Abstract

Quality education is the main instrument for economic development. The vision 20:2020 goal for education is to establish a modern and vibrant education system that will ensure the maximum development of the potentials of individuals for effective participation in the workplace, through the provision of access to quality education at all levels through an improved teaching and learning process. The main focus of this paper is to elucidate on the use of new Information and Communication Technologies (ICTs) innovative strategies to enhance the quality of vocational agricultural education delivery at all levels of schooling in Nigeria for economic development. The paper highlighted the importance of Agricultural education to national economic growth and defined the concepts and benefits of New ICTs in the teaching and learning process. It gave an account of the development, organization and delivery of agricultural education in Nigeria; discussed how new ICT tools/ facilities can be used for vocational agricultural education delivery as well as stated the implications of NICTs innovative delivery strategy for economic development. Some major barriers to the use of New ICTS for teaching and learning in Nigeria schools were outlined and include: lack of ICT competence/ inadequate training of teachers; non-availability of computers/other infrastructure; inadequate funding and inadequate power supply. The paper concluded that NICTs innovative strategies need to be integrated into vocational agricultural education delivery to ensure quality agricultural education to meet the agricultural skills needs of the economy. Consequently, ways of ensuring
Agriculture has occupied the front burner in the economic development of Nigeria. Agricultural production accounted for over 60% of the Gross Domestic Products (GDP) of Nigeria in 1960. But, it declined to 34% in 2003 (Central Bank of Nigeria (CBN), 2003). Nigeria’s economy is presently hanging on the edge of a precipice as evidenced by the large army of unemployed youths, increasing poverty and the pervading threats of food and social insecurity due to the utter neglect of agriculture (Egbule, 2012; Tibi, 2012). The inability of the education system to improve students’ understanding and appreciation of agriculture (Tibi, 2012), is being blamed for the utter neglect of the agricultural sector. Generally, there are complaints that schools and institutions in Nigeria are not meeting the educational needs of the society and that teachers are not doing enough to help the young ones understand the complex and ever dynamic world through appropriate teaching (Ekpiwre, 2007). Vocational Agricultural Education (VAE) is not an exception. VAE in Nigeria has been criticized for its poor practice, poor delivery strategies and skills gap (Aluede, 2011). Tibi (2012), pointed out that the brand of VAE being offered to the students are unproductive and lack entrepreneurial content. Tibi (2012), also stated that VAE is being taught like a science subject for the purpose of passing examinations without any vocational intent and it’s recipients end up with cognitive development rather than occupational skills (Alfred & Okojie, 2009).

Evidence from developed nations has shown that agricultural skills development by the youths is a desiderata to drive national economies (Egbule, 2012). Therefore, agricultural education is very vital to the agricultural development of Nigeria since the nations that have achieved agricultural feats in the world such as USA, Israel; Britain, China; Australia etc., relied on the instrumentality of education (Ihebereme & Maduwewesi, 2007). The vision 20: 2020 goal for education is “to establish a modern and vibrant education system that ensures the maximum development of the potentials of individuals” (Obioma, 2011:3). This goal could be achieved by providing access to quality education at all levels through an improved teaching and learning process and the provision of relevant and adequate teaching and learning infrastructure (Obioma, 2011). Quality education focuses on learning which strengthens the capacities of children to act progressively on their own through the acquisition of relevant knowledge, useful skills and appropriate attitudes (Adams, 1993). The school systems all over the world is challenged to provide quality education which will prepare the youths for effective participation in the 21st century workplace (United Nations Educational, Scientific and Cultural Organizations (UNESCO), 2010).
The Information and Communication Technologies (ICTs) in education policy document by UNESCO (2008), envisages an approach for leveraging technology to facilitate quality improvement and transformation in education delivery. A key focus in the policy document is on the use of ICTs to transform the roles of the teacher and learner in the classroom which has engendered a paradigm shift in the teaching and learning process from an emphasis on the traditional pedagogical methods of teacher-centred, content and lecture-based instruction to more innovative technology-based constructivist methods such as competency-based, problem based, project-based, student-centred interactive learning (Oliver, 2002). The education systems globally are under a great pressure to adopt these innovative methodologies and integrate ICTs into the classroom instructional process (Kainth & Kaur, 2010). Many advanced countries including Australia, South Korea and Singapore have integrated and advanced in the use of ICTs in their educational systems (Oviawe & Ojo, 2009). Though Nigeria recognizes the pivotal role of ICTs in the revitalization and development of the country’s education system as evidenced by many ICT-driven programmes and initiatives (Ifinedo, 2007; Oyelekan, 2008), the process of teaching and learning in Nigeria schools today, is still characterized by the old conservative approach of teachers acting as repertoire of knowledge and students the dormant recipients.

