematic venture. The Nigeria teacher today, *A Journal of Teacher Education* 3 (1&2), 135-140

Federal Republic of Nigeria, (2004). *National policy on education*, NERDC Lagos.

Fubara, V.N. (1998). The falling standard of education; Implication for the Nigerian child in the twentieth century. *GOBARAU Journal of Education*, 2 (1), 75- 82

Toluhi, J.O. (2001). Fundamentals of research methodology, Ilorin, Nigeria: Victory Publications.

A THREE LEVEL APPROACH FOR EXPLORING THE ICT IMPACT ON THE BUILDING DESIGN PROCESS.

Arch. Lawal K. Omotoso

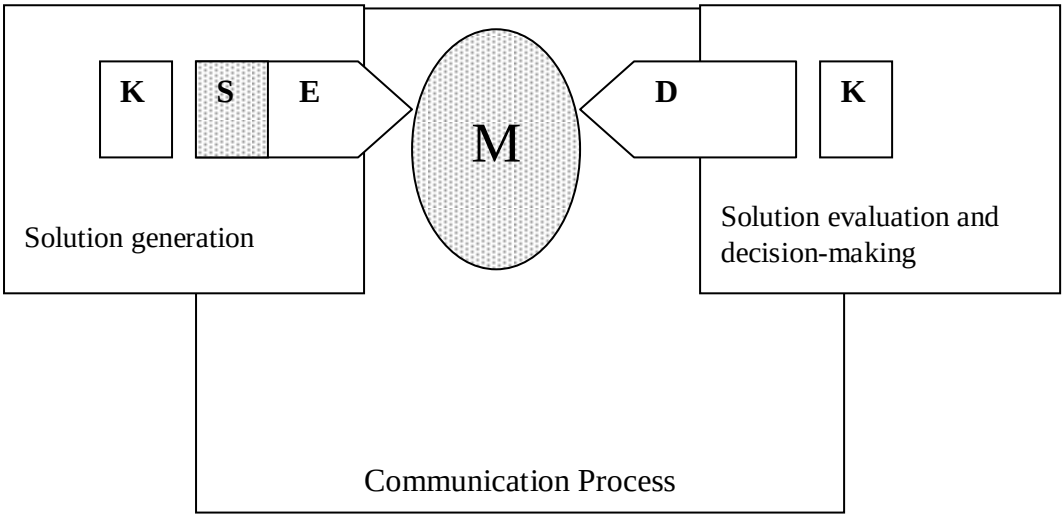
Abstract

The success of a building project is a function of a good design process. Over the years, the impact of ICT has led to dramatic changes within the construction industry. An understanding of how ICT influence on the building design process and the architects' role and contribution within it can be crucial for the building project success. This paper introduces a possible approach of organizing and structuring design process, actions and roles and how ICT impact on them. This approach is based on the definition of three building project levels and how they could contribute to a better overview of how ICT impact on the building design process. The aim of this paper is to illustrate how this approach can be used to explore the impact on a real life project. It concluded by recommending the development of user interface in IT code with various appropriate ICT tools for all stakeholders in building industry for a better productivity.

Introduction

A fundamental pillar of a successful building project is a good design process. The future and development of a good architectural design solution depends on complex and iterative processes on several levels and with different actors. Over the years, the ICT impact has led to dramatic changes within the construction sector average working day, especially the network technologies such as internet and e-mails, and the development of advanced visualization and CAD systems, such as virtual reality and building information models (BIM) have had and will further have an impact on both processes and role definitions (Wikforss, 2003). The participants within the building design process face ICT related benefits and challenges at several levels. The architect has a distinct and important role within the building design process (Gray and Huges,2001). His skills makes him adaptable for several roles from being a design specialist, translating the many project constraints into physical form, to being a design generalist, leading, coordinating and administrating the design process as the building design-or even the project manager. An understanding of how ICT impacts the building design process and the architect's role and contribution within it can be crucial for ensuring building project success, due to quality, time and cost.

This paper introduces a possible approach of organizing and structuring design process actions and roles, and how ICT impact them. This approach is based on the recognition of three levels within a building project. The intention behind this approach is not to force aspects of the complex architectural design into rigid categories; rather it aims to contribute to a better overview of how ICT impact on the building design process in general and on the architect's role and contribution in particular. The paper focuses on four essential aspects of the design process: the generation of design solutions, the communication, and the evaluation of design solutions and the decision-making. These four aspects are highly interdependent and iterative, as figure 1 sees to illustrate. The illustration is among others based on Kalay's description of the communication process (Kalay, 2004).



K = Knowledge, S = Sender, E = Encode, M = Message, D=Decode, R = Receive
Fig. 1. Illustration of the relationship between the four selected architectural design aspects.

The first outline of the three-level approach is based on the exploration of recent literature and research within the area. The aim of this paper is to illustrate how this approach can be used to explore the ICT impact on a real-life project. This paper and the three-level approach contribute to a framework for further inquiry about the relation between ICT and the architect's role and contribution within the building design process.

Introducing the Three-Level-Approach

Three levels of operations and actions can eventually be recognized within the building design process. As a first overview of the three levels: the micro-level comprises individual and cognitive processes, based on what is going on in the head of the individual. The meso-level covers the mechanisms within a group and the macro-level comprises the mechanisms on overall organizational or sector level.

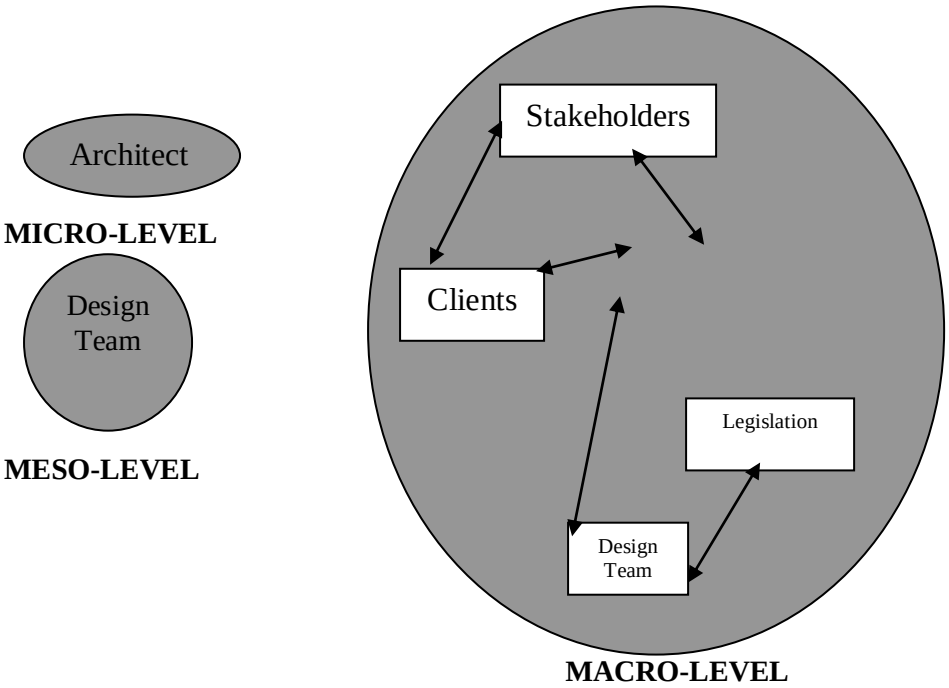


Figure 2: Illustration of the three levels within a building project

Different types of theories, as for instance individual theories (micro-level), group theories (meso-level), and organizational theories (macro-level) can be used to illustrate the processes on the different levels.

Many individuals are involved in a building project each communicating, making decisions and taking actions based on 'something going on in their head'. Each of these individuals is himself a micro-level, as the client, the architect, the mechanical consultant and the manufacturer. However, at the same time, every individual operates within one or several contexts. The client is an individual operating within his own organization (meso-level) and within the overall project context (macro-level). The three-level-approach could thus be applied on different situations with focus on different individuals. The chosen individual can be the filter for defining the other levels. In this case, the chosen individual and the filter is the architect. Thus, in this paper, the micro-level is illustrated by the individual architect generating his ideas, the meso-level by the design team in which the architect interacts and the macro-level by the overall building project context and frame around the design process.

The architect could be seen to have different roles and contributions on the different levels. The creative processes in the head of the individual architect take place on a micro-level. Within a meso-level context or the design team, the architect has to interact with other designers and consultants, as a design specialist and a hierarchical equal participant, or as a design generalist with responsibilities within coordination and leading of the group. On the macro-level, the role and 'visibility' of the architect depends on his function on the two other levels.

In an unpublished paper written for the CIB symposium 'Combining Forces' in June 2005, a literature based on exploring of ICT related benefits and challenges within four essential aspects of the design process: the generation of design solutions, the communication, the evaluation of design solutions and the decision-making, was presented. An ICT impact matrix, based on the three-level approach, was introduced as a frame for summarizing and gaining overview of the theoretical topic explored (Moum, 2005).

The Micro-Level

The micro-level is in this paper illustrated by the architect's individual development of design solutions. According to Lawson (1997), the design process is a simultaneous learning about the nature of the problem and the range of the possible solutions with no clear distinction between problem and solution, analysis, synthesis or evaluation in the design process. The designer juggles with several ideas at the same time without forcing a premature precision or decision. Schon (1991) described the design practice (e.g sketching) as a conversation or reflective dialogue between the designer and the design situation or design issue. The designer conversation with the design situation allows a fluid thinking process without constraints like disturbing accuracy. The designer's conversation with the drawing or what Kalay (2004) calls ideation or an intra-process role of communication are examples of micro processes.

Figure 3: How do ICT impact on Micro-level?

The Meso-Level

The group processes within the design team illustrate actions on the meso-level heavily based on collaboration and communication, taking into account different constraints set for the project which leads to the primary idea develops within a group context into something that can become the conceptual fundamental of the building project.

The importance of collaboration is growing, as globalization and increasingly complex technique and products require more teamwork, and the complexity of the problem becomes unmanageable for one individual. Barrow, (2000) introduces the term Cybernetic Architecture, which he explains as a 'collective body; body of knowledge and specialty skills found in many individuals. The focus changes from the individual to the collaborative design process and this introduces a challenging dimension in the idea finding process: the interaction between the individual and the group Lawson (1997).

Successful teamwork is among others based on shared understanding. If the group participants have similar background and a common base of experiences, with the opportunity to learn about each other over time, to communicate, share information and to develop a team spirit, this will be ideal conditions to ensure a shared understanding of goals and tasks (Hinds and Weisband, 2003). Within a design team, much of these will not be the case. The actors come from different companies and organizations, have different interests and experiences, have often never worked together before and will perhaps never work together again. However, the project team consisting of specialists with different competencies, as architects and consultants, has a long tradition, especially by middle-sized and large projects. Hence, handling team processes and communication is nothing new for the building process participants. The degree of shared understanding as the basis for a good teamwork can on the one hand be seen to depend on the skills of the manager, such as the facilitating and monitoring of the information exchange and interpretation (Cramton & Orvis, 2003). On the other hand, the informal 'rules' of how to structure the building process, partly defined in different professional guideline as the German HOAI (Honorarordnung fur Ariteten und Ingenieure) or the Norwegian AY (Aritetytelser), contributes to establish routines and an understanding of the work to be done.

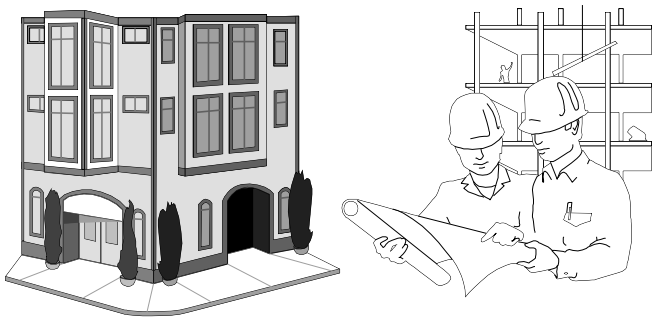


Figure 4: How do ICT impact on meso-level and the architect's role and contribution within it?

ICT Impact at Meso Level

Decisions made at the early stage of a product development process, the design process, have severe influences on the quality of the product (Cohen, 1995). This is a common phenomenon of projects in any domain including the building sector because design is a decision instrument to express product features and production information (Boveret and BFR, 1994) and (Formoso et al., 1998) .To improve the design process performance, numerous initiatives have been taken including the partnering concept with its focus on stimulating collaboration amongst the stakeholders from the beginning of a project.

Establishing shared value particularly in the context of project related knowledge tends to improve collaboration amongst stakeholders and therefore allow them to make fast and accurate decisions at the early stage of design in order to reduce the potential negative costly impact on the later stages.

Developing a mechanism to manipulate (capture, store, search, retrieve) knowledge generated from experiences has been of interest since the realization that people and knowledge are the

most important strategic resources of an organization (Fruchter, 2002). The fast developing information and communication technology (ICT) tends to expedite the research progress in this area by contributing ICT tools that comprises collaborative features such as co-editing, co-browsing, etc. systems enhanced with technology as such have been used by various professional domains, including the building sector, tempting to manage the existing information base among design team.

Problem Definition and ICT Solution

The early stage of a building project is usually referred to as activities that start from client briefing to conceptual design and are inherently iterative. Data and information generated at this stage such as briefing notes and sketches are mainly informal and not well structured but important to reflect the tacit design knowledge and possibly documented as design rationale. Such weakly structured information is not less important than the structured one such as the final drawings and reports that are generated at the end of every meeting. Likewise the tacit and explicit knowledge (Nonaka and Takeuichi, 1995). It is an uneasy task to integrate both the weakly –and-well-structured information from the perspective of traditional knowledge management (Fensel et al 2002).

The building industry is very project-oriented in nature and it is organized on actor streams wherein actors are involved in several projects at the same time (Zarli et al, 2002). Actors involved in the same project are sometimes thousand miles apart and practicing different working methods in accordance with their respective roles. In addition, most projects can be characterized as virtual organizations that are only established for the duration of a contract with temporary and often short-term business relationships (Zarli et al., 2002). All of these factors have created the dilemma upon the building sector that extra resources are required respectively to manage each project. Consequently, the project related machine stored knowledge would no longer be contained in one centralized repository but distributed in heterogeneous databases that belong to different individuals, discipline groups, project teams and organizations. Even though the concurrent ICT enables the formation of virtual project team that can work across geographical and time constraints through virtual workspaces integrating the heterogeneous information sources particularly ones that contain weakly structured information remain an uneasy task in the building sector. The widely use of low-level technologies mostly adhering to hyperlinks and keywords search (Ding et al., 2003) and lack of Meta level data structures (Christianson, 1998) is the main reason behind this non-integrating phenomenon.

The Macro-Level

The design team is a part of an overall context, the macro-level. The building project comprises many organizations, representing different interests. The client organization, the users, the building authorities and the contractors are some of the actors, which establish the overall building project frame and the constraints and requirements influencing the design process. Decisions are made on all three levels. The architect will on the micro-level make his decisions about which design solutions are worth being put on the paper. But on the macro-level the client will be responsible for the crucial decisions regarding which proposed concept should be developed further.

There are several challenges due to decision-making within the field of architecture. The building design process is in addition to the measurable, quantitative and conscious based on the qualitative, intuitive and tacit (Kiviniemi, 2004), (Lawson, 1997). Explicit knowledge can be articulated and is thus accessible to others while tacit knowledge cannot be articulated (Griffith et al., 2003). Wittgenstein's language game theory is one illustration of this problem area (Lundequist,1992). The crucial question within evaluation of design solutions is how to measure or judge the qualitative, tacit and intuitive aspects? "Is it possible to say that one design is better than another and, if so, by how much?" (Lawson, 1997), p.62. The client's understanding of the qualitative aspects depends essentially on the communicative skills of the architect and the design team.

Failed communication can cause conflicts and misunderstandings, negatively influencing the building project if not recognized and solved at an early stage. As illustrated in figure 1, the sending and receiving of a message (e.g design solution) depends on the competence, knowledge and previous experiences of the participants in the communication process. The architect must encode the design solution in the form of some symbolic language, which is then transmitted, through a suitable medium (e.g paper drawing scale 1:100), to the client, which must decode the design solution to understand it. Both the client and the architect decode and encode information based on their knowledge, or

frame of reference Kalay, (2005). If the client does not know the symbolic meaning, or what level of abstraction used, he will not understand what the architect or the design team tries to communicate.

These were some theoretical key points related to each of the three levels, which seem to inherit different challenges and difficulties to be handled. Processes and actions on all three levels could be seen to impact on the successful design process and the generation and development of good design ideas.

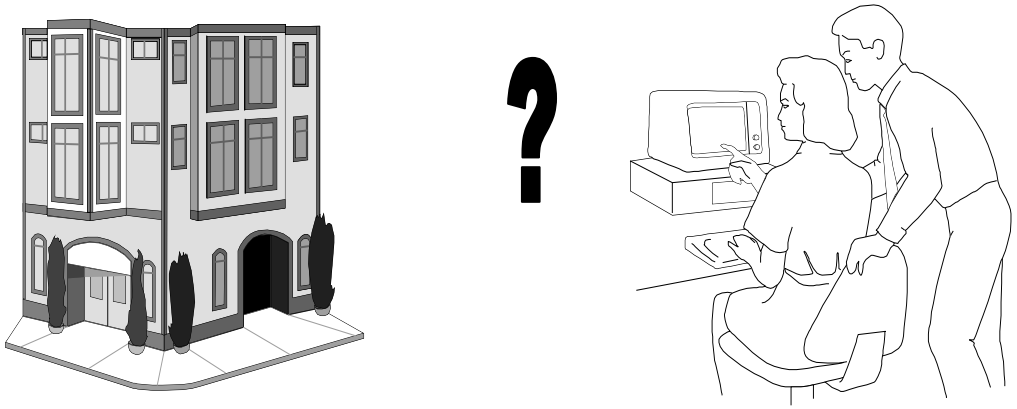


Figure 5: How do ICT impact on macro-level and the architect's role and contribution within it?

Semantic Web in the Building Sector-A Pedestal of ICT Impact at Macro-Level

To maintain its competitiveness, the building sector must progress in parallel with the e-commerce sector to face the challenges of paradigm shift with respect to the use of the innovative ICT as well as the strategy of ontologies. To date, the favourable collaboration ICT tools in the building sector are the project extranets (project websites), workflow management tools and groupware application for collaborative working.

Project extranet builds on client-server and web browser technology to enable distributed project team members to share, view and comment on project-relevant information. This tool is still widely implemented though limitations from its purely document-centric characteristic and limited workflow support have been identified. To overcome the limitations of project extranet is somehow necessary to accommodate the increase of information generated throughout the building life, in particular in the early creative design phase wherein fragmented design knowledge capture is of importance. The use of diverse professional languages impairs communication amongst stakeholders while provoking them to the possibilities of misunderstanding. After being aware of the potential impact, the building sector has taken numerous initiatives to broaden the horizon of communication capabilities that are supported by the Internet, and therefore lead to a change of paradigm.

"In this aspect several EC funded projects have been conducted to provide the building sector a stepping-stone on the path of paradigm-shift. For example, Diversity, which is a project that aims at supporting and enhancing concurrent engineering practices through allowing teams based in different geographical location to collaboratively design, test and validate shared virtual prototypes (Christiansson et al., 2002), and e-Construct, a project with the aim to improve internet-based communication in e-Commerce and e-Business, in the context of communication across national and organization barriers. Solutions for transferring and sharing knowledge across ICT systems are therefore the focus of e-Construct. To achieve the objective, a common communication-oriented language, namely the XML has been defined based on Extensible Mark-up Language (XML) with building construction meaning aimed at e-Commerce transactions (Construct, 2001). E-COGNOS, which aims at offering a generic, modular and open solution for knowledge management in the context of collaboration between actors in a construction project (e-COGNOS, 2001) started in year 2001. To summarize, the insights of these examples imply that there is an evolution tendency from the document-centric Internet to a meaning centric Semantic Web. This shift in focus may meet the

requirement of knowledge management practices in the building sector, which is mostly informal and people-centered wherein abstract concept and meaning are of interest.

Conclusion

The three-level approach is a conceptual system that aims at enhancing collaboration amongst key stakeholders in order to improve the efficiency and effectiveness of the early design process of a building project via the use of Semantic Web. Shared value build between project stakeholders supports the decision-making process, which is crucial particularly at the early design stage. Common workspace and information sources from the basis for conducting collaborative activities, and thus play a vital role in establishing shared values. The functionalities of the above-discussed Semantic Web based knowledge management system are apparently contributable to this goal. The developing prototype system provides a more user-friendly environment as all sorts of information can be annotated.

Recommendation

The following recommendations are made:

i. In view of the dilemma of knowledge management that the building sector is facing, a lightweight ontology based prototype system must be developed by Architectural firms and other stakeholders in building industry.

ii. The need to develop user interface in IT-CODE for composing more complex query in design process. The IT-CODE with various appropriate ICT tools linked will enable the creation of semi-structured information such as sketches, client requirements in digital format. IT-CODE provides a virtual meeting environment that is Internet accessible and will allow the meeting context to be recorded and efficiently reusable to provide the users with knowledge of the decision intent and rationale. The knowledge management prototype system plays the role of managing semi-structured information that is neglected by most of the conventional archive mechanism.

References

Barrow, L.R (2000): *Cybernetic Architecture, Process and Form. The Impact of Information Technology*, Doctor of Design Thesis, Harvard University, Cambridge, Massachusetts.

Boveret and BFR (1994), Building and Health, Educational Campaign for Healthy Building, National Board of Housing, Building and Planning (Boveret) Swedish Council for Building Research. (BFR), D1:1994.

Chrsitiansson, O. (2003). Next generation knowledge management systems for the construction industry. Auxccland, New Zealand, April 23-25, 2003. CIB W78 Proceedings construction IT bridging the distance, ISBN 0-908689-71-3 CIB Publication 284.

Cohen, L. (1995). *Quality function deployment: How to make QFD works for you*, Addison Wesley Publishing Company.

Cramton, C.D & Orvis, K.L (2003). Overcoming Barriers to Information Sharing in Virtual Teams. In S.G. Cohen & C.B. Gibson (eds), *Virtual teams that work, creating the conditions for virtual team effectiveness*. 214-229 San Fransisco: Jossey-Bass.

Fensel, D. (2001). Ontologies: *A Silver Bullet for knowledge Management and Electronic Management*, Springer, Berlin.

Fruchter, R. (2002). Metaphors for knowledge capture, sharing and reuse, in Proc of e-Work and e-Business in Architecture, Engineering and Construction, Turk and Scherer (eds.), ECPPM Conference 2002, pp 17-26.

Gray, C. & Hughes, W. (2001*): Building Design Management* Oxford: Butterworth Heinemann.

Griffith, T.L., Sawyer, J.E., & Neale, M.A (2003). Virtualness and knowledge in teams: Managing the love triangle of organizations, individuals and information technology. *MIS Quarterly* 27(2): 265-287.

Hinds, P.J &Weisband, S.P. (2003). Knowledge Sharing and Shared Understanding in Virtual Teams. In S.G Cohen & C.B Gibson (eds.), *Virtual teams that work, creating the conditions for Virtual Team Effectiveness*: pp. 21-36. San Francisco: Jossey-Bass.

Kalay, Y.E (2004). *Architecture's new medial principles, theories, and methods of Computer-aided design* Cambridge: MIT Press.

Kiviniemi, A. (2004). 3D Modeling in Architectural Design. Ref Type: Unpublished Work.

Lawson, B. (1997). *How* Designers Think, the Design Process Demystified (3 eds.) Oxford: Architectural Press.

Lundequist, J. (1992): Designteorins *kunskapsteoretiska utgangspunkter.* Stocholm: KTH Reprocentral.

Mounm, A. (2005). ICT and the architectural design process-introduction of an ICT impact matrix, in 11th Joint CIB International Symposium. Combining Forces- *Advancing Facilities* Management and Construction through Innovation. Ref type: Unpublished Work.

Nonnaa & Takeuichi (1995). The knowledge-creating company: How Japanese companies create the dynamic of innovations. Oxford University Press.

Schon, D.A. (1991). *The reflective practitioner how professionals in action.* Aldershot: Ashgate.

Wiforss, O. (2003). *Byggandets informationsteknologisa anvands och utvecklas IT ibyggandet.* Stockholm: Svensk byggtjanst.

Zarli, A., Kartranusschov, P., Tur, Z., Rezgui, Y., Kazi, A.S. (2002). Harmonisation of the IST research and development for the European construction industry: The ICCI project, in Proc of e-Work and e-Business in Architecture, Engineering and Construction, Turk and Scherer (eds.), ECPPM Conference 2002, pp 33-40.

ACID-BASE CONTENTS OF EDIBLE FOOD SAMPLES: FOCUS ON INQUIRY-DISCOVERY SCIENCE LEARNING F0R QUALITATVE AND FUNCTIONAL EDUCATION

Joseph O. Akpan

Abstract

This paper examines the necessity of teaching and learning science as a process of inquiry-discovery against the background of significant breakthroughs which over the centuries had been made by eminent scientists for man's benefits through the process of inquiry and discovery. Using some edible food samples in our environment, the paper shows how the acid-base contents in the samples can be probed into and by so doing inculcate in the learners the scientific attitudes of inquiry and discovery that can stimulate scientific thoughts and lead to breakthroughs. Science taught and learnt in this way is indeed qualitative and functional as breakthroughs arising from such knowledge are bound to serve the needs of the society. To achieve this, the paper recommends adequate provisions of laboratory equipment and facilities for meaningful inquiry and discovery.

Introduction

One of the seven points in the agenda of President Yar'adua-Jonathan administration is to ensure quality and functional education. This is education where excellence in both teaching and learning the skills in science and technology are ensured. The overall aim of such education is to produce scientifically and technologically literate students who will be seen as future innovators and industrialists in the country. Science, as we know, is a systematic study of nature. It has, as its components, the product and the process dimensions .The product of science deals with the facts, ideas, principles, generalizations and concepts. The process component, on the other hand, has to do with skills such as observation, classification, communication, measurement, inferring, hypothesizing, predicting, analyzing, drawing and application which must be acquired and developed for use to arrive at the product of science. According to Agbo (2000), skills are expertness, practical ability, dexterity and facility in doing something. They could also mean knowing how to use a procedure (Johnson and Wham, 1980). Process skills help the scientists to find answers to problems. Although many instructional strategies (e.g. analogy approach, concept mapping) could be used to acquire scientific knowledge, teaching and learning science as an inquiry-discovery undoubtedly encourage the development and acquisition of the process skills of science. Little wonder why the American Association for Advancement of Science (AAAS, 1965) stressed the need to teach science as a procedure of inquiry since science is more than a body of facts or collection of principles.

It is also a well known fact that learning becomes most effective when relationships between and among variables are discovered and generalizations unfold through a planned sequence of inquiry experiences rather than through being copied or memorized.

The importance of using the process skills of inquiry/discovery approach in science teaching and learning is that even when the instruction or learning is over, the processes still remain after the many details of the contents had been forgotten(AAAS, 1965). The process skills indeed are characterized by actions and personal involvement with problems and equipment. The emphasis of Jerome Bruner, the proponent of learning by inquiry/discovery, is on the production of and manipulation of materials through what he calls enactive, iconic and symbolic stages (Ogunniyi, 1983). Literatures are replete with prominent scientists who produced and manipulated learning materials through a roller-coaster ride of successive equilibria and disequilibria until breakthroughs were attained. For instance, Benjamin Franklin who is associated with the invention of the thunder protector toyed with electric wires/plates connected to a flown kite in the sky. Though, he died in the process during a downpour with an electric spark and thunderstorms, his experience of inquiry/discovery lives on to this day. Similarly, before the mystery of the structure of DNA as a double helix was finally solved and published by Watson and Crick in a prestigious science journal called Nature, many ups and downs of inquiry/discovery were passed through (Matthews, 1993).

Equally true, the wave-particle duality of matter and radiations came to lime-light after progressive failures and successes of inquires and discoveries by eminent scientists including Isaac Newton, Albert Einstein, Arthur Compton and Thomson Young (Matthews, 1993).

Furthermore, the mystery behind the cause of AIDS that is now ravaging humanity began to unfold in 1981 as a result of the detective/inquiry works of New York and Los Angeles medical doctors on the curious increase in numbers of previously healthy young men with a rare form of pneumonia (Pneumonia carinii) and a rare form of cancer on the connective tissue (Kaposi sarcoma). When finally in 1983 HIV was isolated by Luc Montagnier and colleages in France and linked to the causes of AIDS (Matthews, 1993), the entire process progressed through scientific inquiry/discovery. Also, the identification of protons by Ernest Rutherford and neutrons by James Chadwick as the nuclear components of an atom surrounded by electrons, occurred by a steady yet rough progressive process of scientific inquiry and discovery.

It is against the backdrop of the fore-going significant breakthroughs in science via the application of the inquiry-discovery method of learning that this paper seeks to apply the approach to the study of selected edible food samples in our environment in order to illustrate how elementary science students could be made to study/learn science as an inquiry/discovery process. The overall purpose is to show how to inculcate in the students the science process skills necessary for qualitative and functional education that will stimulate national growth and development.

Experimental Procedure

Samples of edible food samples were employed to illustrate the concept. They included lime fruits, lemon fruits, grape fruits, unripe oranges, tomatoes, English apples, water melons, coconut fruit, garden eggs, sour cow milk, gruel(or kunu in local parlance) and Acorn species (or zobo in local parlance). All the samples were obtained from Zaria LGA of Kaduna state. The juice from these fruit samples was extracted by means of a grater and simple centrifuge. The juice so extracted was filtered and kept in labeled test tubes. From the coconut sample, its water (cell sap) was obtained and kept in test tube while the fruit was crushed and the juice extracted and kept also in a test tube. The cow milk obtained from a cow rearer was fermented for 3days and used as soured milk sample (or fura in local parlance). This also was kept in a test tube. The Acorn species (zobo) was soaked in water for 10minutes to extract its pigments while a freshly prepared gruel (kunu) sample was obtained from the dealers. The ‘zobo’ extract and the ‘kunu’ were kept in labeled test tubes. The readers may use extracts from available fruits/edible foods in their locality. These samples were subjected to laboratory tests and analyses using universal indicator and litmus papers/solution.

Experimental Analysis

To determine the acid or base contents or otherwise of the samples, about 10ml of each of the samples in the labeled test tubes was tapped and treated with about 2ml of the prepared universal indicator solution. A colour variation was observed and this was compared with the standard colour variation of universal indicator to determine the pH match for the samples. The samples were subsequently tested with blue and red litmus papers/solution to affirm their acidity, alkalinity or otherwise. All the various samples were tested in this way and the results are presented in Table1 as shown:

Results

Table I

Behaviour of samples with universal indicator and litmus.

Food Sample	Color variation observed with universal indicator	pH range matching with observed color	Action on litmus
Lime	Orange	2.00 - 4.50	Red
Lemon	Orange	2.00 - 4.50	Red
Grape	Orange	2.00 - 4.50	Red
Orange(ripe)	Red	0.00 - 2.00	Red
Orange(unripe)	Orange	2.00 - 4.50	Red
Tomatoes	Yellow	4.50 - 6.50	Red
English apples	Yellow	4.50 - 6.50	Red
Coconut water	Green	6.50 - 8.00	Neutral
Coconut fruit	Yellow	4.50 - 6.50	Red
Water Melon	Yellow	4.50 - 6.50	Red
Garden eggs	Green	6.50 - 8.00	Neutral
Sour milk(fura)	Orange	2.00 - 4.50	Red
Gruel (kunu)	Red	0.00 - 2.00	Red
Acorn sp(zobo)	Red	0.00 - 2.00	Red

Discussion

A universal indicator is made up of a mixture of various indicators which work at various pH ranges (Ababio, 2004). It can be used to determine the approximate pH of a solution to about ±1 unit (STAN, 1988). The colour observed for a given solution using the universal indicator is usually matched or compared to a colour chart with a pH calibration. From such matching or comparison, the pH of the solution is determined. Although the pH so determined is approximate, it gives an insight into the level of alkalinity or acidity of that solution. From the experimental study in this paper, it can be seen that majority of the food samples used are acidic (as shown by their pH values of less than 7) except garden eggs and coconut water where pH value is about 7. The litmus test further confirmed the behaviour of the samples - the acidic ones turning blue litmus red while the neutral samples produce no change on litmus.

Conclusion

Having obtained the approximate pH values of the solutions, an inquisitive learner would ask questions as to how to measure the exact pH of the solutions or what acids are actually present in the solutions and why the other solutions were neutral. He might also want to know what causes the colour of the solution samples to vary between orange or yellow or green or red with the universal indicator or what could be the consequence on the human body of consuming the food samples with such acidic contents. Such questions bothering on the "why", "how" and "what" of things and happenings constitute the essence of science (Besmart-Digbori, 2008). Attempts to answer these "why", "how" and "what" questions are likely to provoke inquiry that might result in discovery. An inquiry into the acid contents of plants and animals of various kinds and their discovery can ginger further scientific investigations into their identifications and isolation for specific purposes that can be of immense value to mankind. Learning and teaching science as an inquiry and discovery will undoubtedly make science learning relevant and functional to the needs of the society and as well promote national development.

Recommendations

For science to be studied effectively as an inquiry-discovery process, the following

recommendations are made:

(1) Science equipment and facilities should be provided in science classrooms/laboratories. For instance, to ascertain the exact and accurate pH values of the solution samples used in this work, more sophisticated equipment such as the pH meter can be applied

(2) Students who have no knowledge of sophisticated equipment such as the pH meters should be stimulated first to think and explore ways of measuring accurately the pH of the solutions of the samples. This is bound to stir up the spirit of inquiry and discovery among the students.

(3) More extracts of plant and animal origins should be included in this work for students using the universal indicators and litmus and subsequently pH meters.

(4) Also, the design and working of the pH meter should be made known to the students to stimulate their curiosities and scientific attitudes of inquiry for discovery.

References

Ababio, O. Y. (2004). *New school chemistry: Senior secondary science series*. Third Ed. Nigeria. Africana First Publishers.

Agbo, F.O.(2000). *The science teachers' companion*. Jos Deka Publishers.

American Association for the Advancement of Science (AAAS,1965). Science: a process approach for testing in elementary schools. Commentary for teachers in USA.

Besmart-Digbori, E.D.(2008). Science and technology Education : Challenges for the21st century. *Multidisciplinary journal of research development* 10 (1), 28-32.

Johnstone, H & Wham, J.B. (1980). Science education notes. *School science reviews* 61 (217).

Matthews, R (1993). Unraveling the mind of God: Mysteries at the frontier of science . London. Virgin Ltd

Oguniyi, M M. (1983). Teaching science in Africa. Nigeria. Salem Publishers. Science Teachers Association of Nigeria (STAN, 1988). Chemistry for senior secondary schools. Ibadan. Heinemann educational books Ltd.

ISSUES IN THE IMPACT OF ISLAM ON HAUSA LAND IN THE 21ST CENTURY

Sabi'u Ibrahim Fago and Yusufu Bala Usman

Abstract

Societies emerge and develop at different periods of time. Many factors are responsible for their emergence and development. Factors such as economic, religious, cultural, geographical, political etc. are in the forefront. In Hausa land, religion particularly, Islam was responsible for some important developments in the land. This paper therefore, intends to give the historical background of the coming and spread of Islam in Hausa land and explore some of the significant impact it has on the lives of the populace and the relationship it fashioned between the Hausa people, Hausa land and other people around especially in the 21st century; the era of globalization, democracy and good governance among others.

Introduction

This paper will attempt to define Hausa land, its belief system and how Islam is introduced and its impact on the lives of the people. Hausa land is an area of West Africa consisted of large states of Kano, Katsina, Zaria, Daura, Kabi (Kebbi), Rano and Garun Gabas and some other smaller states situated in the present day Northern Nigeria and Niger Republic. The land is roughly bounded by a line moving from Azben southwards to the North-eastern boundry of Jos High lands, then westwards to the great bend of the River Kaduna and runs North-west to the valley of Gulbin Kabi and then North-eastwards to Azben (Smith 1987). This was the area in which the majority of the people spoke Hausa as their first and only language and the cultural and social traits often associated with the Hausa people predominated. But since the fifteen century, the combined effect of the southward movements of the Hausa people and the coming of the Tuaregs, Fulani and Bare-Bari immigrants caused the development of two marches of Hausa land, the northern and eastern in which though the Hausa language continued to be the commonest language, it was no longer spoken as the first language by the majority of the inhabitants. (Mahdi 1987).

Prior to the introduction of Islam, Hausa people practiced the tropical African religion which involved belief in a high and distant god not actively connected with the everyday life of men, in addition, a great array of supernatural forces directly in touch with mankind and controlling its destiny. The high god of the Hausawa was Ubangiji, the nearer spirits iskoki and the maintenance of correct relations with the latter was the object of ritual. Communion with the spirits was partly achieved by sacrificial procedures carried out by family heads and also by "possessions", spirits in possession of human beings are termed as bori; The bori is carried out by the Bokaye who were specially skilled in mysteries of the spirits and playing an important political role in the Hausa states (smith, 1987).

With the introduction of Islam, it appeared to have taken the form of gradual modification of the old beliefs and practices in which 'Ubangiji' become progressively of greater and greater significance in the affairs of men while 'Iskoki' become progressively relegated to the essentially subordinate and harmless position of 'Jinn'. Politically, the Bokaye come to share power with the Malamai and the Sarki to occupy the uneasy position of leader of both groups (Smith, 1987).

The Coming of Islam in Hausa Land

It is generally believed that, the date of the first appearance of a Muslim is not known. Hausa land seems to have lacked direct contact with North Africa prior to the 15th century A.D. it is indeed most likely that the earliest Islamic influences in Hausa land were of western rather than northern. Thus in both Kano and Katsina the spread of Islam is traditionally associated with the eastward migration into Hausa land of people called the Wangarawa (Smith, 1987).

However, it had been argued that, long before the coming of the Wangarawa Islam was in existence for centuries in Hausa land. A renowned Islamic scholar Sheikh Nasiru Kabara said that

even at the arrival of Malam Abdur-rahman Zaghaite (leader of the Wangarawa) he met with Malam Amadu (Wali mai Geza) who was then teaching the book of Mukhtassar (Ibrahim 1989). Again, Islam was introduced into Hausa land through Bornu. In Bornu Islam was believed to have been introduced since the time of caliph Umar ibn Abdul-Aziz who sent ten learned men to come and teach Tauhid. Furthermore, by 900 AD an Islamic scholar called Malam Wasami by the Barebari visited Njimi which further facilitated the growth of Islam and preached the gospel up to Hausa land. Thus the introduction of Islam in Hausa land pre-dated the coming of the Wangarawa (Mustapha 1982). In the ancient city of Daura for example Islam might have been introduced earlier than the coming of the Wangarawa because according to the Bayajidda legend the people of the city were prevented fetching water from the only well unless on Fridays. Similarly, Friday in Islam is referred as the most sacred day: being a small Id-day (gathering for the Friday congregational prayers), the day Prophet Adam was created and ejected from the paradise; the day the world was created and the last day (Day of Judgment); the day which Prophet Abraham was saved from the fire.

Apart from the activities of the Islamic scholars from North Africa, the merchants through the Trans-saharan Trade also played great roles in the spread of Islam. Trans-sahara trade which now gave way to modern and more sophisticated forms of communication by air, roads and water enable the spread of Islam as globalization enables the spread of western forms of development. The trade routes and the terminus served as channels of spreading and exchange of good and ideas.

The Spread of Islam in Hausa Land

By the second half of the 15th Century, the spread of Islam in Hausa land recorded an overwhelming success. This was the period when leaders or kings started accepting the faith and championed its spread, this was facilitated by the influx of the Wangarawa immigrants into Hausa land between 1431-32 who were forced to migrate due to the uncompromised stance between Sheikh Al-maghili which he had taken against the connivance of the rulers of Tuwat, the most important trading terminus in southern Algeria linkiung Bilad al-Sudan with the Magrib and the jewish merchant class, who were accused of manipulating the commercial activities in the area to the detriment of the Muslim people there (Kani 1997). By this period a new dynasty came to power in Katsina founded by Muhammadu Korau 1445-1495, the first ruler whom tradition claims as a muslim who employed the services of the Wangarawa migrants as Qadis in courts and Imams in the mosques. His association with the muslim clerics is said to have consolidated his political base and allowed to exercise a considerable control over his domain. The other two leaders that followed him Ibrahim Sura (1495-9) and Ali (1498-1524) continued on the same way of propagating Islam in the state. Sarki Ibrahim in particular ordered construction of mosques in all the villages under his domain. The clearly Islamic character of the new Katsina was again demonstrated by the visit of the celebrated North-African scholar Sheikh Muhammad Al-Maghili in the mid 1490s, by the settlement of the Qadi Aida Ahmad of Tazakht (1529-30) in the city after a long study tour of mecca and cairo and the visit of Makhlif al-Balbali (1533-4) (Ajayi and crowther, 1978).

Similarly, Kano at this time became under the rularship of Muhammadu Rumfa (1463-99) under whom the effective Islamisation of Kano took place. However, according to the Kano Chronicle the Islamic impulses in Kano is attributed to the reign of Sarki Ali Yaji Dan Tsamiya (1349-85). Moreso, the migration of Wangarawa intensified the spread of Islam during the reign of Muhammadu Rumfa. The immigration of Wangarawa under charismatic leadership of Abdur-rahman Zaghaite began from 1431 (Ajayi and crowder 1978). Between 1491 -2 Almaghili was in correspondence with Muhammadu Rumfa and shortly afterwards visited Kano and wrote a small treatise on government for him (the obligation of the princes). At some times between 1504-1518 Abdur-rahman Suqqain and Makhluf al-Balbali (who taught in Katsina) taught in Kano. The teaching activities of these scholars mark the emergence of Kano as a muslim city; its "conversion" is symbolized by the cutting down of the sacred tree, an event which both Kano Chronicle and Wangarawa sources attributed to the reign of Muhammad Rumfa, (Ajayi and Crowder 1978). Similarly, Sarki kisoki did alot in the spread of Islam in Kano. During his time alot of books on Islamic education, literature, Hadith, jurisprudence, Islamic history were brought to Kano.

Another figure that contributed immensely to the spread of Islam in Hausa land was Muhammad Rabo (1503-30) of Zaria. He accepted the religion and spread it in the state. The Islamic

immigrants were also seen in Zaria teaching people Islamic religion. Zaria became a stronghold and centre of Islamic learning.

The Impact of Islam in Hausa Land

Since its introduction into Hausa land, Islam has left permanent legacies on the lives of the Hausa people and Hausa land in general. As it has been stated by professor Mahdi Adamu that the "Hausa ethnic unit has shown itself as an assimilating ethnic entity and the Hausa language a colonizing one…. " (Mahdi, 1978). This has really been the case, the Hausa people have accepted and assimilated Islam and have restructured their way of life along the Islamic lines and at the same time imposing it on other ethnic groups. The Hausas are now identified with Islamic religion and Hausa land as the land of Islam by most Nigerian ethnic groups.

The early impact of Islam on the Hausa land especially in Katsina, Kano and Zazzau had resulted in the gradual transformation of the socio-political and to some extent, the economic condition of the people of Hausa land. As can be argued to be a replica of what is happening in the 21st century i.e globalization which is shaping the ways of life of the population world wide by bringing the distant world closer to the peoples through the communication gadgets; satellite T.V. stations, G.S.M, Internet, Radio e.t.c. The tendency of imbibing or learning new religious beliefs through the Trans-saharan Trade is replicated in the modern democracy and good governance. This democracy formed the bedrock of globalization. Thus the centuries old belief in the 'Iskoki' religious system, the dominant belief system in Hausa land by them began to give way for a more universal belief system i.e Islam, which was later over the next centuries to not only replace the old belief system in Hausa land, but also radically alter the political system and institutions in Hausa land, so as to conform with the Shari'a (Kani, 1997).

The development of Islamic education was witnessed in Hausa land was associated with the immigration of Wangarawa scholars. Hausa cities thus became centres of Islamic learning. The immigrants were scattered in most parts of the Hausa land. An example of activities of Wangarawa scholars can clearly be seen in Kano during the reign of Sarkin Kano Rumfa and Kisoki. By this time great Sheikhs arrived Kano with new Islamic books, few among the Sheikhs were Malam Shehu Batunashe who brought the book of Ashafa, Malam Abdus-salam who brought Mudawama, Jamiussagir, Malam Usman Sidi Ahmed a Sheikh of Qadiriyya brotherhood and Malam makhluf ibn Ali al Balbali. This led to the development in Arabic literature and literacy in Ajami as a source of communication among the Hausa people (Muhammadu 1988).

Furthermore, the early Islamic education prepared the ground for the incorporation of Islamic system of education into the modern (western system, which gave the birth of modern Islamic Universities located in Nigeria and Niger Republics). These are the Katsina Islamic University and Islamic University in Niger, Niamey.