Against this backdrop, the concern of this paper is to elucidate on the use of new information and communication technologies (ICTs) innovative strategy to enhance the quality of vocational agricultural education delivery at all levels of education in Nigeria for economic development. This is predicated on the premise that the use of ICTs in teaching and learning is a means of adding value to the quality of instruction in schools and this could be a panacea to some of the problems facing the provision of and availability of quality vocational agricultural education in Nigeria.

The Development, Organization and Delivery of Vocational Agricultural Education (VAE) in Nigeria

VAE was a major component of the African traditional education system and the pivot of the pre-colonial societies in Nigeria. When the European missionaries came to Nigeria, they met established traditional systems of farming and methods of transferring farming skills from one generation to the next (Tibi, 2012). However, the missionaries trained some Nigerians as gardeners and horticulturists who were used to produce vegetables, tend flowers and beautify their residential quarters.

The first known formal education in agriculture in Nigeria was the establishment of Schools of Agriculture in Moor plantation, Ibadan in 1914; Samaru-Zaria in 1927 and Umudike-Umuahia in 1955. These institutions were put in place in order to impart agricultural skills on young Nigerians for the production of crops such as oil palm, cocoa, groundnut, cotton, rubber, timber, hides and skins which were
demanded by the Agro-based industries in Europe (Osinem, 2008; Tibi, 2012). Agricultural education was introduced into the elementary school system as Nature study and Gardening, Rural Science in the few rural training centres in 1963 and later, as Agricultural Science in the secondary school curriculum in 1967 (Tibi, 2012).

Today, agriculture is being studied in Nigeria at the primary, junior and senior secondary and the tertiary levels of schooling. According to Tibi (2012), the vocational intention of these formal education in agriculture depending on the level, is the acquisition of agricultural skills, high competencies and the urge to be productive in agriculture. Unfortunately, the formal education in agriculture being provided in Nigeria is unproductive and lacks vocational intent as was earlier mentioned. Olowookere (2004) observed that vocational agricultural education (VAE) delivery in Nigerian schools is often localized to classroom instruction only rather than the required classroom work, laboratory investigation and field practical. Emphasis is on information dissemination or rote learning instead of discovery learning, problem-solving, project and competency-based learning (Ikeoji & Kayoma, 2011). This is responsible for the poor quality of vocational agricultural education which has resulted to the production of VAE graduates who cannot fit into the workplace and are unable to perform to expected capacity as a result of skills gap between the demands of employment and the level of their educational preparation (Robinson & Garton, 2008).

Osinem (2008), decried the unfortunate incidence whereby, only the cognitive domain (acquisition of knowledge) is being emphasized while the psychomotor and affective domains (workplace skills and attitude) are being relegated to the background. According to the Institute for Information Technologies in Education (IITE) (2003), effective human performance in Technical, Vocational Education and Training (TVET) consists of an interactive effect of skills, knowledge and attitude. The three behavioural domains which must be equally involved for VAE to be functional, effective and qualitative, can be developed and acquired through the use of appropriate forms of ICTs (Jung, 2005). In the present age of technological advancement, what the teacher tells the students is no more sufficient for effective teaching and learning. Learners learn better and quicker through active participation and interaction with teaching resources (Phipps, Osborne, Dyer & Ball, 2008). Therefore, for the quality of VAE delivery to be improved, ICT must be employed (ALaba & Lawunmi, 2008).