The coming of Islam into Hausa land and its development from the 15th century connected the Hausa land with the North African states, Middle East and the Europe. Direct contacts through the Trans-saharan trade routes which connected Kano, Katsina with Tuat (in todays Algeria), Ghadames and Ghat (in todays Libya) across Tripolitania (in Libya) and Egypt to Hijza was established over the years for the purpose of economic, Cultural, diplomatic and intellectual relations between the rulers and the people of Bilad-al-Sudan and their counter parts in other centres of Islamic civilization in Northern Africa and beyond. As a consequence of this relations, books on various types of disciplines, merchandise, technological and scientific cultures started to flow, mainly form Northern direction towards the south (Kani, 1997).

Economically, the introduction of Islam facilitated the movement of the Hausa people in long distant trades to all parts of Western Sudan, Northern Africa and beyond. This was brought about by the teaching of Islamic brotherhood among the traders other than Hausas. The zeal with which the Muslims had on commercial activities and the dangers against indecent commercial activities, a provision clearly outlined by the Qur'an on good and legal or legitimate transaction paved the way for the establishment of Islamic banks and stock exchange such as Jaiz, Habib Bank and an Islamic Bank in Niger Republic.

Politically, the introduction of Islam inspired the kings in Hausa land to embark on the conquest of pagan states. This is because arms were imported from North Africa. An example of this is the expansionist activities of Muhammadu Rumfa in Kano. It also brought about the

awakening of a mixture of western democracy and Islamic form of governance in the implementation of the Shari'a system of administration by some state governments from 1999 with Zamfara, Katsina, Kano and many Northern states a step earlier taken in the early 19th century by Sheikh Usman Danfodio. There are also the establishment of the Hizba (commanding for good deeds and stopping bad deeds) and sheri'a commissions in many Northern States.

The introduction of Islam in Hausa land in particular and West Africa in general has created divisions among historians and social scientists making judgment from some of its impact especially the socio-cultural aspects. This has to do with some recent happenings world wide that involved Muslims. For instance with the reintroduction of Shari'a legal and administrative system in some states of Northern Nigeria from 1999-2007, criticisms, suspicions and protests erupted among the non-Muslims. There were religious crises in Kaduna, Bauchi, and Kano to mention a few. There was also the Jos mayhem, in which a number of people were murdered, an event which took place in 2001, 2004, 2008 and 2010. Again, the recent attempt by Umar Mutallab a Nigerian in the U.S.A to explode a plane was viewed as terrorism which was labeled against Islam and Muslims. However, judgment could only be made if one reads and understands the teachings of Islam which shun against tribalism, terrorism, violence, murder and all sort of atrocities on human beings. This tendency of looking at religion as a source of violence or conflict is what Bala Usman termed as manipulating of religion to attack the basis of the corporate existence of the Federal Republic of Nigeria (Usman, 2000). Those who championed this selfish interest goes with the image that is fabricated, that Islam and Christianity have always been antagonistic in Nigeria, to achieve their short-sighted political ends.

Conclusion

The introduction of Islam in Hausa land has greatly impacted on the lives, languages, culture, religion and many other sectors of Hausa land. It has changed the life of the people from superficial beliefs to a more universal belief system. Islam came along with literacy and literature; this made it possible for the Hausa people to become literate for a long time. This Islamic knowledge helped the people in writing their history and the history of other places. A good example of this is in the writings of the Kano chronicle which were written in Arabic. The introduction of Islam into Hausa land also connected the Hausa people with the outside world of the North Africa, Middle East and Europe.

Recommendations

This research having discussed on the issues of the introduction and the impact of Islam in Hausa land in the 21st century, serves as starting point of researches on current issues in Hausa land. It is therefore among other things recommended to:

- ✓ Guide researchers on the geographical position of Hausa land.
- ✓ Assist students and researchers alike in studying the introduction of Islam in Hausa land.
- ✓ To compare the early impact of Islam in Hausa land and relate with contemporary issues.
- ✓ Help researchers on the issue of relationship between Hausa land and other nations.

References

Adamu, M (1978): *The Hausa factor in West African history*, Zaria: Ahmadu Bello University Press.

Ajayi, J,F & Crowder, M (eds) (1976): *History of West Africa* Vol. I, London: Longman.

Ibrahim, M.S (1989). Tarihin Ajamin Hausa kafin Jihadi. A seminar paper presented to the Center for the study of Nigerian Languages, Bayero University, Kano.

Kani, M.A: (1997). The place of Katsina in the intellectual history of Bilad-al-sudanup to 1800 in Tsiga, I.A & Adamu, A.U Islam and the *History of Learning in Katsina,* Ibadan: spectrum Books Limited.

Mustapha, A.A: (1982). A new interpretation of the History of Islam in Kanem Borno. A paper

Presented at departmental seminar Department of Islamic Studies, B.U.K 15th March, 1982.

Smith, A. (1987): *A little new light-selected Historical Writings*, Zaria: Gaskiya corporation Limited.

Usman, Y.B & Alkasim Abba (2000): The misrepresentation of Nigeria, Zaria: centre for Democracy development research and training.

A REVIEW OF MODERN APPROACH TO COMPUTER AUDITING

B. N. Ifezue

Abstract

The auditor, today, will find computer technology not only relevant but almost indispensable if he is to catch up with modern trend in the profession. The ability. Of the auditor to give a true and fair opinion on the financial statement is the hallmark of the profession.

In order to discharge his duties with integrity, various sorts of financial data will have to be gathered, assessed and evaluated. It should be possible for the data to be easily or readily located, and the evaluation or judgment to be made within the ethics and contention of the profession.

Areas to cover in the paper include the following:

- Concept of Computer Auditing
- Controls in EDP environment
- Approach to Computer Audit
- Computer Assisted Audit
- Techniques (CAAT).
  - Generalized Computer Software
  - Computer Code Analyses/Program
  - Auditing
  - Snapshots Integrated Audit Monitors
  - Tagging
  - The 'Cusum' Technique
  - Parallel Simulation and Normative Auditing
  - Trace Routines and Mapping.

Introduction

Concept of Computer

Computer auditing can be described as simply auditing in a computer environment with reference to the programmed controls carried out by Computer applications and the manual controls exercised by the users.

To achieve Computer Auditing, there must be two levels of controls:

- **Program Controls**

These are the controls built into the application programs such as payroll programmes of edit, update, etc which monitors the processing activities of the system and ensure that the data integrity is maintained.

- **Manual Administrative Controls**

These are controls instituted during the development state, which define the method of activities within the computer environment to ensure that information is only available to the authorized users only.

Computer auditing also involves the monitoring of these controls and the periodic expression of opinions on how the activities function.

Computer usage by auditors can be looked into from different perspectives e.g. that an auditor uses the computer as an aid to his work such as the provision of test data or that the auditor actually looks into the working of a Financial Computer environment and makes up his opinion as to the correctness, effectiveness and efficiency of the result of operations.

Auditors therefore need to either specialize in systems support techniques or need at least an ability to work to systems support specialist in their own technical language.

Auditors often perform financial audits. But they may also be called to do special investigations, fraud detectives, efficiency audits and exercises to ensure that set standards and normal

procedures are complied with.

A good volume of computer auditing is the function of Internal Auditors. Reliance on the work of internal auditors will make external auditors to give a positive opinion to the computer operation. However, external auditors must take a compliance test of controls in EDP environments.

Controls in EDP Environment

Controls in EDP environments are mainly internal controls situated by management to provide proper processing of functions of the data processing department. The controls in EDP environments are of two broad forms, namely:

- General or Organizational Controls
- Application or Procedural Controls

The general or organizational controls involve the following administrative controls:

- Segregation of duties.
- Control over operation.
- File controls.
- Fire precaution, backup procedures and stand by provision.

They also involve systems development controls such as:

- Establishment & review of Systems development standards.
- Authorization and approval of works to be done.
- File conversion controls.
- System * Programme testing documentation.

The application or Procedural Controls are controls under the influence of programmes developed for various applications and they involves controls in the following areas of operations:

- Input
- Input conversion
- Processing
- Output
- File Maintenance

For each of these controls, the overall objective is to ensure that the information obtained from a computer processing is complete, sufficient and reliable.

The duty of the Auditor, internal or external, is to ensure that these controls exist and that they are being used in the day-to-day operation of the organization.

The Auditor looks into the work of Computer audit from two perspectives depending on what he thinks the tool "the computer" is all about.

Approach to Computer Audit

Part of the application or Procedural Controls in EDP environment is the processing control. This is the control due to the processing functions of the computer. The auditor's consideration of the processing activities within the computer systems is of two forms, namely:

In "Round the computer approach", the Auditor considers the computer as a black box and does not concern himself with the internal working of the computer. Evidence regarding the completeness, accuracy and validity of processing is obtained by a reconciliation of Computer output with input and ensuring that controls of input and output are working accordingly.

"Round the computer Audit Approach" is more applicable where the volume of data is small and well organized, output from the computer more detailed and can be correlated with input and there is no serious complexity in the calculation and manipulation of information.

In "Through the Computer Audit Approach" the computer is not regarded as a black box and the auditor does not only reconcile input to output but he carries services of programmes processing procedures which take place within the Computer as a basis for reaching conclusion regarding the validity, completeness and accuracy of processing.

This approach requires that the auditor should be conversant with the working of the

computer and how the computer can help us facilitate this work. Because of the modern trend in computer technology e.g. Terminal microcomputers, etc, it is the recommended approach.

As the complexity of information processing increases and the volume of data also increases, the need for the auditor to develop techniques to assist him in his audit becomes relevant. He does not have to limit his option to the approach to use but looks for aids to use no matter the approach, especially now that information technology has developed into new trends.

Computer Assisted Audit Techniques (CAAT)

Computer Assisted Audit Techniques (CAAT) are techniques used by the auditors to meet the challenging changes in computer development. They refer to all those audit procedures, which make use of computer programmes, computer data and other computer facilities. New trends in computer auditing mainly involved improvements and usage of the CAATS.

CAATS can be subdivided into those techniques, which are used to review real (productive) data and those which are used to controls. The division is perfect as the former can also, by implication, tell the auditor a lot about the latter and vice versa.

CAATS are used

- To overcome problems that may be caused by changes or losses in audit trail.
- To ensure that the audit is carried out in a more efficient and effective manner.

CAATS includes the following

(i) Generalized Computer Software.
(ii) Computer Code Analyses/Programme Auditing
(iii) Snapshots
(iv) Integrated Audit Monitor

All these techniques assist the auditor to make up his opinion on the validity, Accuracy and correctness of the systems environment.

Generalized Computer Software

These are software packages e.g. Utility programmes which may be found useful by the auditor, even though it was not written with the auditor in mind. Auditors do find them useful in the examinations of real data as well as facilitating file handling and interrogation of files. Examples are:

(i) File interrogation package, which the auditor can use to access files as if an audit enquiry package is in use.
(ii) The Data Base Management System (DBMS) which can be used to 'front-end' with the auditor's computer audit enquiry package, in order to supply data and format it in a way that can be handled by the audit enquiry package.

Generalized computer software can also be used to assist the auditor in his review of the system particularly, systems controls.

Computer Code Analyses/Programme Auditing

This technique involves review of the programme logic in order to determine their correctness. It demands an understanding of programming and principles of programming by the Auditor.

As the programme listing of the programme is about the closest an auditor can get to in a computerized system, the techniques attracts systems auditors who are desirous to review the actual system. However, the auditor who is looking at what the system actually does so it is essential that the auditor take all reasonable steps to satisfy himself that he is reviewing the operational version of the programmes. The auditor must assure that the source programme under review is actually the programme used for processing.

Snapshots

This is a part of the technique used to review the systems performances. It entails the photographing of the computer memory using specialized devices, during the execution of programmes. A series of such photographs will enable the auditor to recreate the sequence of

programme procedure in order to carry out an analysis regarding the correctness. It is a technique that requires an advanced technical facility and knowledge to interpret the result of the analysis.

Integrated Audit Monitor

This is a module of Computer programmes which is built into the operational system either temporarily or permanently and is used either occasionally or continuously for audit purposes. It is either a separate programme built into a computer application or a part of an application programme.

The technique allows the auditor to do some of his work at the time that the data is being processed or very shortly afterwards. It is suitable where audit trail is deficient such that historical audit work is difficult. It can be designed to print out reports of audit interest for subsequent review.

It is a useful technique in a distributed system with online as well as real time systems as it can be used for continuous monitoring of transactions passing through the system. The technique is commonly used to achieve three audit requirements.

- To gather and store information relating to transactions which are available at the time of processing, for subsequent audit review to determine correctness.
- To check at integrity of files which are being processed.
- To spot and record for subsequent audit attention any items which are usual or of special audit interest.

Tagging

The procedure of tagging in auditing is more suitable for online, real-time systems using a database. It involves the incorporation of a single character field to the system at the design stage. This field may be activated by an auditor's tag. The activation may occur due to the request of the auditor who must have selected that entry for further investigation or at the working of the internal control systems which must have noticed the entry as an aberration from the norm.

When an active flag or tag is selected, the system will list them out for the attention of the operators of the system. The audit team will subsequently investigate the cause of the flagging.

It is an expensive system, as it needs the use of extra design concept for the software in use.

Tagging procedure will be better if it is incorporated into the operating system, as very few professionals are capable of tampering with operating systems. This will give the auditor's technique a measure of protection from unauthorized scrutiny or amendment.

The 'Cusum' Technique

The word "Cusum" is derived from cumulative sum. The technique involves the auditor's usage of his own incorporated routines to accumulate cumulative sums or moving averages relating to the occurrence of particular conditions during processing, such as significant variances from regular practice. Examples of usage of his own incorporated routines to accumulate cumulative sums or moving averages relating to the occurrence of particular conditions during processing, such as significant variances from regular practice. Examples of usage of Cusum Technique are in the areas of:

- The incidence of specified processing conditions.
- The nature of output e.g. average number of lines per document.
- The inconsistency of related data items.

Parallel Simulation and Normative Auditing

This method involves the development of models of applications to be audited under the control of the auditors, the model is computerized and contains the features of the application systems from the auditor's viewpoint.

The live data is used to run the auditor's model as well as the real version of the system. The auditor compares the result of the model and the operational version and prepares his report, which may expose differences which may have to be further tested. Usually, the auditor's model reflects the norm of standard of operation upon which the operational system is tested, hence the reference to the method as normative.

The method test both the current operation of specific programmes and programmes controls

and verifies specific values included in computer records.

Trace Routines and Mapping

Tracing technique is the approach used in programming at the initial programme development stage to debug programmes where the reason for error is apparent whereas mapping tends to detect coding instructions, which were not active at the processing state.

Auditors use Tracing Routine to establish the sequence in which programmes instructions are executed within the CPU. They are also used to debug programmes in order to locate progamme errors.

Auditors use the mapping technique to detect programme codes, which are not executed during processing thereby determining the reasons for their not being executed; either they are logically bypassed or they are planted for subsequent activation.

Awareness of such redundant codes will enable the auditor carry out an assessment regarding their effects on the completeness, accuracy and validity of processing.

Conclusion

Auditing in a computer environment, especially at the current level of information technology, requires a full knowledge of Computer studies and auditing procedures, Auditors should not "Audit Round" the computer again. A 'Through' the Computer Technique therefore requires the knowledge of the workings of the computer, especially, the modern trend of Online, Real time and Databases which require advance knowledge of the techniques of suitable auditing approach.

The paper has attempted to provide the list of procedures, which are available for auditing Through the Computer. More developments are still being conceptualized to improve Auditing of Computer environment.

References

A.R Millichamp, (1996). *Auditing – An instructional manual for accounting students*. New York: McGraw-Hill Inc.

Andrew D. Chambers & John M. Court, (2002). *Computer Auditing.* New York: MacGraw-Hill Inc.

The Nigerian Accountant- April/June 1987 Vol. XX Number 2.

V.R.V. Cooper (2001). *Students Manual of Auditing,* Gee and Co. Publishers Limited 151, Strand, London Wc2R13J.

Imudia, S.A. (2003),.National development of data networking and information technology. *The Nigerian Banker* January – March, Lagos CBN Press.

RELEVANCE OF QUALITY BIOLOGY TEACHER EDUCATION TO NIGERIA ECONOMIC GROWTH AND DEVELOPMENT

Sylvester A. Anyifite

Abstract

The reliance of quality teacher education has brought about so much campaign in the teaching learning profession and this has brought about proper monitoring to meet up standards for the nations economic growth. the content and purpose of this paper seeks to address the relevance of the seven pointy agenda with particular emphasis on the education sector vis-a vis development of human capital and research to provide materials and products needed to meet the agenda's requirements. In furtherance of this research, the quality and quantity of biology teachers and its relevance to vision 20:2020 was further identified to include production of highly motivated and efficient classroom teachers for the education system and to encourage further the spirit of enquiring and creativity in teachers and so on and some points drawn out in terms of how the biology teachers can help in the nation economic development vis-a-vis adapting an inter disciplinary approach in other to cope with new issues in biology and the need to provide practical experiences in biological investigations and some recommendations made vis-à-vis ability to solve everyday problems relating to adequate funding of education for the provision and upgrading necessary institutions of learning and urging government to invest heavily in education for Nigeria economic growth and development.

Introduction

Educating people in science and technology has been widely acknowledged as a sure way of promoting economic development, eliminating poverty and introducing social welfare. Investment in science and technology education has many years been a priority to most countries of the world. (Nwagbo, 2005) Developing countries such as Nigeria, Ghana etc have made concerted efforts to generalize the provision of science education to both secondary and primary schools. For science teachers to confidently and effectively discharge their duties, they must be guided by certain standards or rules for operation, which will give them a pride of place in their chosen careers (Nwagbo, 2005). The present teaching and learning in science classroom in Nigeria seem inadequate. The level of science teacher competence needs to be raised to the level that will allow teachers to teach students using varied instructional aids with a focus on understanding rather than lecture, transmitting textbook knowledge with the consequent student rote-learning and simple recall knowledge (Ameh, 1991).

All teacher education programmes aim at developing good teaching skills, teacher education should equip teachers to communicate effectively. Teachers should be taught by the same methods which they will be expected to use in teaching children, that is, they should acquire some skills with a degree of independence. What makes a good teacher really depends upon objectives of the teaching, the context, the age of the students and what the teacher perceives to be needed by the students. All the above factors could combine to make a good teacher but what supersedes all is the degree of combination linked to a respect for the students as an individual (Ameh, 1991). In line with, the President Musa Yar'adua declared that he met a nation with vital infrastructure such as roads, power, water supply, etc in comatose state while key sectors such as agriculture, manufacturing, education and transportation were floundering. It was against this background that in August 1, 2007, the President unveiled a Seven-point agenda which he hopes would set the socio-economic state on track. The agenda is to serve as the platform from which his administration on would spring off to transform Nigeria into one of the twenty largest economies of the world by the year 2020. He enumerated the seven point agenda as

1. Power and Energy
2. Food, Security and Agriculture
3. Wealth Creation and Employment

4. Mass Transportation
5. Land Reforms
6. Security
7. Qualitative and Functional Education

Details of the agenda exactly as published by government are presented below to serve as a reference in the challenges they pose to education.

1. Power and Energy: The infrastructural reforms in this critical sector through the development of sufficient and adequate power supply will be to ensure Nigeria's ability to develop as a modern economy and an industrial nation by the year 2015.
2. Food Security: This reform is primarily agrarian based. The emphasis on the development of modern technology, research, financial infection into research production and development of agricultural inputs will revolutionalize the agricultural sector leading to 5-10 fold increase in yield and production. This will result in massive domestic and commercial outputs and technological knowledge transfer to farmers.
3. Wealth Creation: By complex reliance on revenue from non-renewable oil resource, Nigeria has yet to develop industrially. This reform is focused on wealth creation through diversified production especially in the agricultural and mineral and solid mineral sector. This requires Nigerians to choose to work, as hard work by all is required to achieve this reform.
4. Transport Sector: The transportation sector in Nigeria with its poor roads network is an inefficient means of mass transit of people and goods. With a goal of a modernized industrialized Nigeria, it is mandatory that Nigeria develops its transport sector. The government has already started this process by the ongoing rehabilitation and modernization of the railway. While the reforms might take some time to effect, it is a need that must be addressed.
5. Land Reforms: While hundreds of billions of dollars have been lost through unused government owned land asset, changes in the land laws and the emergence of land reforms will optimize Nigeria's growth through the release of lands for commercialized farming and other large scale business by the private sector. The final result will ensure improvements and boosts to the production and wealth creation initiatives.
6. Security: An unfriendly security climate precludes both external and internal investment into nation. Thus, security will be seen as not only a constitutional requirement, but also as a necessary infrastructure for development of a modern Nigeria economy. With its particular needs, the Niger Delta Security issue will be the primary focus, marshaled not with physical policing or military security, but through honest and accurate dialogue between the people and the Federal Government.
7. Education: The two fold reforms in the educational sector will ensure firstly the minimum acceptable international standards of education for all. With that achieved, a strategic educational development plan will ensure excellence in both the tutoring and learning of skills in science and technology by students who will be seen as the future innovators and industrialists of Nigeria. This reform will be achieved through massive infection of money into the Education sector. This 7-point agenda represents the vision of the present administration which is to strengthen the reforms already started and re-build the Nigerian economy to become one of the twenty largest economies by the year 2020. (Okeke 2008)

Implications of the Seven Point Agenda for the Education Sector

According to Okeke, 2008 the analysis of the intent and content of each of the seven point agenda reveal lots of implications for education;

(i) Development of human capital**:** Does Nigeria have enough human resources to drive the seven point agenda? Whether it be power and energy, food security, wealth creation, health or indeed personnel to implement the agenda. The required personnel include scientists, technologists, technicians, engineers, metallurgists, economists, medical practitioners, agriculturists, accountants, legal personnel who possess the expertise to actualize the agenda. It is in none other than the education sector that such personnel can be produced. It is logical therefore to assert that any agenda that does not put education sector first and adequately fund

it to produce required human resources cannot guarantee the success of any development agenda.

(ii) Research to provide materials and products needed to meet the agenda requirements: Achievement of the goals of the seven point agenda depends heavily on what and how science and technology in solving the problems of food security, poverty, power, energy, security, environmental degradation and underdevelopment can never be over emphasized. Many questions are begging for answers in those areas covered in the 7-point agenda – Energy, Power, Agriculture, Food security, Wealth creation, Transportation and Education sectors can only be provided through research. Research Institutes will require massive injection of personnel and funds to facilitate research into the various sectors of the economy. The Institutes are part and parcel of the education sector. They work in collaboration with other arms in the education sector such as Universities and Polytechnics. Collaborative researches seeking better ways to actualize the goals of the agenda must be encouraged and financially sustained. Here the PTDF and the private sector have major roles to play in financing researches for national development.

(iii) Enlightenment of the Public/Stakeholders**:** Education 'is the instrument for any sustainable development. In addition to producing experts, education at its most fundamental level serves as the key to the production of literate citizenry who are able to understand their role in the socio-economic and political development of the nation. The UN Chronicle of June/August 2003:3, rightly asserted that "education is the instrument for any sustainable development; it also has the power to transform the individual and the world for better". It is the education sector that has the capacity to package and organize suitable mass education programmes on government's agenda that are capable of penetrating different social strata, reaching the grassroot populace. Such advocacy and mobilization procedures include public seminars/conferences, meetings, rallies, school children's menu. There are many Nigerians who have not even heard or who do not know what the seven point agenda is all about; they just hear the slogans on the radio and television. The success of that agenda depends heavily on education of the public so that by becoming aware of their responsibilities and expectations from the agenda, they can easily key into the vision. The sum total is that quality biology teacher education is at the center of successful implementation of the 7-point agenda. The driver of any education is the teacher hence science teacher education programme is critical to nation economic development and growth.

Vision 20:2020 and the Seven Point Agenda

It is expedient to appreciate from the on-set that vision 20:2020 is the dream or development aspiration, and the 7-point Agenda is the road map or the planning imperatives. (Tahir, 2008). For 2009, the President proposed that "new projects must be well articulated, properly costed and sensibly prioritized taking into account available resources and the implementation capacity of the ministries, departments and agencies". Thus 91% of the capital vote would be spent on Agenda, namely: education, food security, national security, power/energy, land reform, job creation and the Niger Delta. As for the recurrent vote, a number of cost-saving measures would be introduced in view of the declining oil prices occasioned by global recession. We should expect to see a well-controlled but fairly robust infusion of investment funds into our sector to deal with issues of improved infrastructure. We should also expect a greatly reduced expenditure in general administration and services. If and when this happens, a welcome reversal would have taken place in expenditure pattern in favour of development, for the first in a very long time. Furthermore the vision does not see government as the only agent in delivering on these promises. Rather government intends to engage the private sector to serve as co-implementor of the Agenda. (Tahir .G. 2008). It is fair to assume that Vision 20:2020 is relying on the education sector to be a key driver in realizing its targets, especially those that have to do with human capital development just as the sector is also relying on the vision's new moments to reposition, re-strategize and renew itself so as to face the challenges that might be imposed by the new dispensation. The realization of the Vision's targets cannot be possible without a sound science education. However, achieving sound science education cannot be possible without

the teacher. Teachers are a critical factor in quantitative education delivery. For Vision 20:2020 to achieve its goals, science teacher preparation must be pursued assiduously. To be one of 20 largest economies in the world Nigeria requires a critical mass of people who are literate and skilled to play a significant role in its transformation. Herein lies the imperative of teacher education in the transformation process.

As was alluded to earlier, the Vision and its Agenda promise to inject new funds into the education sector with a view to improving the quality of its infrastructure and enhance it services. Thus we are more likely to witness large scale capital works in form of refurbishing renovation and re-equipped of academic and academic support facilities with cutting edge technologies and teacher renewal. Above all the private sector is likely to become an active player in a variety of educational provisions and or services. The implications of these expectations for science teacher education are many. However, the following challenges are taken into consideration:

i) Production of correct mix of quality teachers for basic and post-basic education within the period of eleven years.
ii) Embarking on an aggressive continuing teacher professional development to up-grade their knowledge, fine-tune their competencies; strengthen their commitment with view to enhancing their performance in the classroom, school and the community.
iii) Modernize quality assurance mechanisms by making them robust and all-inclusive in view of multiplicity of institutional types and their providers. (Tahir, 2007)

Quality and Quantity of Biology Teachers for Vision 20:2020

Like all other large scale national transformation, the successful execution of the education-specific 7-point Agenda item, lies chiefly on the extent to which the teacher factor is taken into consideration. Teachers are generally referred to as mediators of educational innovations. It is for this reason that the teacher is being globally recognized as the most prominent and significant factor that impact on the learning process, especially in the school context. It is equally recognized that competent and dynamic teaching personnel would ultimately produce efficient and effective human resources for national consumption. What all this goes to show is that whatever resources that are deployed to improve education may not bring the desired result unless the teacher factor is adequately addressed. (Ukeje, 1996). Our concern here is the capacity of the system to produce the required quantity of quality teachers for vision 20:2020; through the pre-service framework. Presently there are well over 140 colleges, university faculties and institutes of education in Nigeria, with roughly 600,000 students offering regular courses leading to the award of Nigeria Certificate in Education, baccalauret, and master and doctorate degrees in education. The overall annual output of these institutions is roughly 50,000 – 60,000 students.

The major criticism of this teacher education model is that the production system is out-moded. The content is said to be abstract and its technology archaic. Consequently the output cannot meet the demand of the society, whether qualitatively or quantitatively. The fact that the best brains in the secondary schools usually opt to study courses other than education at the tertiary level is something of great concern to the education industry. So long as Colleges of education and university faculties of education continue to exist in the school system. This capacity gap is a clear indication that the ability of the production system to satisfy the demands of vision 20:2020 will be impaired. Are there solutions in sight? Of course there are the usual palliatives such as introduction of series of incentives to attract and retain good teachers, improving teacher condition of service in addition to making the curriculum more attractive and pleasurable to walk-through etc. We have been saying these year-in and year-out without any significant shift in positive direction. What else do we need to do in order to attract youngsters to enroll in education courses at the tertiary level? The role of education as a tool for economic, social and political transformation as envisioned by our leaders through vision 20:2020 and its 7 point agenda underscores the need for Biology teachers, as it key operators to be part of the changing trend in development. Consequently teachers must be subjected to constant training and re-training if they are to effectively and appropriately perform their roles as agent in the new Nigeria of our dream.

Relevance of Biology to Vision 20:2020

Biology is a basic human science that has always evoked the interest of learners at any level. Its study involves the understanding of the composition, functioning and survival of living things including human beings and other non-living things and their interaction in nature. Though its scope is wide, its relevance to human existence, health and survival, makes it study interesting and valued. The child studying biology starts with life which is familiar and relevant aspects of nature. This enhances his understanding of nature and intellectual development, his problem solving skills development, acquisition of survival values and skills relevant to human existences. The teacher studying Biology is placed in a good position to cultivate similar traits in his learner. The study of biology curriculum exposes the teacher trainee to the understanding of the aims, objectives, scope and application of contents (the various biology topics and concepts) methodologies, laboratory/practical and field techniques of studying, teaching and applying biology as a subject or course of study to life. Like all other science courses, the study of biology exposes the subject relevance, relationships and application to the learners, the society and for economic development (Ango, 1991).

Teacher education is falling between the many tools of the 6-3-3-4 policy of education. As can be seen 6-3-3-4 is referring to primary, junior secondary and senior secondary and university education. I do not believe this is done to spite teachers, but only because the assumption implicit in the entire policy is that teachers are there and will always be available. In section 9 paragraph 57 of the national policy, (NPE 2006) the following statement was made: "Teacher education will continue to be given a major emphasis on all our educational planning, because no educational system can rise above the quality of its teachers". In furtherance of the positive statement, the document listed five purposes which constitute the basis of our quality biology teacher education. These are:

a. to produce highly motivated, conscientious and efficient classroom teachers for all levels of our education system.
b. To encourage further the spirit of enquiry and creativity in teachers;
c. To help teachers to fit into the social life of the community and society at large and to enhance their commitment to national objectives.
d. To provide teachers with the intellectual and professional background adequate for their assignment and to make them adaptable to any changing situation not only in the life of the country but in the wider world;
e. To enhance teachers commitment to the teaching profession.

In all these laudable statements, the teacher emerges as the most important catalyst in the realization of the goals of education for vision 20:2020 (Baikie, 2002).

Good (1959) in relating professionalisation to quality of teaching states that the teacher is concerned with the promotion of the vocation of teaching so that it may increasingly become functional and that this will involve:

(i) Distinctive expertness and high competence resulting from theoretical study and knowledge,
(ii) Practical mastery of pedagogical techniques.

This implies that for quality biology teacher education to meet the need of the country, the following must be put in place:

(i) Specialized competence, skills, attitudes and recognition that characterize the profession in general.
(ii) The extent of preparation, experience and success in teaching.
(iii) The rank or recognition a biology teacher has achieved in the profession.

This being the case, the aim of a biology teacher should be to continually improve the quality of biology teaching and learning for the students and the country's standard of education for vision 20:2020 (Nwagbo, 2005).

The National Science Teachers Association (NSTA) in their position statement on science teacher professionalism and quality recognized the teacher as the key to making science teaching a profession. Consequent on this NSTA set up standards of what quality science teaching and professional practices are, they include:

(1) Knowledge of and participation in the activities of professional community.
(2) Ethical behaviour consistent with the best interest of students and the community.

(3) Willingness to work with students and new colleagues as they enter the profession.

In the context of quality biology teacher eduation, quality can only be achieved if the biology teacher identify quality practices to guide them and ensures that every biology teacher goes for remedial training.

(I) The biology teacher has to go beyond the mediocritical knowledge and move on to biology education that is transformative and that deals with the issue of society.

(II). His/her teaching must meet the needs of the society and he/she must be committed to exemplary practices.

(III). He/she must stay abreast of latest research in practice, reexamine his/her teaching regularly, experiment with new approaches and share his/her experiences with other colleagues.

(IV). The biology teacher should develop a caring attitude for his/her students. Greater care should be taken to understand student differences and developmental stages, so as to address a diversity of learning styles.

(V). The quality biology teacher should have a commitment, to practice beyond the level of one's own needs. This calls for trust and collegiality and teachers and colleagues.

(VI). Effort should be made towards collaborative work so as to encourage interpersonal professional activities; research seminars, conferences etc should challenge the biology teacher to self-development. (Ango, 1991)

Expected roles of biology teachers in promoting quality science education is that the prospective and practicing teacher have major roles to play in the development of knowledge, skills, competences and reform document (National Policy on education, subject curriculum etc). The objectives of science teaching specified in the curriculum are hardly achieved because:

I. of lack of opportunity of the child to have direct experiences with learning materials.
II. Inappropriate learning environment for science teaching.
III. Use of inappropriate teaching methods, others include:
IV. Large class size, rigid school timetable, overloaded curriculum and lack of incentive for the teacher.

However, due to knowledge explosion and the need for the country to move with other countries of this world, the issue of quality biology teacher education has become important and necessary for improving the country's economy and growth toward vision 20:2020.

1. To prepare the majority of science teachers towards this new trend requires awareness and proper coordination of existing knowledge to fit into the new scheme of things.
2. Biology as the science subject most favoured by students need teachers who are well grounded not only in knowledge of subject matter, but also in the skills/competencies needs to impart such knowledge to bring about meaningful learning in the students.
3. For biology teacher to aspire for quality teaching he/she has to be conversant with innovative teaching strategies, which are integrative, child centered and activity based.
4. Furthermore growth in science (biology) requires the teacher to regularly update his/her knowledge through in-service training, attendance at conferences seminars etc but research result indicate low participation in such activities (Abu,2000).

Relevance of Quality Biology Teacher Education and the Nation's Economic Growth and Development to Vision 20:2020

Quality biology teacher education is necessary to cope with the large number of students offering the course at senior secondary school SSCE level and NCE level. The government on their own part has tried to meet the demand of biology education by training more teachers at NCE, degree and higher degree levels. Therefore to serve as a pointer to country's economic growth the quality biology teachers need to:

a. Adopt an interdisciplinary or multidisciplinary approach in order to cope with new issues in biology.
b. Adopt to the widened scope of biology which provide solution to most human activities and problems e.g. food, nutrition drug, pollution, population, disease, radiation, health, hygiene, family life, natural resources conservation and management as well as biotechnology climate change, and ethics (UNESCO 1986).

c. Adopt guided inquiry/discovery method of teaching in the biology curriculum (FME 1984).
d. To provide the students with practical experiences in biological investigation and problem solving.
e. Accept his responsibility to help students cope with the "information overload" of the internet learning and assist in organizing them appropriately.
f. Be armed with sound biological knowledge he should be able to solve everyday problems relating to food, sanitation, erosion, primary health care etc. in this way, the biology teacher functions as classroom teacher, communicator in both the school and the country ensuring life long education that is necessary for economic development of the country for vision 20:2020.

Conclusion

This paper have attempted to examine the contents of the 7 point agenda by defining each of the agenda and also highlighted the implications of the agenda with particular reference to development of human capital, generation and sustenance of research and enlightenment of public/stakeholders of need for development towards vision 20:2020 in the educational sector. In furtherance of research, the paper examines the link of the 7 point agenda with vision 20:2020 as it addresses the major problems in the education sector and why quality and quantity of biology teacher education should be properly addressed. Quality is seen in the context of the skills established by a biology teacher as a result of knowledge and participation in the activities of biology teacher education and willingness to work with students and new colleagues as they enter the professions and ability to identify quality practices such as attending remedial training, be abreast of latest –researches in practice and examine his/her teaching regularity. The expected roles of quality biology teacher education for country economic growth and development towards vision 20:2020 were discussed and enumerated.

Recommendations

This paper proposes that some key measures be pursued to reposition biology teachers and educational institutions to meets the challenges for vision 20:2020 and economic growth and development, the teaching profession must be made attractive to attract best brains, the environment of learning in institutions need to be upgraded, the various teacher training curricula must be reviewed in order to accommodate new national concerns and global challenges and finally government must be prepared to invest heavily in education and further more this recommendation:

i. Biology teacher should regularly update his/her knowledge through in-service training and updates through electronic learning.
ii. He should be able to cope with the information overload and should assist in organizing them.
iii. His ability to solve everyday problem relating to sanitation, food, erosion climate change, that may enhance the growth of the economy towards vision 20:2020.
iv. Adequate funding for the provision and upgrading of necessary teaching aids, laboratory materials and tools.
v. Teaching methods improvement, steps should be taken for continuous teaching methods review/improvement to make the teaching methods current and relevant to contemporary needs of the economy.
vi. Compliance with carrying capacity standards, institutions involved in teacher education should limit admission of students to what their facilities can support.
vii. It is desirable to have special scholarships and awards for quality teacher education in order to provide additional incentives for people who want to go into the teaching profession.

References

ABU, A.O (2000). The effectiveness of individualized and lecture motivational methods of teaching biology at the senior secondary level. *Zaria Journal of Educational studies* (4), 1 and 2, PP 151 – 153.

Adamu Baikie (2002). *Recurrent issues in Nigeria education*. Zaria: Tamaza Publishing Company Ltd. Pp. 228 -229.

Ameh, C.O (1991). *The use of educational technology in teaching. The effective teacher*. Jos: Matchers Publishing Ltd. Pp 33-35.

Ango, M.L (1991). *The effective biology teacher. The effective teacher* Jos Matchers Publishing Ltd. Pp 44-47.

Ajeyalemi .D. (2008) The issue of quality and quantity in Nigeria's teacher education system.

Federal Republic of Nigeria (2006). *National policy on education*. Lagos. NERDC Press.

Federal Ministry of Education (1984) *National curriculum for senior secondary school biology*. Lagos: Government Press.

Federal Republic of Nigeria (2007). The seven point agenda. Released by the Presidency.

Good, C.V. (1959) *Dictionary of Education* U.S.A. Mcgraw-Hill Book Company.

Ibidapo-Obe, Oye (2007). The Challenge of teacher Education in Nigeria: The University of Lagos Experience. Paper presented at the Second Regional Research Seminar for Africa Organized by the UNESCO Forum on Higher Education, Research and Knowledge in Accra, Ghana.

Okeke. E.A.C (2008). Attainment of the seven-point Agenda: Challenges for teacher education. Lead paper delivered at NCCE National Conference at Federal College of Education. Zaria.

Tahir Gidado. (2006). The UBE program: Issues and challenges and implication for teacher education institutions. Being a Convocation Lecture F.C.E Kano.

Tahir, Gidado (2007). Teacher recruitment. Deployment and retention under the Nigerian Universal Basic Education Act in Ojo, M.O. & Alex A. Maiyanga. Teaching the Teachers: A Festscrift for Kabini Ishyaku Abuja NCCE 1-14

Nwagbo, C.R. (2005) Attainment of Professionalism in Science Education: Competencies and Skills Needed by Biology Teacher. 46th Annual proceedings of science teachers association *of Nigeria*. Pp 183-189.

UNESCO (1986). *UNESCO Handbook for biology teachers in Africa.* France: UNESCO Publishers.

Ukeje, B.O. (1996). Teacher education for national development in Lassa P.N., and Anakweze, C.M, and Maiyanga .*A. teacher education: An imperative for national development*. Kaduna NCCE, 1-8.

KOLA NUT: KOLANUT AS AN EMBODIMENT FOR COMPLETENESS OF THE IGBO CULTURE

Chinyere J. Anidobe and Uche Joy Uzoalor

Abstract

Of all the cultural practices of Ndi Igbo, the use of kolanut (ọjị Igbo) ranks highest in rituals and other social gatherings. In performing these rituals, there is always fair-play especially in the presentation. Presentation of the kolanut is often used as a check on the identity and genealogy of the male folk in any Igbo gathering. The writers also portrayed the kolanut as a true WAZOBIA. In kolanut presentation, the case of some Igbo women that distinguished themselves in the service to the nation was also highlighted.

Introduction

Culture is a people's total way of life which manifests itself in behaviours that have certain factors in common. Such behaviours represent the moral anticipated response of society members' participated responses in music, dance, marriage system, burial rites, religious, rituals and the like. Supporting the above explanation, Maduka, (1980: 253) state that "*the functioning of every part of the human body is molded by the culture within which the individual has been reared not only in terms of diet, explosive ... and experiences but also the way he is born into a society with a definite culture has been fed with disciplined, folded and put to sleep, punished and rewarded".*

No wonder, the BBC English (1992) defined culture as consisting of ideas, customs and art produced of by a particular society. Bearing this in mind, the people's religion includes among other things the rituals, the rites and the likes. Culture can also be seen as an advanced developmental process of the human powers such as the body, mind and spirit through training and experience. It is a complex whole which include language, knowledge, art, religious, beliefs and practices, code, institutions, traditional moral code, law and general philosophy of a race or community. Simply put, culture is the totality of a way of life of a people. That is the way they do their own things.

Kola nut in this paper is studied, established and presented as an embodiment of a necessity for completeness of the Igbo way of life. Igbo culture is incomplete without the kola nut. In fact, kola nut is so important in Igbo cultural symbol that there is no cultural symbol that has received an equal attention as it has. In the words of Ubesie (1978:10), there is no known town in Igbo land that can boast of having and fulfilling all the traditions with which the Igbo are known. But there is one tradition that is universal among the Igbos and that is the use of kola nut and not one can say how and when this started. There is a popular but cheap etymology of kola nut, Ọjị: O = Omenala (custom), J = Jikotara (that unites), I = Igbo. Therefore, to sum it up, Oji means "Omenala jikotara Igbo" (custom that unites the Igbo).

Origin of Kola Nuts

It is not quite clear when and how kola nut came into Igbo land; but it is among the many nuts found in West African sub-region. In Nigeria up to twenty species of kola are recognized. These fall into four sub-general groups. Bodard (1954) group it thus; parvosema kola, haplo kola, macro kola. Of these, the sub-genus kola is the most widely cultivated and it has more than a hundred species of which only four are edible. The edible species are kola verticillata, kola megalcophylle, kola nitida and kola acuminate. The last two are the only species grown in large scale in Nigeria.

Kola acuminate otherwise called "Ọjị Igbo' by the Igbo has lobes or cotyledons ranging from three to seven or even more. It is the specie eaten and respected by the Igbo. Nitida otherwise called "Ọji Awusa" by the Igbos or "gworo" by the Hausa has just two lobes or cotyledons.

Kola nitida and acuminate are well grown on large scale by the western Nigerians, eaten on a large scale by the Hausas of Northern Nigeria while it is well revered by the Igbo of the eastern Nigeria. No ritual or traditional performance is complete without the presence of the kola among the Igbo.

According to some Igbo traditional rulers, kola nut and the tree are the first trees created by God. And as such it is sacred by nature. Because of its sacredness, the dry wood of kola tree is not used as fire wood in Igbo land.

Interpretation and Significance of the Kola Nut in Igbo Communities

In Igbo land, any Igbo traditional setting, be it ritual or any other ceremony, the kola nitida that is Oji Awusa or group has no place. This specie is regarded as invalid. The only species that is recognized by the Igbo in their rituals and ceremonies is the kola acuminate known as "oji Igbo." Kola is seen among the Igbo as a symbol of life and unity. Hence the common saying by the Igbo that he who brings kola brings life 'O wetara oji wetara ndu', Achebe (1958: 14). For this reason, many profound and mysterious interpretations and formalities are accorded it. One significant feature of the "Oji Igbo" (kola acuminate) is that it has lobes or cotyledons ranging from three to seven or even more in some occasions. But if by accident or otherwise a kola nut happens to have no lobe, it is regarded as 'ọjị ogbi' that is, dumb kola. This type is taken as 'ọjịmuo' – kola for the spirits. This is not eaten but thrown away to the spirits. In addition, any 'ọjị Igbo' with two lobes is also not eaten but thrown away. In some cases, the parties concerned go for a diviner for clarification and appeasement of the gods/spirits (Nwapa, F. 1968).

In some parts of Igboland, kola nuts with three lobes are referred to as "Ọjị Ikenga" which means kola nut for the valiant, heroes and achievers. Ikenga is known and taken by the Igbo as a symbol of achievement; as such, such kola nut with three lobes is eaten mainly by warriors, the brave, the achievers, the ordained and consecrated as a matter of principle and respect.

Also, majority of Igbo communities regard kola nut with three lobes as "Ọjị Okike." Among the Igbo, "Okike" is the creative deity. For this, a kola nut with three lobes is regarded as a symbol of fertility. Kola nut with four lobes signifies the Igbo native week of four days – Eke, Orie, Afor and Nkwo which also represent the four market days in every part of Igbo land. In some Igbo communities, the kola nut with four lobes is called "Ọjị udo na Ngozi" that is kola nut of peace and blessing.

Furthermore, kola nut with five lobes is regarded as good luck especially to the person that broke it. It is called 'ọjị ubara mmadu, omumu na ukwu oma" which means the kola nut of increase in procreation, fertility and good luck. On the other hand, a kola nut with six lobes shows communion with the ancestors that is "oji ndi mmuo na mmadu jiri gbaa ndu'. On breaking this, all the lobes are not eaten rather the smallest is selected and thrown out for the spirits and gods. This attitude shows direct link between the Igbomen and his ancestors. That is link between the living and the dead.