The Importance of ICTs in the Teaching and Learning Process

ICTs can be defined as electronic devices used for computing, processing, storing and communicating information (Heek, 1999 cited in Okoh & Uko-Avimoh, 2008). ICTS can be classified into two categories: the traditional or old ICTs (namely radio and television) and the new or contemporary ICTs (namely the computer, internet and telecommunications). ICTs are very essential for contemporary educational
development of any nation (Yusuf, 2007). Their role in education is becoming more and more important with the world moving rapidly into digital media and information (Oliver, 2002).

The benefits of ICTs in the teaching and learning process is quite evident in literature. Oviawe and Ojo (2009), stated that the use of ICTs in teaching enables the learner to develop knowledge, attitude, problem-solving and manipulative skills. Yusuf (2007), posited that ICTs can increase students’ collaboration on projects; increase the preparation of students for most careers and vocations; provide opportunities for students constructed learning and improved confidence. Research findings (Alaba & Lawunmi, 2008), have shown that audio visual media contribute immensely to learner’s understanding; improve learner’s performance; encourage learners’ participation in the teaching and learning process and allow for increased individualization of learning. In addition, ICTs have been found to assist in reducing teachers workloads, assist in teachers’ development and increase their pedagogical repertoire which in turn impact on their quality (Yusuf, 2007).

New ICT Tools/facilities Used for VAE Delivery

New ICTs are multimedia for instructional delivery (Yusuf, 2007). There is a wide range of new ICT options – from video conferencing, through multimedia delivery to websites which can be used to meet the challenges that VAE teachers face in today’s classroom (Jung, 2005; Kainth & Kaur, 2010). The variety of new ICTs can be used to facilitate the delivery of instruction as well as the learning process (Kainth & Kaur, 2010).

Video technologies such as video camera; video cassette recorder (VCR) and video discs are very effective media in the teaching and learning of vocational agriculture (Osinem, 2008). The discs could be used for guided and independent learning of skills in Poultry, Rabbit, Pigs and Crops Production, as well as in land/soil management practices (Ikeoji & Kayoma, 2011; Osinem, 2008).

Computer and internet access create opportunities for students and teachers of agriculture to access, store, organize and disseminate agricultural information in ways and methods hitherto unknown. The internet is very important in the teaching and learning of vocational agriculture as it goes a long way to update both the teachers and students’ knowledge by providing the needed information on-line them in agricultural fields. With appropriate software, the computer has been found to be a very useful and indispensable tool for agricultural education delivery. Ikeoji and Kayoma (2011), emphasized that ICT could boost the method of teaching agriculture by showing farm activities recorded in compact discs and VCR to students through the monitor or visual display unit (VDU) of the computer.
Educational technologies such as Digital video demonstrations and interactive laboratory exercises allow students to learn-by-doing (Phipps et al, 2008). Learning-by-doing and Guided discovery are the recommended VAE delivery methods by the Federal Ministry of Education (FME) (1985). The VAE instructional content can be achieved in textual, audio, visual and audio-visual forms thereby, ensuring equity for all categories of learners.

The Use of New ICTs Innovative Methodologies for VAE Delivery and its Implications for Economic Development

Human capital and not natural resources determine the wealth of nations. According to Mustapha and Greenan (2002), the economic competitiveness of a country depends on the skills of its workforce and the skills and competencies of the workforce depend on the quality of the country’s education and training systems. Therefore, for the recipients of VAE to be able to contribute significantly to economic growth and development, VAE must be of high quality and should be able to meet the agricultural skills demand need of the economy. School systems are expected to prepare and supply future agricultural workers with appropriate knowledge and skills to enhance their agricultural productivity and thereby promote economic growth (Labaree, 1997). A range of ICT options can be used to meet this challenge (Kainth & Kaur, 2010).