Ascending a kola nut with seven lobes is regarded as ultimate and signifies perfection. Therefore, before this is eaten, the oldest man in the village will have to offer sacrifice to the village deity before it is eaten. Where the oldest man is not available the lobes are tied and kept until he is available. When available, he then performs the rituals which are more of thanks to gods before all that are present will then partake. In some areas, this type of kola nut is accompanied with a big cock. Where the cock is not available, the said kola nut is kept until the cock is produced by the host. The cock when produced is then killed and cooked. The kept kola nut is then brought out and shared with the cooked cock among those present.

Respect Accorded to the Kola Nut (Ọjị Igbo) in Igbo Land

In the first place, this species of the kola nut under review is the only one revered and used for rituals and other Igbo ceremonies. For this, a lot of respect is accorded to it. In most Igbo communities, it is an abomination for a woman to pluck or even pick a kola nut even if the tree is hers where she is privileged to own one. On seeing a mature one, she has to find a male to do it for her no matter how young the male is. Where a woman does it herself, it is regarded as an abomination that should be cleansed. The gods must be appeased. Theft associated with yam tubers and coco-yam are regarded as sacrilege against the gods. So people who are involved in such thefts are not allowed to break kola nut in any gathering until the gods are appeased and such people certified clean.

Because kola nut signifies communion between the gods and man, any man that committed an abomination in the community is not allowed to break kola nut or even partake in the eating in some communities. Moreso, in any Igbo gathering, an Osu or Ohu must never break or bless kola nut among the amadis (free born). Kola nut can never be substituted although some other things could

be used as kola nut for a visitor but those things are not respected, honoured nor are they used for rituals. I mean things like; Amara, mmiri, wine and the like.

Ironically, a woman that nurture and brings out kola nut in a gathering is not allowed to break it. Kola nut is not even shown to her when it is passed around. This is termed an abomination in a normal Igbo gathering of men and women. All these are so because of the high status given to kola nut (Ọjị Igbo) in Igbo land. The principle that woman should be seen and not heard, is fully applied here.

Presentation and Breaking of Kola Nut in Igbo Land

The presentation of kola nut is so important in Igbo world view that a host who could not present it to his guest is usually full of profuse apologies. However, such apologies by a host are taken as a demonstration of goodwill and hospitality. This presentation of kola nut to a visitor or a group of people does not only signify goodwill and hospitality but also symbolizes an act of respect. In Igbo land, ọjị is the first thing served in every function or ceremony, be it personal or communal. It may be for welcoming a visitor or for settlement of a family dispute. Immediately after the usual prolonged greetings in the traditional manner, kola nut is presented in a dish or wooden platter specifically made for kola nut presentation. There may be one or more kola nuts in this platter. The host then first receives the kola nut from his wife or servant as the case may be. He takes one, touches it on his lips as a sign of offering it in good faith and free of malice. The platter is then passed to the visitor who touches that and then returns to the host for blessing and breaking. This goes on with a lot of talk (Achebe, 1978; 94-95).

In some Igbo communities, the visitor takes one of the nuts and pockets before returning the dish to the host for blessing of the remaining one. The one taken by the visitor is called "Ọjị rue ulo, o kwuo onye chere ya", meaning when the kola nut reaches home, it tells person that presented it. In a community like this, if you have just one kola nut in the platter dish, the host normally accompanies it with some amount of money; just a token and this is taken by the visitor as a kola nut that will be taken home.

The social aspect of kola nut and the long talks that go with it is more symbolic when many people are to partake in the eating. On presentation, the Ọjị is carried from one person to another according to a trace of kingship starting from the home of the host. It then moves from left to right and then back to the host as the case may be. This is a way of checking the identity of all the people present before any discussion is made. In the course of this, if one made the mistake of carrying the kola the wrong way (ipa ọjị), he is traditionally corrected. Such mistakes are frowned at. This is one of the ways by which the Igbo youths are trained.

Blessing of the kola nut that is "ịgọ ọjị" is the sole right of the eldest person in any gathering, or that right may go to the Eze/Igwe (King) as the case may be. However, the eldest is preferred in most cases because he is the custodian of truth and regarded as the closest to the ancestors. The principle behind the kola nut culture is that it cannot be taken without saying of prayers or incantation in a gathering. The eldest in addition to his wise sayings normally request for peace, prosperity, long life, protection from all ills among other things. The share for the spirits (the radix) is then thrown to them and all present share the rest.

The kola nut (ọjị) in Igbo land is a veritable symbol of democracy. In the sharing, no one is cheated. No matter how small the quantity is, it must go round. Hence the saying 'mboaka o no ebee mere na ọjị ezughi" meaning where is the finger nails that the kola nut was not sufficient. It is argued that kola nut sharing practice is the only Igbo social institution that does not discriminate in terms of class or status.

Apart from the functions of democracy and unity which the kola nut performs for the Igbo, there are other functions this sacred fruit performs. In covenant keeping, it is of vital importance. It is called igba ndu in Igbo. Here the two people or parties as the case may be are expected to eat kola nut with their own blood as sauce. But in some cases, the kola is not eaten rather, they just hold it and say what the covenant is. The belief is that there is nothing stronger than human blood. This was used by cultists in the olden days. Once, this is done the deal (covenant) is sealed. Both parties will then aspire to keep the covenant. Breaking it means breach of the covenant and that is termed abomination. To appease the other person or parties or even the gods, the kola nut must be brought in again.

The kola nut is also used for oat-taking. At times in some Igbo communities, when certain things that are bad like; the theft of yam tubers, poisoning, secret willful destruction of farm crops and the like start happening, the need for oat-taking comes in (Ubesie, 1978:10). 'The procedure is that the suspect are brought out in an open place preferably "ama" or market place, or shrine of a particular deity to take the oat (ịnụ iyi). Kola nut is placed on the ground and after some incantations and sayings, the suspect is expected to crawl to where the kola nut is and picks it with his/her mouth. The belief is that if the suspect committed the said crime, he will happen to him. He will then come out, go round town to declare his innocence. This will be after some stipulated days – "Izu asaa" that is 28 days. Where someone is suspected of poisoning another person, in some areas, on the burial day, a lobe or lobes of kola nut will be placed on the body of the decreased and the suspect(s) is made to take the lobes with the mouth. If actually the offence was committed by the suspect(s) their sins will find them out within a space of time. Thus, they are punished accordingly or even pay with their lives in some cases.

For an Igbo man, food is of vital importance. Because of this, in a typical Igbo setting, the first thing a man does is to bless and eat kola nut. The eating is called "Igba azi." This is just an appetizer (foundation for other foods). This can carry him far into the day before any other thing finds into his stomach. The belief is that if the man travels out with an empty stomach and meets an angry god seeking for one with an empty stomach as a bait, he will be free because he has something in his stomach.

As an energizer, kola nut is also used. Renounced Igbo orators have been known to keep awake to recite their speeches through the help of kola nut (ọjị). Man is a social being and the Igbo is not an exception. In interaction, there is bound to be problems. When an Igbo of the lesser status has a problem, he goes to a richer person for help. He does this with some kola nuts. A non Igbo may just see it as mere kola nuts, but for an Igbo, it has a lot of connotations. In the first place, it is a sign of respect to the reach person. On the part of the beggar, it shows humility. So from the aforementioned, we have seen that kola nut is highly held and performs a lot of functions both religiously, socially and otherwise in Igbo land.

Conclusion

In the process of this paper, it was noted that there are many species of kola nut but the specie that is relevant to the Igbo is the kola acceminata (ọjị Igbo). Looking at the symbolism accrued to it, we noted that it is used as a symbol of reconciliation, covenant keeping, oat-taking, respect and appetizer. It is also a symbol of hospitality, life, peace, kindness, goodwill, commensality, fraternity and integrity.

The kola (ọjị Igbo) is a typical multi-referential social symbol while the eldest blesses, the youngest breaks and serves in a social gathering. It is the exclusive right of the priest to break kola nut during Igbo rituals to the Arusi or god. The honour, respects, high regard and attention given to kola nut (ọjị Igbo) by the Igbo reveal that it is part and parcel of the Igbo cultural identity.

Recommendations

In the course of this paper, it has been seen that the kola nut is the true "WAZOBIA", cultivated in the West, eaten by the Hausas and highly respected and ritualized by the Igbo. So it could be used for national unity. It was also seen through this paper that the sharing of kola nuts reflects that of federal character where everybody gets a fair share. There is no marginalization in the sharing. So this should be emulated by the nation. That no one be oppressed.

But it was discovered that to some extent, kola nut is male oriented – women should be allowed in to some extent. In areas where women are highly discriminated upon, women should be allowed to own kola nut trees freely, pluck and pick the fruits. In "ipa ọjị), women should be shown the kola nuts in a gathering just as their male counterparts. The idea of a woman bringing out kola nut, hands it over to her husband but in passing around and other things she is relegated to the background does not look sensible. It should be made as part of those privileges women enjoy in this 21st century. Moreso, we have some women that have distinguished themselves out. An Igbo adage says; "Nwata kwochaa aka, o soro ogaranya rie nri", meaning that if a child distinguished himself out, he will dine with the rich.

References

Achebe, C. (1958). *Things fall apart* London: Heinemann educational publishers.

Achebe, C. (1978). *Arrow of God.* London: Heinemann educational publishers.

Akinbode, A. (1982). *Kola nut production and trade in Nigeria*. Ibadan NISER

Eze, S.N. (unpublished 1985). Research and comment on Igbo culture

Nwankwo, T.N. (unpublished 1982). The Nri and right of breaking kola nuts; Resolving issues of prerogative among the Igbo of Nigeria.

Nwapa, F. (1966). *Efuru* London: Heinemann educational publishers.

Nzeako, J.U. (1979). *Omenala ndi Igbo.* Ibadan: Longman Nigeria Ltd.

Ubesie, T.U. (1978). *Odinala ndi Igbo*. Ibadan: Longman Nigeria Ltd.

Ukaegbu, J.O. (1991). *Journal Igbo identity and personality vis vis Igbo cultural symbols. Salamanca*

CHALLENGES OF USING SCIENCE AND TECHNOLOGY AS AN INSTRUMENT FOR NATIONAL DEVELOPMENT IN NIGERIA.

G. S. Mete

Abstract

Science and Technology are crucial to any a nation's economic, political an social development. Scientific literate politics as well as Science and Technology professionals are required to achieve UN Millennium Development Goals for human welfare. This paper focused on the context of seven-point agenda of Science and Technology Education, uses and of Science and Technology Education to the seven-point agenda, problems of Science and Technology in Nigeria, challenges of Communicating Science and Technology and the way forward as an instrument for achieving the seven-point agenda for national development. Recommendation were finally pointed out, such as, special incentives should be given to Science and Technology teachers as encouragement to take up the challenge, the government should live up to expectation by adequately funding Science and Technology Education, and so on.

Introduction

Science and technology are crucial to any nation's economic, political, and social development which can positively touch on every facets of human endeavour when properly developed and applied. In one of the research findings, Nyoku (2004) indicated that science and technology is not "wishful thinking" but a desire backed by law through appropriate government policies and these make science executor and scientific research rewarding both for the individual and the society. Progress in science and technology offers dramatic opportunities for providing a safer, more prosperous and sustainable world for people everywhere. Nigeria's efforts at development since independence in 1960 have seen a number of well articulated national development plans. However, among the recently developmental targets include, Millennium Development Goals (MDGs), Visions 2010 and 2020, and National Economic Empowerment and Development Strategy (NEEDs). Effort to achieve national development through previous development strategies have been unable to yield the expected results. A ray of hope in the form of the Seven – Point Agenda of the present Nigerian Government led by President Yar'Adua has risen against this uncomfortable background. President Yar'Adua has adopted the agenda as his most immediate area of focus for the development of the nation.

This paper examines and focuses on the context of Seven – Point Agenda and uses of Science and Technology Education to the Seven Point Agenda, problems of Science and Technology in Nigeria, challenges of communicating Science and Technology, and the way forward as an instrument for achieving the Seven - Point Agenda for National Development.

The Seven - Point Agenda in Context

The Presidency, 2007 gave items of Seven - Point Agenda as power and energy, food security, health creation, transport sector, land reforms, security and education.

According to Ochiama, 2008, the President Yar'Adua, in his inauguration speech enumerated the Seven - Point Agenda as power and energy, food security and agriculture wealth creation and employment, mass transportation, land reforms, security, qualitative and functional education and pursuance of the rule of law. Recent information from a source in the Presidency (unpublished) listed the items of the Seven - Point Agenda as electoral reforms, electricity and power generation, health, human rights, agriculture, fight against corruption, and education. However, the following aspect of the Seven - Point Agenda of President Yar'Adua have been selected for further discussion in this paper.

1. Electricity Reform
2. Health and Security

3. Power and Energy
4. Mass Transportation
5. Agriculture and Food Security
6. Education
7. Wealth creation and Employment.

Electoral Reform

Nigerians expects the electricity reform to solve the following problems:

(i) Every voter's to be counted made to count
(ii) Under aged voting to be eradicated
(iii) Number of political parties to be reduced drastically at least to two.
(iv) Specific rules and regulations shall be made to guide the operations of INEC staff whoever participates in electoral work, the breaking of which should attract clear punishment by law
(v) The Independent National Electoral Commission (INEC) to be made truly independent.

Health and Security

Nigerians are confronted by massive health problems which were sometimes shown by even coup plotters in an attempt to justify their reasons. Three of the eight Millennium Development Goals adopted by the United Nations (United Nation Secretary-General, 2007) and of which Nigeria is a signatory are health-based and are to be achieved by the year 2015. In addition, the justification for having "health" among the Seven - Point Agenda is that the link between health is so close that most security problems are also health/life problems.

The total sum of N138.17 Billion representing an increase of 12.5% over 2007 allocation was allocated to health sector in 2008 budget for the rehabilitation and equipment of Federal Tertiary Health Institution, National AIDS/STI Control Programmes, National Programme on Immunization and Capacity–building and training for health workers, all in line with MDGs.

Properly and economic interests in the Niger Delta, quick industrialization and job creation for youths in the area are being suggested by industrialists on the security breaches on life (Ochaima, 2008). Infact, the allocation of N69.9 Billion to the Niger Delta Development Commission in the 2008 budget which is 19.1 & higher than that of 2007 is a step forward in the right direction. The Nigerian people cannot be contended with any backward-looking leadership in this era which is undoubtedly driven by Science and Technology.

Power and Energy

Actually, power failure and blackouts have become the order of the day throughout the country in schools, homes, offices, and business centers, not to talk of industries. Ochiama (2008) reported a very low generating capacity relative to insolated capacity in the power sector with the current electricity generation in the region of about 3,000 Megawatts, while the current estimated national consumption need is at least 25,000 Megawatts, with the potential demand estimated at 100,000 Megawatts. However, following the President's concern for the power and energy sector, the sum of N139.78 Billion was provided in the 2008 budget for the development of infrastructure and this represents an increase of 15.6% over the 2007 allocation (Oota and Adah, 2008).

Mass Transportation

No matter how many motor vehicles we have on our roads, they would never be enough or mass transportation needs of 150 million Nigerians and their goods moving to and fro different geographical regions.

Over-resilience on mass transportation by road may have been indeed responsible for the perpetual rise in the cost of goods, food and services, resulting to increase in hunger and poverty in Nigeria.

The reform in mass transportation should include the development and maintenance of a proper rail system, repairs of roads and construction of new ones as well as development of water transport.

Agriculture and Food Security

Some programmes of past governments such as Operation Feed the Nation and Green Revolution came and went without solving the problem of millions Nigerians suffering from extreme hunger from year to year.

According to the Presidency (2007), the reforms places emphasizes on development of modern technology, research, financial injection into research production and development of agricultural inputs so as to revolutionize the agricultural sector.

Education

The first aim of the reform in the education sector is by ensuring the minimum acceptable International Standards of Education for all.

The second aim of the reform is a strategic education development which will ensure excellence plan in both the tutoring and learning of skills in science and technology by students who will be future innovators and industrialists. To achieve this reform government should massively inject funds into education sector.

Wealth Creation and Employment

This reform is aimed at emphasizing development in the non-oil sector in order to create wealth and empowerment through various productions particularly in agricultural and solid minerals sectors. According to the Presidency (2007) all these requires Nigerians to choose to work, as hard work by all is required to achieve this reform.

Uses of Science and Technology Education to Achieve Seven – Point Agenda

On electoral reform, their use will help to identify the electoral process by which the vote of every Nigerian voter may be counted without addition or subtraction and reflected in the final results that will determine the winner. Prior to the last election various voting options including electronic voting machines were considered before INEC settled for what it used so badly. As much as Nigerians become scientifically literate through qualitative Science and Technology Education, they will inculcate the scientific attitudes of honesty, respect for truth and logic, open mindedness , tolerance etc, which will enable them to shun electoral malpractices and Nigeria will consequently achieve the agenda of the electoral reform.

Health and security reform can benefits from various aspect of Science and Technology. For example, the main operators of health aspects are well trained medical doctors, nurses, laboratory technologists and other auxiliary staff – all with Science Technology training. In the aspect of security we have the law enforcement agencies whose mode of transport, communication and weapons are products of Science and Technology.

In respect of power and energy, Science and Technology is the main driving force for its actualization. Increasing the current electricity generation capacity of about 3,000 Megawatts to at least 25,000 Megawatts required a great deal of scientific, technological and related managerial inputs to actualize. It is also our experts in the science and technology of power and energy who hold the key to the diversification of sources of power generation.

The mass transportation reform requires a standard gauge rails or revamping of old ones, new roads or massive repairs of old ones, development of air and water transport. Executing all these require planning, designing, construction, operation and management, all of which rely on specialized training of scientists and technologists.

The agriculture and food security reform can benefit from various science and technology education inputs. For example, the production maintenance and servicing of tractors and other mechanical tools and implements to be used in large scale mechanized farming is the work of technologists and technicians.

The education reform which is aimed at providing Universal Basic Education for all citizens and the training of skills in Science and Technology by students who will be seen as the further innovators and industrialists of Nigeria. This is achievable only through the provision of qualitative and functional Science and Technology Education. The reform on wealth and employment relies heavily on other reforms. For example, the success of the agriculture and food security and mass transportation reforms will create more employment opportunities and bring wealth to more

Nigerians. The electoral reform will also bring more employment and wealth to Nigerians because people will have leaders they want and who want and care for them and their need for a legitimate means of making a living from national resources meant for the welfare of the people.

Problems of Science and Technology in Nigeria

According to Njoku (2004) a number of problems beleaguer the advancement of Science and Technology in Nigeria and such problems includes:

Poor Maintenance of Equipments: In a situation where some equipment is available poor maintenance has limited the utility of such equipments.

Un-utilized / un-realized capacities: This is commonly observed in agriculture. For example the best seed stock in Nigeria has only one third the potential of the best variety of the seed. When this is combined with high loss through poor development of appropriate storage facilities, Nigeria is unable to attain food security despite the immense capacities in human resources and positive environmental factors:

Death of Equipment

Some equipments are either out of used or not available in the right quantity and quality.

Conclusion

The President Yar'Adua;s government Seven - Point Agenda is really a great visionary leap for the Nigerian people economic emancipation. There are serious problems and challenges as far as communicating Science and Technology to unscientific world is concern. In this regard, this paper is of the view that all stakeholders, especially the government of Nigeria to nurture an environment which should be scientifically and technological friendly to research and dissemination. Also in this paper, the Seven -Point Agenda were examined in context, the various ways in which Science and Technology Education may contribute towards the actualization of the Seven-Point Agenda, challenges of communicating and Science and Technology and the way forward were identified and discussed.

Recommendations

1. Scientifically, literate publics as well as Science and Technology professionals needs to achieve both the UN Millennium Development Goals for human's well-being, and aspiration of individual nations for development.
2. The Scientifics community needs to communicate the objectives that it pursues and the implications of scientific discovery to the public.
3. According to the International Council for Science Policy Studies (1992) a well informed public can ensure scientifically informed policy.
4. Communicating science to the public involves various forms and informal channels, including scientists themselves, public information officers, science journalists, centres and museum, schools libraries electronic games and other media tools.
5. In Nigeria, specialized journalism has received a lot of boost in the last fifteen years (Ekanem, 2005). The greatest challenge facing the task of communication science information is the unfriendly environment in which stakeholder have to operate it. Stakeholders have spent financial resources in order to receive the attention.
6. In Nigeria, of all the National Newspapers, only the Guardian and a few others have kept faith in reporting a steady, regular column for scientific discourses (Ekanem, 2005). In several cases, editors have been known to authorize the replacement of a science page with an advertisement paid at the closing hours leading to production. Infact this is very frustrating not only to the Media personnel on the Science and Technology desk but also to the devoted army of readers and stakeholders.
7. Science and Technology must be harnessed as a means of economic growth in accordance with acceptable moral and ethical obligations.

8. Nigeria must nurture environment which will attract talents to the Basic and Applied sciences and recognize and reward scientists to promote and retain human capital
9. New and emerging fields such as Information Technology, Biotechnology and material science must be given due consideration by curriculum developers at all levels of education.
10. Transitional sources of food must be complemented by modern scientific research and technological innovations in order to ensure food security for all in this 21st century.
11. The quality of laboratories in our schools should be improved.
12. Individual scientists and scientific organizations should have a much more vigorous effort to widely communicate the science to the public contributions of science to the public.
13. Government should introduce more substantive and directional Introductory Technology courses at the primary level for development of culture that is positive towards technology.
14. Scientists should be actively involved in this dissemination of research results.
15. The government should live up to expectation by adequately funding Science and Technology Education
16. Special incentives should be given to Science and Technology teachers as an encouragement to take up the challenge.
17. Also scholarships should be given to Science and Technology students.
18. Laboratories should be adequately provided and be well equipped
19. Special funds should be provided for Research and Development in Science and Technology.
20. Science allowances should be provided to Science Teachers to attract brilliant Nigerians to teach Science and Technology courses in schools.

References

Abah, C.O.(2008). Science, technology and mathematics education: A Key Driver to achieving the Federal Government's Seven-Point Agenda. A lead paper presented at the 2008 Annual Conference of the School of Science, Federal College of Education, Zaria. 7th – 10th April, 2008.

Ardo, G.V. (2008). Leadership, globalization and development in Nigeria: The imperatives of science, technology and mathematics (STM) education. *A* key note address delivered at the school of schools, Federal College of Education, Zaria. 7th – 10th April, 2008.

Ekanem, I. (2005). Communicating Science Information in a Science Unfriendly Environment: The experience of the Nigeria Academy of Science. Science and the media.

International Council of Science for Policy Studies (1992). Science and technology in development country: strategies for the 90s. A Report to UNESCO, Paris.

Njoku, P.C. (2004). Science and technology education in Nigeria. Prospects, problems and the way forward. Retrieved from wwwplacidnjoku.com

Ochiama, C. (2008). Yar'Adua's 7 – point agenda. a performance assessment. Retrieved from Http*://naijainfablogspotcom/2008/02/Yar'aduas–7–point- agendaperformancehtmi*

Oota, A. & Adah, J. (2008). Yar'Adua's Administration Budget and the seven-point agenda in Nigeria. Abuja. *Leadership Analysis*.

The Presidency (2007). The Yar'Adua's Seven-Point Agenda. Press released by the Presidency. 10 August, 2007. Retrieved from *htt://nigeriawordpages.com /indexoption-com-content and task – view*

United Nations Secretary General (2007). The UN millennium development_goals. Retrieved from http://www.un.org/milleniumgolas.

SIMPLIFIED MODELS FOR THE PREPARATION AND PRESENTATION OF SMALL AND MEDIUM ENTERPRISE (SME) FINANCIAL STATEMENTS

Roman O. Omorokpe

Abstract

The immense contributions by the Small and Medium Enterprises (SMEs) to national income has necessitated a model format for the preparation and presentation of Annual Reports and Financial statements for the SMEs. The models suggested in this paper are geared towards improving the quality and usefulness of financial statements prepared and presented by the SMEs. The models will also serve as guide to Accounting Standards Setter (Nigerian Accounting Standard Board — (NASB) when formulating Financial Reporting Standards for Smaller Entities (FRSSE) in Nigeria. The article is of the view that SME operators or managers should be transparent as far as practicable when-disclosing information to users of their financial statements.

Introduction

Accounting or financial information about a business enterprise large or small, is required by a variety of user. This need dictates the fundamental objectives of accounting and the mode of reporting information. Moreover, firms, or enterprises carry on business activities in a given and dynamic economic, social and political environment and there is public interest in their operations. For instance:

Individuals, financial institutions or group of investors need accounting or financial information to determine the liquidity, profitability and viability of the enterprise.

i. Business managers and owners need accounting information to measure performance, plan and control operations, and to make good business decisions.

ii. Employees and customers of an enterprise need accounting information in order to assess the ability of the enterprise to produce goods or to render services on a continuous basis.

iii. Governments and regulatory agencies need accounting information in order to be able to impose and collect taxes, to regulate certain business activities and to plan, execute and evaluate public projects (SAS 2).

Financial statements as means of communicating to interested parties, information on the resources, obligations and performances of the reporting entity or enterprise are expected to be simple, clear and easy to understand by all users, according to the 'SAS No.2 on Information to be Disclosed in Financial Statements.' Information contained in financial statements are usually prepared according to generally accepted accounting principles (GAAP). GAAPs require the use of accruals method of accounting. However, there is a question of whether GAAP is applicable to small and medium enterprises (SMEs) and whether GAAP, meets the needs of these enterprises, as well as of the preparers and the users of their financial reports. The next part of this article examines the meaning of SME, the sources of fund available to the SME, problems associated with the preparation and presentation of SME Financial Statements followed by suggested models for application - using hypothetical figures.

The Meaning of Small and Medium Enterprise (SME)

Defining the term 'small and medium enterprise (SME)' is not an easy task. At first, this appears very easy to answer. But a closer look contradicts this belief. As one visit many of these places of business-such as barbing saloons, small shops or stores, dry-cleaners, video and record rental shops, dentist, private clinics, maternity houses, fast-food restaurants, estate valuers and other professional offices, etc, one would find that defining small business or SME is not an easy task (Udi and Omorokpe: 2006). It therefore depends on how individuals view it. Some firms may be big when viewed on itself, but small when compared with other companies in the same industry. Such company can safely be classified as a small business or small company.

Different schools of thoughts and writers on business have offered varied definitions of small and medium enterprise using such indices as:

a. Total investment cost,
b. Level of turnover,
c. Size of the workforce, as decided by labour leaders,
d. Independently owned and operated,
e. Not dominant in its area of operation,
f. Does not engage in new or innovative practices.

Viewing it from the present Nigerian industrial situation, small-scale enterprise could be defined as a business entity that has less than one million Naira (₦1,000,000) total assets value, and with not more than twenty (20) employees. It could be safely assumed as observed that the Nigerian economy is largely dominated by small and medium scale businesses. They are established and run by individuals, groups, families, co-operatives or as companies. It is important to note that most large companies started small.

Because of SME crucial role in economic development of a nation, it becomes very important to have a standard definition of small-scale enterprise to act as a guide to both financial operators and owners of such business activities. To this end, the Bankers' Committee on SME-Nigeria (2005) comes out with a definition of .Small and Medium Enterprise. It defines SME as 'any enterprise with a maximum asset base of five hundred million Naira (₦500 million), excluding land and working capital, and with no lower or upper limit of staff.

Definitions in this field of endeavour change over time, and more importantly, depend upon a nation's level of development. But relevance to Nigeria, the Companies and Allied Matters, Act (CAMA) -2004, as amended, stipulates that a company qualifies as 'small company' if it satisfies the following conditions in a given year:

a. It is a private company having a share capital,
b. The amount of its turnover for that year is not more than ₦2 million or such amount as may be fixed by the Corporate Affairs Commission (CAC),
c. The net assets value is not more than ₦1 million or such amount as may be fixed by the Commission,
d. None of its members is an alien,
e. None of its members is a Government or a Government Corporation or agency or its nominee, and
f. The directors between them hold not less than 51 per cent of its equity share

Capital" (CAMA, 2004, section 351).

Sources of Funds

If a business is to operate effectively and expand, it needs an appropriate level of assets, and therefore a flow of cash (funds) into the business with which to acquire the assets.

The sources of such cash must be capital or liabilities or both, and the various forms of funding available to SME are as follows;

a. Short- term credit (e.g. Current Liabilities)
b. Long-term borrowings (e.g. Long-term Liabilities)
c. Capital introduced by owners/shareholders
d. Profit generated by the business.

Examples of Current Liabilities are:-

- Trade creditors - for goods purchased on credit by the entity.
- Accrued charges for services enjoyed but not yet paid for (e.g. Electricity bills)
- Taxation payable, i.e. Tax due to the government but not yet settled.
- Bank overdraft, i.e. money borrowed from bank on current account so that interest is charged only on the amount outstanding each day. It is a form of stand-by credit.

- Dividends payable (by incorporated businesses) i.e., money set aside out of profit but not yet paid to the shareholders or owners.

Examples of Long-term Liabilities are:-

- Creditors for goods or equipment bought on hire purchase (H P), lease etc.
- Secured and unsecured bank loans and other Long-term loan.
- Debentures, which are securities issued by a limited Liability company for money borrowed on the company's fixed assets or properties having a fixed rate of interest and usually fixed redemption (repayment) date. HP is an example of direct reduction loan which requires the borrower to repay the principal and the interest in uniform installments throughout the life of the loan.

Profit

Profit is the most important source of fund for the growth of business. To make profit, it is necessary to have achieved an excess of Income over Expenditure so profit means additional cash, which means additional assets. Note that profit belongs to the owners of the business, and so increases their capital.

Capital

This means the actual amount of money or money worth brought into the business by the proprietor or entrepreneur from his outside interest, or private savings. The capital of a limited liability company is termed the ordinary or equity share capital. The capital of an existing business consists of the assets (what is owned by the business) less the liabilities (what is owed by the business to others). It is a long-term resource of the enterprise.

It should be noted that the financing source that is common to all forms of business enterprises- incorporated or unincorporated, is 'trade credit'. Trade credit is buying goods or receiving services on credit.

Problems Associated With SME Financial Statements Preparation and Presentation

The major problems that may hinder the preparation and presentation of SME financial statements process include;

a. lack of skill in finance and accounting,
b. Inadequate financial records.

Skill in Finance and Accounting

Most small business owners lack the necessary skill in finance and accounting. 'It is true to say that if you do not understand finance and accounting, you will not be successful in convincing financial institutions to lend you money and you will not reach your full potential' (Webbs,200l:66). It is important that business people understand the basic process of bookkeeping and accounts, as it is often said that accounting is the language of business.

Inadequate Financial Records

There is paucity of essential financial record in small business enterprises in most developing counties. Adequate financial records are essential prerequisite for granting loan applications by Banks and other Financial Institutions, for example. It also enables both internal and external parties to evaluate the business performance from time to time, and at the end or death of the business.

Suggested Model of Financial Statements for SMEs

Accounting to the UNCTAD (2003); Guidelines on Accounting and Financial Reporting for Small and Medium-scale- Enterprises, the minimum set of primary financial statements that must be presented by SME include the following components:-

a. A Balance sheet,
b. A profit and loss account (or an income statement) and
c. Explanatory notes (or notes to the accounts, i.e., financial statements).

The guidelines went further by saying that enterprises may wish to include other statements that are likely to enhance the overall transparency and quality of the enterprise's provision of information to users, for example, a cash flow statement.

A cash flow statement is a classified list of the origins and destinations of cash receipts and cash payments with a business enterprise. From such a list, an insight can be gained into the liquidity, viability and financial adaptability of the business together with its cash generating and absorption mechanisms thus providing a basis for the assessment of future cash flows. Activities found most often in such statement are operating activities, investing activities and financing activities. SAS No. 18 (Nigeria) requires that a statement of cash flow should be part of the financial statements prepared by an organization.

When preparing financial statements for SME, the following procedures should be followed:

1. Financial statements should be prepared on a going-concern basis unless management either intends to liquidate the enterprise or cease trading or services, or has no realistic alternative but to do so.

2. Simplified accruals basis of accounting should be used when preparing enterprise financial statements.
3. The name of the enterprise and the period of accounts, that is, reporting period should be prominently displayed on the Balance sheet and the profit and loss account (income statement) and/or any other relevant statement to be presented. This is in accordance with the 'entity' and the 'periodicity' concepts in accounting.

4. Financial statements should be presented at least annually. This is also a requirement of the Companies and Allied Matters Act (CAMA), 2004, as amended.

5. The enterprise should present current and non-current liabilities as separate classification on the face of the Balance sheet. A non-current liability is another term for Long-term liabilities such as loan or other form of debt that is of Long-term duration.

6. A statement in the form of schedule of fixed assets, should accompany the Balance sheet, indicating the year or period, column for disposal during the year, column for gross amount or cost, depreciation amount and the net book value (NBV) of the assets at the end of the period.
7. An item of property, plant and equipment (PP&E) should be measured at its costs. The costs include purchase price, import duties (if imported) and any directly attributable costs for its intended use, any trade discount and rebate are deducted in arriving at the purchase price (SAS3). Value Added Tax (VAT) must also be excluded.
8. Movement on owner's equity should be disclosed during the financial year.
9. The term 'turnover' should be used to describe the total sales revenue of a trading enterprise net of discount, while the term 'Gross income or Gross earnings' should be used for service rendering enterprises. VAT must be excluded
10. Inventories (stocks-in trade) should be measured at the lower of cost and net realizable value, that is, the estimated selling price in the ordinary course of business less the estimated costs of completion and the estimated costs necessary to make the sale.
11. The cost of inventories should comprise all costs of purchase and other costs (such as transport and manufacturing) incurred in bringing the inventory to their present location and condition.
12. Inventories should be valued using the first-in-first-out (FIFO) or simple or weighted average method. The last-in-first-out (LIFO) or Latest purchase price methods must not be used (SAS No.4).
13. Revenue from rendering of services should be recognized to the extent that the service has been provided.
14. Where there is uncertainty as to the recovery of trade debt, a reasonable provision should be made against trade debts. Such provision must be specific. A general provision is not permitted by the tax authority.
15. Any significant gains or losses should be disclosed separately.

16. The term 'cost of operation' should be used for service rendering enterprise for all costs incurred , while 'cost of sales' should be used to describe the direct operating costs of a trading enterprise.
17. A reconciliation of Accrued Expenses (Accruals) and prepaid expenses (prepayments) should be carried out at year end using the following formats:

Accruals schedule for 20x8 - Using hypothetical figures

Details	Balance brought forward (opening)	Provision addition during the year to profit & loss	Balance carried forward (closing)
e.g. 1. Rates 2. Wages, etc	₦'000 300 5,000	₦ 000 200 4,000	₦ '000 100 1,000
TOTAL	5,300	4,200	1,100

The total balance at close (cf) is represented in the Balance sheet as Accruals under current liabilities.

Prepayment Schedule for 20x8 - Using hypothetical figures

Details	Balance brought forward	Payments during the yea	Charges to profit & loss account	Balance carried forward (close)
e.g. 1. rent (name and address of landlord) 2. Telephone	₦'000 2000 500	₦'000 3,000 1000	₦ '000 4,000 1,100	₦ '000 1,000 400
Total	2,500	4,000	5,100	1,400

The total balance carried forward (c/f) is represented in the Balance sheet as prepayments under current assets.

Annex 1
Model Profit And Loss Account - Where the Enterprise is a Trading Enterprise

Abu Limited
Profit and loss Account for the year ended 31 December, 20x8

	₦'000	₦'000
Turnover		40,000
Less **cost of sales:**		
Opening stock	5,000	
Add Purchases	15,000	
Goods available for sale	20,000	
Less Closing stock	4,000	16,000
Gross profit		24,000
+ other Income, decrease in bad debt, etc (if any)		500
		24,500
Deduct **Expenses** (Indirect costs):		
Salaries and wages	7,000	
Depreciation	2,000	
Lease rent (if any)	4,000	
Motor vehicle expenses	1,500	

Insurance and rates	1,200	
Telephone	2,100	
Electricity	1,300	
General expenses	400	20,000
Profit before Interest and other financial costs	4,500	
Less Interest and other financial expenses		300
Profit after interest and other financing costs		4,200
Less Tax (estimated at 30%)		1,260
Profit after tax for current year		2,940
Profit and loss brought forward		560
Profit and loss carried forward (retained earnings)		3,500

Annex 2
Model Income Statement (for a Service Rendering Enterprise)

Omos & Co
Income Statement for the Year Ended 31st December 20x8

	₦'000	₦'000
Gross earning or income		20,000
Less Cost of operations		13,000
Net profit before tax		7,000
Less Tax (estimated at 30%)		2,100
Net profit after tax		4,900

Annex 3
Model Balance Sheet

Abu Limited
Balance Sheet as at 31st December 20X8

	₦'000	₦'000	₦'000
Assets		**Accumulated**	
Fixed assets	**Cost**	**Depreciation**	
Land & Buildings	3,000	500	2,500
Plant & machinery	2,000	400	1,600
Motor vehicles	1,500	600	900
Furniture & fittings	500	100	400
Total	7,000	1,600	5,400
Current assets			
Stocks		2,600	
Debtor (Net of provisions)		500	
Prepayments		1,400	
Cash		200	
Total Current assets		4,700	
Less **Current liabilities**			
Trade creditors	600		
Accruals	1,100		
Bank overdraft	400		
Proposed dividends (if any)	-	2,100	
Net Current assets			2,600
Net assets (Total)			8,000
Liabilities			
Financed by:			
Authorized capital			

6,000,000 Ordinary share of ₦1each	6,000	
Paid -up capital		
3,000,000 Ordinary shares of ₦1each		3,000
+ Retained Earnings		3,500
Shareholders' fund		6,500
Non -current liabilities		1,500
Capital employed		8,000

Annex 4

Model Balance Sheet Format for Unincorporated Enterprise (Where the Enterprises is Not a Limited Liability Company)

	₦'000	₦'000	₦'000
Assets			
Fixed assets			
Land and Buildings		2,000	
Less Accumulated depreciation		100	1,900
Plant & Equipment		1,000	
Less Accumulated depreciation		200	800
Total Net fixed assets			2,700
Current Assets:			
Stock		50	
Debtors	500		
Less Provision for bad debt	50	450	
Prepayments		50	
Bank balance		30	
Cash on hand		20	
Total Current assets		600	
Less **CURRENT LIABILITIES:**			
Trade creditors	150		
Bank overdraft	50		
Tax payable	40		
Accrued expenses	60	300	
Net Current assets (working capital)			300
Total Net assets			3,000
Liabilities:			
Owners' capital			2,500
Profit (loss) for the year		1,300	
Less Drawings for the year		1,100	
Increase in owner's capital			200
Owner's capital at close			2,700
Add Non-current liabilities: long-term loans			300
Total owner's capital and liabilities			3,000

Notes

Annex I and 3 on model of profit and loss account and Balance sheet respectively are drafted in accordance with the provisions of section 350, CAMA, 2004 which permits the presentation of modified financial statements for small companies by directors,

Conclusion

Financial statements are summaries of gains and losses incurred by the enterprise during the course of its business and investment activities. They are sometimes referred to as 'final accounts'. The proprietors or shareholders, the tax authority and banks need to see financial statements

prepared by business enterprises. Anyone considering buying the business also needs to see the financial statements. Information contained in these statements must be reliable and easy to understand.

Financial statements presented by SME must reflect, as much as possible, a true picture of the financial results and position of the business enterprise at the close of a year or a particular period. Certain transactions which overlap the closing date have to be adjusted. This takes the form of dividing the sum involved in each year ending, and the new financial year about to begin. The nature of the business must be given careful consideration before adopting any of the suggested formats in Annex 1 to 4 above.

Recommendations

This article strongly recommend that the Nigerian Accounting Standards Board (NASB), the apex regulator of accounting practice in Nigeria, should come up with a statement on Financial Reporting Standard for Smaller Entities that will guide the preparation and presentation of SME financial statements. Such standard should ensure that the resulting financial reports are understandable, reliable, and relatively consistent between comparable reporting periods. Understandability is one of the qualitative characteristics of financial statements. If the financial information is not understood by users, it can not be used and thus cannot have value.

Finally, SME operators or managers on their part should be transparent as far as practicable when disclosing information to users of their financial statements.

References

Bankers' Committee (2005). Revised guidelines for operation of the small and medium enterprise equity investment scheme (SMEEIS), April 25, Lagos-Nigeria, Bankers' Committee Reports.

Federal Government of Nigeria (990): *Companies and Allied Matters Act*- 2004, Cap C20 LFN, Lagos, Government Press.

Mike Bonham, *et al* (2004): International GAAP 2005-generally accepted accounting practice under IFRS, London, Ernst & Young /LexisNexis Publications.

Nigerian Accounting Standards Board (NASB):Statement of accounting standard (SAS) No. 2 on information to be disclosed in financial statements (1984), SAS No. 4, on stocks (1986), SAS No. 18 on statement of cash flows (1997) and SAS No. 20 on Abridged Financial Statements, (2001), Lagos, NASB Publications.

UDI G.I. & Omorokpe R.O. (2006): *The practice of small business management & finance*, Benin-City Mareh Publishers.

UNCTAD (2003): Guidelines for accounting and financial reporting for small and medium-sized enterprises, united nations conference on trade and development, New York and Geneva, UNCTAD Publications.

Webb, P. & Webb. S. (2001): *The small business handbook* – The entrepreneur's definitive guide to starting and growing a business, 2nd edition, Great Britain, Prentice-Hall/Pearson Education Ltd.

INTEGRATING ENTREPRENEURSHIP IN THE CURRICULUM OF FINE AND APPLIED ARTS IN POLYTECHNICS

C. N. Nzei and Florence Emelue

Abstract

The present situation where graduates of Fine and Applied Arts from Polytechnics roam the streets calls for a thorough reexamination of the educational system of fine and Arts in Polytechnics. The effect of unemployment, acute poverty and lack of sustainable human development calls for the integration of entrepreneurship education in the curriculum of Fine and Applied Arts in Polytechnics. This paper therefore, looks into how entrepreneurship courses in Fine and Applied Arts curriculum will equip students with the knowledge and skills they need to become self-employed after graduation. The problems were discussed while conclusion and recommendations were also made.

Introduction

With the global increase of technological innovations, emergence of new market economics and changing public roles, there is need for more highly educated, creative and innovative skilled population that will sustain the economic development of Nigeria. So is Fine and Applied Arts, which comprise of Sculpture, Painting Graphics, Textiles, Ceramics and Fashion Design. Every fine artists needs creativity and innovations to participate and thrive in a country like Nigeria. Therefore, entrepreneurship education/training becomes the right instrument that can change individuals and the society for better economic growth.

The term entrepreneurship was derived from two French words "entre and prendre" Entrepreneurship is the ability to set-up business enterprises as different from being employed. This means that this ability acquired should be such to enable us to live a meaningful life and not acquired to enable one secure a paid employment.

According to Momoh, (2007) in today, unlike in the past, paid employment is scarce commodities going by current industry statistics; our tertiary institutions every year produce about 164,000 graduates. And we do not create 164,000 jobs every year. This becomes a big problem to the nation.

Anyakoha, (2006) described entrepreneurship as one who undertakes tasks in a production process. (Esemonu 1998) in Anyakoha defined entrepreneurship as a clear manifestation of effective manipulation of human intelligence as demonstrated in creative performance. Fine and Applied Arts seeks to find out best graduates that can convert their skills to intellectually productive ventures in order to affect the society. It includes creating and building something that has aesthetic values from practically nothing to the benefit of individuals, society and the nation at large. According to Banjoko, (2000) the word art means "to do well" which originated from a Latin word 'ARTT". He defined art as the means of self-expression of "inner" feelings or the idea about things, people and the environment in general.

Polytechnic Education

Find and Applied Arts lecturers and instructors are happy that the students they train graduate in order to function properly in the society. The goals of the polytechnics education as stated in the NPE, 4th Ed. (2004) are:

- To provide the technical knowledge and skill necessary for agricultural industrial, commercial and economic development of Nigeria.
- To give training and impart the necessary skills for the production of technicians, technologists and other skilled personnel who shall be enterprising and self-reliant.

The government is to pursue these goals by ensuring that they will develop and encourage the aims of polytechnic education by including an attitude of respect for the role technology in the society. To accomplish this, students shall be using their hands in making, repairing and assembling

things. This is one of the aims of fine and applied arts because it involves the use of hands for creative ability that will materialize into aesthetic values in a democratic setting. Students' talents must be fully developed to create a great and dynamic economy, so fine and applied education in the polytechnics should be a functional and effective instrument of sustainable development of the students and the nation. The output from our polytechnics is poor; this is as a result of the training given to the students in the school.

Meaning of Curriculum

Wasagu, (2000) defined curriculum as a course, which embraces the total spectrums of content, resources, materials and methods of teaching through which the purposes of education are achieved.

Hass, (1980) defined curriculum as all the experience that individual learners have in a program of education whose purpose is to achieve broad goals and related specific objectives that is planned in terms of a framework of theory and research or past or present professional practice. As a process, curriculum can be seen as the development of educational experiences and activities that will achieve for the students and all members of the society some predetermined objectives that are in accordance with the objectives stated in the National policy on Education.

Curriculum derives its name from Latin word meaning 'a running course', race running on a wager, a race ground or a career. In its original Latin use, it means a 'running' or a course, which one runs to reach a goal.