The use of new ICTs as educational technology has introduced an innovations in classroom teaching and learning processes which have engendered a new knowledge economy. The new ICTs was described by IITE (2003):12) as “the driver of the new knowledge economy”. Supporting the assertion, Obioma (2011:3-4), surmised that:

Knowledge is fast becoming a strategic asset for economic development. Advances in information and communication technology are occurring on a tremendous scale. For countries tapping into the new ideas, innovations and technologies that proliferate in a knowledge-driven economy, there is a definite abundance of wealth and opportunities for its entire people.

ICTs help students and their teachers to learn to navigate large amounts of information, master new knowledge and acquire skills and attitudes that would enable them to function in the new world economy.

Barriers to the Adoption and Use of New ICTs for VAE Delivery in Nigeria

Some of the factors constraining the adoption and use of new ICTs as an innovative strategy for VAE delivery in Nigeria schools include:

1. **Inadequate funding**: Inadequate funding is a major problem to the Nigeria education sector. Low financial resources have stalled some notable ICT enabled
initiatives (Ifinedo, 2007). The unavailability of some ICT facilities in schools due to under-funding has hampered teachers’ use of ICTs.

2. **Non-availability of computers/other infrastructure**: The cost of computers and the procurement of internet access in Nigeria is too high (Ifinedo, 2007), as a result of which there are no computers and internet facilities in over 90 percent of public schools in Nigeria. The computer equipment in the few fortunate schools that have, tended to be under-used and they lacked appropriate education content (Oyelekan, 2008). Also, there are no ICT mediated learning materials for VAE delivery in Nigeria.

3. **Lack of ICT competence/inadequate training of teachers**: The inadequate training of VAE teachers on the use of ICT in classroom instructional processes has been identified as the main barrier to the use of ICT for instructional delivery. The training efforts of teachers both at personal and institutional levels have focused mainly on digital literacy with little or no pedagogical content. This is inadequate for teachers to apply in the classroom instructional process.

4. **Teachers’ resistance to change**: The teachers’ resistance to change from traditional pedagogical methods to more innovative technological based teaching and learning methods is another major problem facing such initiative in Nigeria. Teachers’ resistance arises from their perceptions; personal and psychological factors; resistance to organizational change, time management problems and lack of support from the administration (Mumtaz, 2000).

5. **Inadequate Power supply**: Another major infrastructural challenge in Nigeria, is inadequate power generation. Electric power failure has been a persistent problem militating against ICT application and use in Nigeria as teachers cannot use computer or access the internet in order to impact skills and knowledge on the students without electric current (Ifinedo, 2007).

**Conclusion**

Quality education is the main instrument for the economic development of a nation. The strength, security and economic development of a nation rests squarely on the quality of education provided for its citizens.

Therefore, there is the need to adopt and integrate new ICTs innovative methodologies into vocational agricultural education delivery process to ensure quality agricultural education to meet the agricultural skills needs of Nigeria economy.
Recommendations

The following strategies could help to mitigate the barriers highlighted above and ensure adequate use of new ICTs for effective agricultural education delivery in Nigeria:

1. Adequate funds need to be provided to schools by the various tiers of government and donor agencies in order for them to procure and equip with the ICT infrastructural facilities needed for teaching and learning;

2. Schools at the various levels of education should be well equipped with computers, internet access and other necessary ICT infrastructural facilities. Teachers and students should be given access to these facilities for teaching and learning purposes;

3. There is the need for VAE teachers to have ICT pedagogical competence. The teachers should be adequately trained on how to apply the new ICT innovative methodologies for instructional delivery through seminars, symposia, workshops or in-service education;

4. Efforts should be made by the concerned government organs or agencies to ensure the development of ICT –mediated learning materials especially software specific to the teaching and learning of Agricultural Science.

5. The Federal government of Nigeria needs to redouble effort in her current drive at transforming the power sector in order to ensure the generation of adequate power and its distribution to the nook and cranny of the country so that all schools can be electrified.

References


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