Curriculum Development

Curriculum development means the process of implementing the theoretical plan to reach educational ends. It is supposed to be well planned so that individuals would familiarize members with what is seen in the society together with its cultural patterns and practices. A curriculum is an educational experience offered to learners in an academic atmosphere.

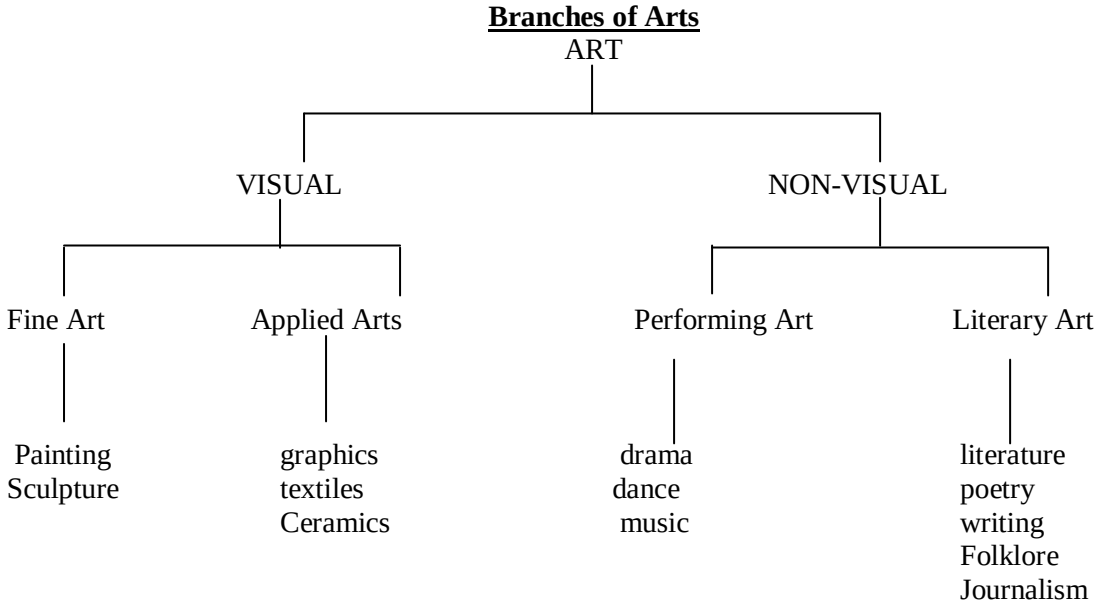
Onwuka, (1996) states that functions of curriculum as:

- To determine the principles and procedures, which will help educators in selecting and arranging instructional programs.
- To determine and assess what changes have been brought about.
- To concern itself with the application of the chosen principles.
- To determine the next step to be taken

Fine and Applied Arts

According to Ogumor, (1993) art is a way of life. It is the power of doing anything. It means any skill, trade, craft or acquired expertise. Art is the study and creation of objects in forms – space, lines texture and colour that gives us pleasure and satisfaction. Art is divided into two.

The Liberal Arts and the Creative Arts: Liberal art embraces subjects in the humanities such as Literature, history, mathematics and philosophy (social sciences). Creative arts is divided into two groups: the performing Arts and the Visual Arts: Performing Arts include Theatre Arts, Music and Dance while Visual Arts include Fine Arts and Applied Arts. This is shown with an illustration below:



Painting: Painting includes drawing and painting of pictures, still life, plants or animals, portraits and mural/wall decoration.

Sculpture: Sculpture involves molding or modeling, casting, carving of object figures and welding.

Graphics

Graphics: Graphics includes drawing and designing posters, greeting cards, advertisements and various methods of printing photography.

Textiles Design: Textile design includes designing of patterns for cloths as well as printing of the designs on fabric, making of tie-dye, batik, cloth weaving and knitting.

Ceramics: Ceramics is the molding and firing of utensils, pots, making wall and floor tiles, bottles and glassware's.

Metal Work: Metal work includes designs jewelries, pendants, medals and trophies.

Fashion: Fashion designing is the process of using drafted patterns to create or sew garments and its accessories like hats, caps, shoes, belts and bags.

Creativity, an Element of Fine and Applied Arts

Creativity is defined as the ability to solves problems, fashion products, define new questions in a domain, or in a way that is usually considered novel, but intimately become accepted in a particular cultural setting (Gardner 1993). Therefore, creativity is the ability to produce work that is both novel-original and useful. Creativity is the generation of new ideas and elimination of old ones, such as new movement in art, new social programs, new scientific findings, and new inventions in technology.

Zimmerer and Scarborough (2005) defined creativity as the ability to develop new ideas and to discover new ways of looking at problems and opportunity. Creativity is an important resource-building tool in fine and applied arts especially in this present competitive world. The Paleolithic and the Neolithic ages have passed away; we now live in the 21st century, an age of fast-paced driven technology where creativity is used as the major instrument.

Anyakoha, (2006) suggested that creativity and entrepreneurship skills can be learnt, and that there is a need for training people, students inclusive in the area.

(Gruford in Anyakoha 2006) identified fine and applied arts as an area of creativity because if an individual should exhibit a high degree of traits to invent, design, contrive, compose and plan, then there is an indication of creativity in him.

Fine and Applied Arts – A Practical and Theoretical Approach

Fine and applied Arts like some other course of studies aimed at producing self-reliance individuals. In that view, it is very necessary to emphasize the practical and theoretical approach in the teaching of fine and applied arts since the theory aspect which may give an insight to what is expected of a particular skill may not be enough to equip the child to face the real/actual thing he needs to create, that is why in Nigeria we have so many art graduates that cannot create a satisfactory jobs that can put food on their tables. In view of this, they are all on the queue for white-collar job.

Problems of Fine and Applied Arts in Polytechnic

The initial aim of fine and applied arts is to produce graduates with appropriate skills in their areas of specialization that will be able to be employed or be self-reliant. But many of them lack the expected technical skills and competencies required for being employed, self-reliant and nation building, as a result of this, the researcher has identified the following problems.

Under Funding by the Government: Under funding has been a major problem facing the teaching and learning of fine and applied arts in the polytechnics. Fine arts are vocational and technical education that requires a lot of fund for the procurement of equipment needed for students training.

Lack of Electricity: With the present epileptic power supply in the country, most polytechnics where fine arts are taught do not have constant power supply. Most of the equipments used for teaching the students are electrically powered; as such frequent power outage often obstructs the proper functioning of the equipment used in the departments.

Technological Constraints: Technology has transformed the way of doing things all over the world. This has greatly improved the effectiveness and efficiency of production. But the departments of fine and applied arts in Nigerian polytechnics lack the benefits of modern technology. With the present global trend in technology, there is need to equip the departments with modern facilities so that students will be acquainted with the modern technology on graduation. Students on leaving school lack the technical skills required to manage the machines they will meet outside.

Manpower Problems: Another problem of fine and applied arts in polytechnics are the absence of qualified technical and managerial personnel. It is an obstacle to the teaching and learning of fine arts in the polytechnics. Imagine where an engineer would be appointed to coordinate the department of fashion and clothing technology or a graphic designer/artist to coordinate the department of Engineering. The attendant consequence is that there would be lack of appropriate learning experiences and content for the achievement of predetermined objectives by the students. Olujide, (2001) stated that every country wants to invest in education because of national development. For national development to thrive, there is need for manpower.

Lack of Academic Standards: The lecturer or instructor is believed to have undergone a professional training in a polytechnic or a university and having got the specialized skills and competence required to impact the acquired knowledge to the students, are expected to teach the students the right thing.
The emphasis placed on exhibition should also be diverted to academic matters in fine and applied arts. The academic standard in fine and applied arts has greatly reduced due to the emphasis placed on studio work, as a result of this; graduate artists do not publish books in their various areas of specialization rather they concentrate on exhibition only. A lecturer or an instructor is expected to feed his students with mental food which they can digest, but without a book used as an aid for instruction on the subject matter, the students will not be able to improve on their skills. The students of Fine and Applied Arts can hardly take a course in a General Studies department (GNS), this is because they do not have a reading culture, and as a result the department is seen as a place where students engage themselves in practical works only. Finally, the researcher believes that polytechnic educational managers and curriculum planners should be technically and creatively skilled enough to transmit relevant contributions to the teaching and learning of fine and applied arts in polytechnics.

Conclusion

Fine and Applied Arts education is expected to preserve and reform society to the extent that it is a pleasant course of study for individuals. Integration of entrepreneurship education in the curriculum of fine and applied arts in Polytechnics will reduce the trend of graduate artists not being employed or self-reliant.

Recommendations

Fine and Applied Arts educators must become more competent in the use of academic technology and also expand their scope of study with new innovations in the teaching and learning of fine and applied arts in polytechnics.

There is need to integrate entrepreneurial culture in the curriculum of fine and applied arts in polytechnics. Government must make provision for assisting graduates of fine and applied arts by creating a forum for graduate assistants in order to help them set up their studios. This is because, financial and investment support is important for the socio-economic development of any individual. The government should equip the various departments of fine arts with modern facilities.

Educational planners should implement both the practical and theoretical plans of entrepreneurship that will be able to meet the cultural patterns and modern practices of fine and applied arts in polytechnics.

References

Anyakoha, A.U. (2006). *Entrepreneurship education and wealth creation strategies. (Practical tips for education empowerment and survival)*. Nsukka: Great AP Express Publisher Ltd.

Gardner, H. (1993). *Multiple intelligences*. The theory in Practice N.Y. Basic Books.

Hass, G. (1980). *Curriculum planning*. (3rd Ed) Boston: Allyn and Bacon.

Ibrahim-Bankoko, (2000). *Visual arts made easy for schools and colleges.* Lagos: Movic Publishing Company Ltd.

Momoh, s. (2007). Benefits of being self-employed. *Lagos: Business Day*, September 26, Pg 36.

National Policy on Education. 4th Ed. (2004) Yaba Lagos: NERDC Press.

Ogumor, E. (1993). *Certificate art for junior and senior secondary schools*. Ibadan: University Press
.

Olujide, A. (2001). *Educational administration*. Onitsha: Lincel Books Ltd.

Onwuka, U. (1996). C*urriculum development for Africa*. Onitsha: African – Fep. Publishers Limited.

Wasagu, M.A. (2000). Introduction to curriculum studies. In M.I. Junaid, A.A. Salani and M.G. Maitasin Ed. *Reading in Education* Vol. 1. Sokoto: Educational Foundation Unit.

Zimmerer, T.W. & Scarborough, N.M. (2005). *Management*. New Delhi: Tata. McGraw Hill Publishing Company Ltd. 11th Ed.

IMPLEMENTATION PROBLEMS OF THE UBE SCHEME IN NIGERIA

Julie Enoma – Calus

Abstract

This paper highlights the poor implementation of the Universal Basic Education (UBE) and the way out. It sees the need to ensure a purposeful funding and monitoring of the scheme by all the tiers of Nigerian government, Non-Governmental Organizations (NGOs), including every individual who is residing in the country as one arm alone cannot make it to succeed. The paper is of the view that the UBE is supposed to be recognized as a veritable tool to address issues of poverty, under development health problems, conflicts and intolerance, human rights abuse, and so no, in accordance with the provisions of UNESCO. It recommends, among others that if Nigerians can shun corruption and all its ramifications, the UBE will actually succeed for the common good.

Introduction

Nigeria is endowed with human, material and natural wealth in all sections of the economy. This is why all education programmes in the nation's economy should be able to produce skill competencies for the workforce so as to justify qualify utilization of material resources in the implementation of Universal Basic Education (UBE). Anyakoya (2003) opined that the UBE is supposed to be recognized as a veritable tool to address issues of poverty, under-development, quality population, illiteracy, ignorance, gender inequality, indiscipline, disorderliness, health problems, conflicts and intolerances, human rights abuse, etc. In accordance with the provisions of UNESCO (2005).

In this regard, the Federal Republic of Nigeria (NPE, 2004) expressed feat her education is to be seen as an instrument "par excellence" for effecting national development. Hence, Ukeje (1979) quoting O'Connor (1957), gave five aims of education as enumerated below;

(a) to provide men and women with the minim urn of skills necessary for them to take their place in the society, and to seek further knowledge;
(b) to provide men and women with vocational training that will enable them to be self-supporting;
(c) to awaken an interest in and a taste for knowledge;
(d) to make people to become critical in their thinking;
(e) to put people in touch with and train them to appreciate the cultural and moral achievements of mankind.

Additionally, when the Obasanjo Regime launched the Universal Basic Education (UBE) programme on the 30th September, 1999, an implementation programme was spelt out so as to achieve the following specific objectives:

(a) developing in the entire citizenry a strong consciousness for education and a strong commitment to its vigorous promotion;
(b) the provision of free, universal basic education for every Nigerian child of school-going age;
(c) reducing drastically the incidence of drop-out from the formal school system (through improved relevance, quality, and efficiecy);
(d) catering for the learning needs of young persons who, for one reason or another, have had to interrupt their schooling through appropriate forms of complementary approaches to the provision and promotion of basic education;
(e) ensuring the acquisition of the appropriate levels of literacy, manipulative, communicative and life skills as well as the ethical, moral and civic values needed for laying a solid foundation for life-long learning.

In this regard, Nigeria's current Universal Basic Education (UBE) is very laudable on paper, but very poor in its implementation. Currently, there are signs to show that it is not succeeding. Eraikhuemen (2000) stressed that attempts in the past to provide free education, whether at the

Federal or State level, have never succeeded. Taking a cursory look into h, especially from independence in 1960, the former Western Regional government installed a free education programme in 1955. Also, the former Eastern Region established a free education system in 1956, and both of them failed woefully.

In addition to this, Eraikhuemen (2000) asserted that hi 1976, General Olusegun Obasanjo, who was then the Military Head of State, mounted the Universal Primary Education (UPE) programme, and it did not achieve the desire goals. In the same vein, the Unity Party of Nigeria (UPN) of the former Bendel State, under the governorship of Prof. Ambrose Alli, established free education programme in 1979, which also did not succeed.

UBE in Nigeria

Nigeria is a signatory to many international covenants, and the Universal Basic Education (UBE) is one of them as evidenced by the following:

(a) Ouagadougou Conference on the Education of Girls and Women (1982)
(b) World Conference on Education for All (WCEFA), Jomtien, Thailand (1990).
(c) Delhi Declaration of E-9 Countries (1991).
(d) Sixth Conference of African Ministries of Education, Dakar (1991).
(e) The Seventh Conference on the Education of Girls and Women (1998).
(f) The O.A.U. Decade of Education in African States (1997-2000).
(g) Dakar World Forum on Education for All (April, 2000).

In this connection, Obanya (2000) and Idusogie (2006) opined that the Universal Basic Education scheme (UBE) was launched in Sokoto (Nigeria) on the 30th of September, 1999, by President Olusegun Obasanjo as one of educationally backward nations of the world; and also to actualize and give credence to it through practical implementation.

Arisi (2002:306) added that UBE is a programme intended as a visible evidence of Nigeria's strong commitment to the Jomtien Declaration of 1991 which requires stringent efforts by the E-9 countries (nine nations of the world with the largest concentration of illiterate adults) to reduce drastically illiteracy within the shortest possible time frame. It is also a commitment to the Durban Statement of 1998, and the O.A.U. In addition to this, the O.A.U. Decade of Education in Africa (1997-2006) requires African States to generalize access to quality basic education as the bedrock for sustainable and viable economic development of the continent and the world in general.

The Constitutional Backing of UBE

Obanya (2000) illustrated that the UBE is also in keeping with the requirements of the Constitution of the Federal Republic of Nigeria (1999). The educational objectives are stated in section 18, as follows:

"...Government shall direct its policy towards ensuring that there are equal and adequate educational opportunities at all levels."

"...Government shall eradicate illiteracy, and to this end, Government shall as and when practicable provide":

(a) free, compulsory and universal primary education;
(b) free secondary education;
(c) free university education; and
(d) free adult literacy programme."

Obanya (2000) also explained that basic education, according to the Jomtien Declaration and Framework of Action on Education for All, is not defined in terms of years of schooling. Neither is it limited to formal schooling. The author further asserted that it sees education in its broadest sense as of a close articulation of the formal, the non-formal and informal approaches to the awakening and all-round development of the human potential. Hence, the broad aim is to lay the foundation for life-long learning through the inculcation of appropriate learning-to-learn, self-awareness, citizenship and the life skills.

Obanya (2000) also stated that the Federal Government was to carry out a process of sequential implementation plan for a progressive nine years duration that would ensure basic and qualitative education cycles. Now, H has been replaced with nine years of primary education, three

years of secondary education and four years of university education/Taking it further, Obanya (2000) stressed that during the 9-year "gestation period", states and local governments will progressively improve the conditions of:

(a) teacher quality improvement;
(b) updating of infrastructural facilities;
(c) enhanced availability of instructional materials.

In addition to this, as UBE is "education for all", it is supposed to take care of the nation's youth up to tertiary institutions and eventually become self-reliant in their various skill in line with NYSC scheme's objectives as follows:

1. To inculcate discipline in the Nigerian youth by instilling in them a tradition of industry, hard work and of patriot and loyal service to the nation in any situation they may find themselves.
2. To raise their morale by giving them the opportunity to learn about higher ideals of national achievements, social and cultural improvements.
3. To develop in them attitudes of mind acquired through shared experience and suitable training, which will make them to be more amenable to mobilization in the national interest.
4. To develop common tiers among them and promote national unity.
5. To encourage members of the service corps to seek, at the end of their corps service, career employment all over the country, thereby, promoting tree movement of labour.
6. To induce employers, partly through their experience with members of the service corps in order to employ more readily qualified Nigerians irrespective of their states of origin.
7. To enable Nigerian youth to acquire the spirit of self-reliance.

Hindrances of Universal Bask Education in Nigeria

The hindrances to the implementation of Universal Basic Education programme in Nigeria are as follows:

(a) By Telling Lies through Issuing of Fake Receipts and Inflation of Contract Sums or Unit Prices.

Aguan (2007:58) explained that many government officials tell lies right from the beginning of implementation. The author further explained that such officials in charge of implementation plan:

(i) Criminal wastages of huge sums of money and other material resources through telling lies of varying degrees by issuing fake receipts and certificates to contractors so as to cover high costs supposedly incurred or expended on construction of roads, bridges, buildings and international stadiums including electricity power supply, pipe-borne water supply, provision of drugs to hospitals, etc.
(ii) Inflated contracts for the procurement/supply of tools, gadgets, instruments, equipment, machines, laboratories, furniture and fittings, etc, to schools, colleges of education, polytechnics and universities.
(iii) Inflated hotel bills;
(iv) Inflated kilometer or mileage coverage between work stations and official headquarters;
(v) Frequent repairs of supposedly vehicle break-downs,
(vi) Inflated cost of petrol/diesel for vehicles, and so on.

In this regard, when so much money has been siphoned out through the above decaying habits, there would be nothing left to implement any programme for the general good of citizens. This is why Saraydarian (2005) opined that when many people are involved in telling lies with a view to gaining monetary or material reward, it is a sign that such people are personality or self-centred, and their actions will never favour other people and their environments. Hence, they misuse their positions to enhance their greed.

(b) **Inadequate Educational Infrastructure:** This is one of the worst problems facing effective implementation of the UBE, Arisi (2002) stressed that inadequate
classroom spaces have resulted in over-crowing in schools. Many primary and secondary schools were built long time ago by both government and church missionaries. Hence, most of the buildings, roof-stops, desks, chairs, tables, floors, etc., have become extremely bad.

Many village schools which were built with self-help efforts have been damaged due to long neglect especially blown roof-tops, damaged floors, destroyed windows/doors, and have been occupied by reptiles, while the children take lessons under the trees or shades. Government ought to have put some efforts to renovate them so as to accommodate more pupils but this was not done. Instead, government began to build one block of three classrooms in each primary school with approved colossal sums of money, whereas, it would have been more economical and beneficial to renovate than to build new ones. Hence, only few primary and secondary schools with fewer structures would have needed new ones. This problem is still persisting till today.

(c) **Inadequate Funding of Schools:** This is a very big problem, hence, the failure to priotize the use of available funds that would cover areas of need like: employing qualified teachers, procuring textbooks, improving on existing infrastructures, procuring equipment, instruments, teaching aids, and the like.

Lack of funds has resulted in the absence of workshop in schools, in training and re-training of teachers at all levels, inadequate provision of classroom buildings and laboratories, etc. It also affected the attendant problems of shortage of libraries and of stocking them with relevant up-to-date textbooks, as well irregular payment of teachers salaries and allowances.

(d) **Teacher Utilization:** This is another major obstacle. Musa (2000) has slated that the major problem confronting teacher utilization is in their allocation and distribution to schools. This means that there are many teachers in the urban and sub-urban areas as compared to those in the rural and remote areas. In this case, there is lack of competence of teachers' utilization in both urban and rural areas. Hence, a teacher's competent utilization is achieved when there is a good combination of his or her general education, mastering of teaching subjects and personal qualities in the day-today discharge of duties.

In this regard, it is a common place to find in most of our public primary and secondary schools that even though teachers are qualified, their personal vices being displayed towards work have affected their competencies. There are numerous personal vices like: absenteeism, frequent ill-health or excuses, frequent maternity leaves, uncooperative attitudes, working at loggerheads with headmasters, headmistresses, principals and members of staff, etc., exceedingly lower the quality of competence, and as such, contribute to lowering the standard of UBE teachers,

(e) **Lack of Enriched UBE Curricula:** The UBE curricula are yet to be enriched in accordance with its goals and objectives and they ought to have been carried out in several dimensions. The areas for immediate attention are:

(i) Laying a good foundation for life-long learning;
(ii) The inculcation of appropriate levels of literacy and numeracy;
(iii) Developing good aptitude for practical work;
(iv) The acquisition of socially desirable life skills;

They are very related to the teaching and learning of vocational and technical education skills including classroom work and laboratory practice. Also, they equally apply to all forms and conditions of out-of-school learning at the time a child drops from a formal school system.

(f) **Poor Knowledge of Practical Use of Equipment and Maintenance Culture**: Presently, there is a wide-scale poor practical skills among students who have graduated from JSS level, as there is nothing to show that they have learnt the use of equipment in laboratories especially in vocational, technical and science subjects. Hence, the issue of maintenance culture has continued to elude the country.

(g) **Lack of Statistical Population Data for UBE Planning:** There is lack of population data bank in Nigeria that ought to aid UBE planning especially in the provision of more classroom spaces, laboratories, teaching aids and equipment, etc. what happens in most cases is that

population figures are usually over-politicized; hence, it has not been easy to allocate school-age population figures from the publicized population census data. It has affected the technical capacity including the logistics for data collection analysts. This is why it is difficult to plan and implement the UBE programme.

(h) Poor Monitoring and Evaluation: As a result of inflated number of pupils for the UBE by many state governors, adequate monitoring of the school since 1999, and evaluation has been faulty. This depended on the managers assigned to do so. Therefore, Nwagwu (2002) suggest that:

(i) there must be choice of appropriate performance standards and indicators;

(ii) there should be a systematic programme of supervision, inspection and data collection and utilization for periodic monitoring and evaluation of the process and progress of the compulsory education scheme.

In this regard, Nwagwu (2000) also stressed that the implication is that the administrators of the UBB should always monitor not only the nature and rate of attendance, truancy and drop-outs, but also they have to evaluate the reasons why such pupils or students behaved in a particular manner.

(i) Problems of Integration of Private Schools into the UBE Scheme: This is another problem. Nwagwu (2000) also asserted that the attendance of pupils or students in public schools is not the only way of satisfying compulsory education regulation. Private schools should be involved.

(j) Poor Electricity Power Supply: This is the most basic problem because electricity is the power that moves small-scale businesses, laboratory practical works, industries, etc. it has remained a mirage in Nigeria's political dispensations as-a result of the 'political will' to do so. Nigerian leaders are merely interested in what they are able to gather form the economy; hence, nothing works for the general good.

(k) Brain-Drain Syndrome: This is due to the poor condition attached to teaching by the attitude of the government. The reward system in cash or fringe benefit cannot be compared with other professions. This is responsible for the high rate of trained teachers who abandon teaching for more lucrative professions.

Conclusion

This paper has x-rayed the reasons encouraging the poor implementation of the UBE programme: like poor monitoring and supervision including other factors, of the various stages of the scheme. It adds that high-level corruption in low and high has been adduced the greatest cankerworm that has eaten deeply into all Nigeria's economic base. Furthermore, the paper recommends, among others that it is only the Nigeria people that can stop all forms of corruption before the country can develop. This is a sure way to make the UBE programme succeed.

The Way Out

It is not easy to implement any national programme in Nigeria like the universal basic education (UBE) scheme. It cannot succeed without nurturing some values to live by at the background of it. They are as follows:

(a) Competence and Selflessness: Selfless service is a quality exhibited by a leader by considering the general good of the people at heart and play down the dictates of his personality desires. While competence is achieved when there is a good combination of a person's education, skills, attitudes, and personal attributes in doing things. This is double-sided, that is, certification and personal attitudes, and both of them must merge to produce a good work. In this vein, when the quality of selfless service is combined with competence, the natural flow of good work achievement that would be of benefit to the general good of the people or society will emerge. Hence, President John F. Kennedy of the United States of America in 1963, advised American citizens that they should not ask for what the country

would do for them but what they would do for country.

(b) **Leadership by Example:** Leadership by example is very much lacking •& Nigeria's programme delivery system, but it is a value ingredient to be nurtured at the background of implementation of the UBE programme. This type of value of is absent especially where finance, structures and equipment are involved. In most cases, leaders think of what they would gain in money or money "s worth from the system rather than using their positive and crating thinking to increase productivity in seeing to it that the scheme succeeds as is done in advanced nations.

(c) **Monitoring:** This is an important ingredient because monitoring is a kind of "watching and recording or keeping track of events in an implementation process in order to ensure that a scheme is being implemented to specifications (Eraikhuemen, 2000). Hornby (2006) defined accountability as the state of being responsible for one's decisions or actions, and one is expected to explain them when asked. This is where many projects, programmes or schemes fail in Nigeria. All forms of corruption are the hallmark of Nigeria's backwardness. The is certainly affecting the universal basic education programme.

(d) **Sincerity of Commitment:** For any scheme to succeed, there should be sincerity of commitment and purpose to be nurtured at the background of it. Recent happenings in Nigeria's political scene reveal that politicians in power are just interested in how much money or money's worth they are able to gather or to make out of their positions rather than being interested in actual execution of programmes in accordance with work specifications. What one sees nowadays is that there are fine UBE buildings in place but the teachers' salaries including other support staff have not been adequately taken care of while contractors are hurriedly paid their entitlements. While legislators are concerned with how much money they are to make form the national cake with little or no interest in seeing to it that UBE becomes part and parcel of Nigeria's educational system. No wonder Clark (1999) and Adedoyin (2001) said that Nigeria's politicians do not encourage people-centred development but enslavement.

(e) **Good Habit of Hard Work:** This is also an important aspect of die implementation process of any programme like the UBE, Good hard work, in this respect, contributes immensely towards the development of the environment through a person's display of the right attitude to work coupled with his skill competencies and punctuality. Where there is hard work, the products achieved good longitivity, thereby, enhancing self-reliance.

References

Achugbu, P.E. (2003). *Science and technology in society*. Onitsha: West and Solomon Publishing Coy Ltd.

Adedoym, S.S. (2001). Vocational and technical education - culture of enterprise, responsibility, national development: A path to self-reliant economy in developing nations, being a lead paper presented at the 1st national conference, school of vocational and technical education, Tai Solarin College of Education, Ijebu-Ode, Held Between 11th and 15th June.

Aghenta, J.A. (1995). The financing of education in Nigeria. *Data manage schools* (ed. Ehiametalor, E.T.), Benin City: Nigerian Educational Association, 205-214.

Aguan, J.A. (2007). *Education for self-actualization*, Freetown: Downs Publications

Akpochiafo, W.P. (2003). Refocusing education in Nigeria: making more sense the out of the effort. *Refocusing Education in Nigeria* (eds.: Oriaifo, S.O., Nwaokolo P.O.E.& Igbogbor, G.C.), Benin City: Da-Sylva Influence, 38-42.

Arisi, R.O. (2002). The universal basic education: problems and prospects. *refocusing education in Nigeria* (eds.: Oriaifo, S.O., Nwaokolo, P.O.E. A Igbogbor, Benin City: Da-Sylva Influence, 306-310.

Eraikhuemen, L. (2000). The need for effective monitoring and evaluation of universal basic education (UBE) Programme for a sustainable national development. The Nigerian Academy of Education, Benin City: Academy Congress Publication. 397-407.

Fafimwa, A.B. (1991). *History of education in Nigeria*. Ibadan: NPS Educational Publishers Ltd.

Federal Government of Nigeria (2004). *National policy on education*, Yaba-Lagos: NERDC Press.

Nwagwu, C.C. Managing the challenges of the compulsory schooling aspect of the UBE Programme, (ed. Aghenta, J.A. & Awanbor, D.), The Nigerian academy of education - Proceedings of the 15th annual congress of the Nigerian academy of education held in the University of Benin City, 6-9th November, 2000, Benin City: Ambike Press Ltd., 162-171.

Obanya, P.A.I. (2000). Federal Republic of Nigeria implementation guidelines for the universal basic education (UBE) Programme" (ed. Aghendta, J.A. & Awanbor, D-X The Nigerian academy of education - proceedings" of the 15th annual congress of the Nigerian academy of education held in the University of Benin* Benin City, 6-9* November, 2000.

CHALLENGES OF APPLYING INFORMATION COMMUNICATION TECHNOLOGY (ICT) IN THE USE OF ACADEMIC LIBRARIES IN NIGERIA

Benson Dele; Anthony Uniogbokhai and Eunice N. Nwadioha

Abstract

This study looked at the application of information communication technology in academic libraries in Nigeria. The concept of ICT was examined while the challenges ICT posses on libraries and librarians were discussed. The problems and prospects the application ICT on libraries were also examined. This paper concluded with the solutions to the problems associated with the application of ICT in Nigeria academic libraries, and also recommended among other things that, government should intensity efforts to provide information communication technology (ICT) and training and re-training opportunities should be made available for librarians.

Introduction

The world is presently undergoing an information revolution, a period when developing economic of the world have accepted information as a valuable resource equitable to other natural resources such as gold, petroleum, cocoa. From time immemorial, information and how to collect, process, stores, communicate and disseminate it have attracted man's attention. Ononogho (1990) states that the technologies for recording information range from clay tablets in ancient Mesopotamia through papyrus and parchment to wax and paper. It means information and technology for collection; processing, storing and disseminating it are probably as old as man himself. Thus, when today people talk about information and communication technology (ICT) they are referring to the modern concept of the subject.

Information technology has changed the way people live and work, in teaching and learning to research, management, industry, libraries, business national economy, international affairs to mention a few. Our educational system needs a thorough re-examination and an X-ray. The education we need in this 21st Century is an education that will provide answer to the nation's problems, economically and technologically. If we continue to sleep educationally, then we may pay a very costly price. With the global explosion of knowledge, the quality of education in the nation is not catching up with the tremendous changes imposed by technological world and economic globalization. From ages, information and how to collect, process, store, communicate and disseminate it have attracted man's attention. The direct consequence of globalization and the information age in which the global community finds itself calls for conscious re-examination and redirection of libraries, like their counterparts which are faced with challenges of globalization.

Librarianship and library under the influence of the information and communication technology has witnessed transformation, while libraries services now cut across geographical boundaries with the emergence of the virtual libraries system in the redefining and extending the traditional definition of library and has rendered the definition of a library with respect to a particular institution or geographical region inappropriate. Libraries must therefore overcome the prevailing perspective of locality in libraries organization because libraries have a key role to play in providing people with the right information in the context of the global village.

Traditionally libraries are information service institutions with the advent of information and communication technology (ICT) which brought about the revolutionary journey from traditional to digital or virtual services, information providers are the facilitators of these process.

The shift from traditional libraries with site-specific collection to digital or virtual where information and knowledge sources have no geographical boundaries seems to expand the services of libraries and information professionals in various organizations.

Library collections have almost always contained a variety of materials, contemporary libraries maintain collections that include not only printed materials such as manuscripts, books, magazine, newspapers, journals, bulletins, but also art productions, films, sound and video recording,

maps, photographs, microfilms, microfiches, CD-ROMs, computer software's, online database and other media. In addition to maintaining collections within library buildings, modern libraries often feature telecommunication links that provide users with access to information at remote sites.

The modern world, library inclusive is undergoing a fundamental transformation as the industrial society of the twentieth century rapidly given way to the information society of the 21st century. This dynamic process promises a fundamental change in all aspects of our lives, including knowledge information dissemination, social interaction, business practices, political engagement, education, health leisure and entertainment etc. The central mission of a library is to collect, organize, preserve and provide access to knowledge and information. In fulfilling this mission libraries preserve a valuable record of culture that can be passed down to succeeding generations libraries are essential link in this communication between the past, present, and future. Whether the cultural record is contained in book or in electronic formats, libraries ensure that the record is preserved and made available for future use.

Concept of Information Communication Technology (ICT)

Information technology (IT) refers to all forms of technology applied to the processing, storing and transmitting information in electronic form. The physical equipment used for this purpose includes computers, communication equipment and networks; fax machines and even electronics pocket calculators. Information technology can be traced to Ancient Civilizations from when writing systems were invented and used in recording the traditions and cultures of these civilizations. Throughout these ancient civilizations, the method of recording theses knowledge and information was basically by hand, using the various writing system like the cuneiform in Mesopotamia, Hieroglyphics in Egypt and Greek and Roman Alphabets had become the norm.

The thirst for more information and knowledge, led to the invention of the pointing press by Johan Gutenberg in Dresden 1474 which revolutionaries the printing and dissemination of information and knowledge for all times. Till date printing though having undergone a lot of technological improvement still remains the major means of information dissemination all over the world. The direct impact of this was the increase in the production of written (printed) documents, which led to the blooming of learning. Consequently the invention of telegraph in the 18th century went a long way to change the manner in which information could be disseminated from place to place, this was the basis of the modern information and communication technology revolution.

Following the industrial revolution in the 19th century, which virtually most human economic production routines mechanized the next step come with the invention of the so called computer by Charles Babbage in 1834 who gave it the name Analytical engine. The prototype of the computer as we know it now however was developed by the Americans in the 1940's beginning with UNIVARC project. Then came the third and forth generations and finally the personal computer (PC), which has been at the forefront of the information revolution and what has come to be known as the new information and communication technologies.

The information society is an evolving concept that has reached different levels across the world reflecting the different stages of development. The force fuelling this rapid transformation of remote and isolated information units into global interconnected super highways is information and communication technology. Relying on advances in the development of the micro clip and the development revolution has completely re-structured the global social-economic equations and let to the transformation of the transformation of the world into a global village.

Before the emergence of the computer, telephone services were commonly used all over the world for communication purposes. The fax, telex, and many others came in by the advent of the computer and its capacity for networking, which brought about internet. The fusion has given rise to Information and Communication Technology (ICT). Hawkins (2002) notes that knowledge and information have become the most important currency for productivity, competitiveness and increase wealth and productivity.

Akintunde (2004) opined that information and communication technology emphasized the use of the computer and other technology such as telephone to process, transport and transfer voice and other data singularly or mixed with at least interference or dissertation of content. Information and communication technology is therefore a short hand for the computers, software, networks, satellites

links and related systems that allows people to access, analyze, create exchange and use data, information and knowledge which until recently were almost unimaginable.

What is Internet?

Internet is an international network. It is not a single network but a collection of computers world wide through a system of interconnection. The network consists of computers of varied size, make and number. Computers in countries and regions of the world are linked through telecommunications system. It revolves around connectivity, interactivity or communication compatibility among the subsystems of the network system. This high level of connectivity fosters unparalleled degree of communication, collaboration, resources sharing and information access (Oketunji 1999).

McBride (1997) opined that Internet is a veritable tool for global online services. Availability of the internet technology have paved the way for some associated services in respect of serials, such as browning, E-mail, online system and information management. Librarians use internet and its multimedia component, the world wide web, to answer reference queries and to provide access to materials not previously available to their patrons. In some tertiary institutions of higher learning investments in personal computers and high-speed local area network (LANS) provided the students and staff with the ability to access vast5 sources of information via the Internet. This system helps in interconnecting computers within a singly location using very high speed private telecommunication infrastructure.

The Wide Area Network (WAN) in its own case helps computers within a geographically dispersed area or city to interconnect and share information.

With the emergence of these networks, effective information transfer can be affected. It is possible to access information in other libraries outside a user's domicile, which is highly convenient, time and cost saving.

It is equally possible for library users to concurrently share the same information. With these developments, the traditional library is being phased out and replaced by a virtual, digital (electronically created or imagine) library. As a result, libraries can now extend their traditional roles of facilitating self-education and individual enrichment by providing law-cost of force computer access to online resources. What can be achieved in information generation, acquisition, collection, processing, display and dissemination, was very exciting and intoxicating, and resulted in futuristic dreams. The advances in the fields of telecommunications, computer technology, and satellite communications have revolutionized information delivery services in advanced countries.

Akpan (2001) asserted that information can be delivered across countries into houses and offices instantly. Such sharing of information has given rise to the concept of globalization.

Computerization of libraries though relatively new being a little above a decade as expressed by Naney Schiller (1992) defined it as a process in which computer and telecommunication technologies make access to a wide range of information resources possible. It is referred to as E-library "Virtual library" or "Digital library" or a "library without wall" this is so because the users are able to enjoys the enphoria of being able to access collections in distant libraries and yet he or she has not physically moved. It is an experience of virtual reality.

Computerization of library services is a child of necessity arising from the need to use technologies in accessing the world's information overload, or information explosion for human survival and development. It is mandatory for all libraries especially academic libraries to embrace it in its entirety. Information is power. And how a nation accesses and uses this power will soon become more important than how it uses its coal, oil, gas and other natural resources. The right to access information and ideas is vital for any society. If the citizens are to participate and make informed choices, they must have access to political, social, scientific and economic information and cultural expression, freedom, prosperity and development of society depend on education as well as an unrestricted access to knowledge through, culture and information. This right to intellectual freedom is essential to the creation and development of a democratic society.

Challenges of Information Communication Technology (ICT) on Librarians and Libraries

Librarians and information professionals of the future must be equipped with a wide range of

personal and transferable skills in order to manage the changing environment in which he or she works. The importance of transferable skill over information technology is highlighted here".

Management and Interpersonal Skill will make Librarians to be

(a) More effective managers of net worked resources and services.
(b) Possess expert knowledge of the content of information resources, including the ability to critically evaluate and fitter them;
(c) Provide excellent instruction and support for library and information services users;
(d) Use appropriate information technology to acquire, organize and disseminate information and
(e) Analyze the professional domain and where it is heading.

Hashim and Mokhtar (2005), asserts that the new era librarian will become the guardian of digital information and will be the vehicle to preserve democratic access to information. The digital librarian's role will be increasingly towards offering consultancy to the users in their efforts in providing digital reference services, electronic information services, navigating, search and retrieval of digital information through web document that span the universal digital library or the global digital library. The new era librarian will be an embodiment of digital information professional or digital knowledge worker who will ensure that the digital libraries are use effectively and with ease.

The libraries and librarians are ever more now required to conform to international standard in other to fit into and participate in the current global economy. This fact in itself poses great challenges before the librarian. It is obvious to the librarian that he has to undergo a mental re-orientation. His outlook, posturing and beliefs have to curve or change to accommodate the new world. The change of outlook is what positions him mentally to begin to seek out ways for training and retraining to acquire the required skills for his job. Acquiring these skills is a challenge of which he must be ready to acquire Computer literacy skills to navigate cyberspace, skills for creation and evolution of web sites, skills in information management and access, skills to maintain profession alliances and skills in simple maintenance of equipment all these skills he/she need in addition to those he already had on the job.

Problems of Information Communication Technology in Academic Libraries

(i) Fear of adverse impact on employment. It is generally believed that computer can do a lot of task of library operations thereby relieving staff of their positions, resulting to lose of jobs.
(ii) Apprehensions that the new technology could be too expensive. There is expectations that the technology both hardware and software could be expensive and unaffordable.
(iii) Lack of qualified personnel to handle the task.
(iv) Lack of support from management as a result of budget constraints i.e. lack of fund.
(v) Problem of retrospective conversion of data from manual to a digital system.
(vi) Lack of adequate power supply. There is always power outage in Nigeria; computerization of libraries required twenty-four hours power supply.
(vii) Lack of maintenance culture. Maintenance cultures is absence in our country one thing is to install something and another thing is to maintain them as most people believe that government property is no body's property.

Prospects of Information Communication Technology in Academic Libraries.

The search for information now is assuming a dimension whereby an information user is increasingly becoming conscious of an individualized approach. In this regards, he wants a personalized access to information without assistance from library and librarians. This approach can easily be made available; the use of computer can facilitate an integrated information environment (Ubogu 2000).

Saule (1990) asserts that computerization offers faster retrieval of a greater range of materials than the traditions method. The implication of this is, is that the user has the opportunity to search with the use of a more dynamic and varied search tools.

Tedd (1984) gave the benefits of computerization of libraries which encompasses all libraries as follows.

(i) To provide a better service at a lesser or no great a cost and
(ii) To give added benefit at lesser cost. Computerization of library system is of immense benefits both to the user and the library staff.
(iii) The provision of the online access (by users and staff) to a library catalogue.
(iv) The ability to access much more information through online search services than would have been to produce easily management information such as the average cost to new books, number of books on loan to specific group's e.t.c.
(v) Saving present cost and curtails the cost of future expansion.
(vi) Accurate completion of tasks.
(vii) Time saving in performance of tasks.
(viii) Increase control of library activity that are repetitive in nature.
(ix) Permit the acquisition and use of literature on CD-ROM thereby saving the even increasing cost of acquisition to important serial and other publication for higher education and research.
(x) Save shelving space for the libraries as a significant proportion of serial and reference collection can be on CD-ROM.
(xi) Reduce the incidence of mutilation, defacing of library materials. The CD-ROM for example is search resistance and can more easily be secured from diligent users than printed materials in the open shelves.
(xii) Improve the image and efficiency of the libraries and librarians both of which are important in securing the confidence and patronage of users.

Conclusion

The emergence of Information Communication Technology (ICT) and the application of computers technology to library operations have served to blend and expand information services, operations and dissemination of information.

Libraries have no other option than to join the global information economy else they will be isolated, because the world is undergoing a global information revolution in which the library cannot afford not to be an actor. The importance of information lies in its value as a resource and in its strategic value in decision making and planning. The ability to harness information from all facets of the economy will add value to decision making and information dissemination to users.

Recommendations

(i) Government should intensity efforts to provide the infrastructural facilities for information. Communication technology (ICT). Attention should be geared by the authorities for proper funding of libraries.
(ii) Proper training and re-training opportunities should be made available for librarians.
(iii) Priority should be given to storage of multi-volume materials in machine readable format
(iv) Federal Government should address the problems of power more pragmatically.
(v) Sub-departments of ICT should be established in schools.
(vi) All imported ICT equipment should be tax-force or subsidized.
(vii) Networks and resources sharing should be undertaken by academic libraries.
(viii) Staff and students of the various institutions should be re-orientated on maintenance culture of ICT equipments.
(ix) Nigeria academic institution should be ICT compliance in order to survive the rather competition information world.

References

Akintunde, F. (2004) Positioning vocational and technical education in alleviating poverty, proceedings of NATT 14th Annual conference held at Umunze.

Akpan, B. B. (2001) Framework of educational practice in Nigeria Durand Publishers and Information Science Education (NALISE) University of Ibadan 4th – 7th August.

Atkinson, J. Et---al (2000). *Treasures construction and Use: A practical manual* 4th ed. London: ASLIB.

Daniels, H. (2002) *Management India*: Academic Press.

Ebijuwa, A. S. (2005) Information and communication technology in University libraries. The Nigeria experience. Doughert & Richard, M. (1995). Balancing technology with professional value. American Libraries 26 (7).

Fluckiger, F. (1995) Understand networks multimedia applications technology Hendeli Hempstead: Prentice Hall 217. Hawkins J. D. and catalano R. F, (2006) Broadening the vision of education: School of health promoting environments. *Journal of School of Health* 60 (4) 178.

Ifidon S. E. (2003) Information superlughway access to research resources in Nigerian state Universities, Social and Management Science Review ITC 120.

Jimba, Samuel, W. (1999). Information technology and underdevelopment in the third world library review 48 (2), 79.

Mcbridge, P. K. (1997) Internet for windows 95 made simple 2nd ed. Oxford: Butterworth. Heinemann.

Oketunji, I. 1999 Application of information technologies in Nigerian libraries: problems and prospects paper presented at the 10th Biennial Conference of the National Association of Libraries.

Ononogbo, R. U. (1990). Information and technology for its communication. Enugu: ABIC Books and equipments.

Saule, M. R. (1990) Teaching for library technology: Practical guide UK: MacDonald

Ugboma, M. U. (2005). The law librarian and globalization: Prospects challenges in communicate: *Journal of library and information science* vol. (7) 1 and 2.

Tedd, L. (1984) An introduction to computer based library system 2nd ed. Chichester; John Wiley.