THE EXTENT OF TECHNOLOGY AND VOCATIONAL EDUCATION (TVE) INNOVATIONS IN NIGERIA

Reagan N. Robinson
Department of Technical Education
Rivers State University of Education, Rumuolumeni
P.M.B. 5047, Port Harcourt.
Rivers State, Nigeria

Anthony I. Amadi
Department of Technical Education
Rivers State University of Education, Rumuolumeni
P.M.B. 5047, Port Harcourt.
Rivers State, Nigeria

ABSTRACT

This study was on the extent of technology and vocational education (TVE) innovations in Nigeria. A brief introduction that encompasses the focus of TVE, its problem and the need for innovation was given. A concept on TVE innovations was also given. Five areas of TVE innovations in the past ten years were pointed out which cut across both rural and urban sectors of the Nigerian economy. Barriers to TVE innovations were briefly expatiated. The study concluded by giving some recommendations like, government should create a better political leadership in terms of creating an appropriate and supportive climate for TVE innovative system and adjustment of the public management paradigm to allow room for risk-taking without being penalized for possible failure. Implication for further study on TVE innovations was also further stated.

INTRODUCTION

Technology and vocational education (TVE) has been an integral part of national development strategies in many societies because of its impact on productivity and economic development. Despite its contributions in the world, this aspect of education has not been given the attention it deserves in Nigeria. And that is one of the reasons for the nation’s developmental challenges (Robinson, 2006).
Technology and vocational education “is a planned program of courses and learning experiences that begins with exploration of career options, supports basic academic and life skills, and enables achievement of high academic standards, leadership, preparation for self-reliance, industry-defined work, and advanced and continuing education.” And vocational education and training “prepares learners for careers that are based on manual or practical activities, traditionally non-academic and totally related to a specific trade, occupation or vocation.” In other words, it is an “education designed to develop occupational skills.” TVE gives individuals the skills to “live, learn and work as a productive citizen in a global society.”

The provision of technology and vocational schools has a long history. Before the Industrial Revolution (between 1750 and 1830) the home and the “apprenticeship system” were the principal sources of TVE. But societies were later forced by the decline of handwork and specialization of occupational functions to develop institutions of technology and vocational education (Duffy, 1967). Manual training that involves general instruction in the use of hand tools was said to have developed initially in Scandinavia. However, technology and vocational education became popular in the post primary schools in Nigeria during the 1970’s and developed into courses in industrial training, bookkeeping, and allied commercial work in both public and private institutions. Later in the 80’s TVE training grew into higher institutions of learning, awarding degree certificates, hence enhancing its goal.

Meanwhile, there is an ongoing struggle to position TVE and raise its status in Nigeria (Robinson, 2006). Currently TVE training sits as a bridge between secondary and higher education. The challenge is how to increase the attractiveness of TVE to students, parents and employers so that TVE is seen as a valid educational pathway in its own right. This is the rationale behind this study, seeking to find the extent of TVE innovations and strategies in the last decade. Most of the TVE program delivered through the school system in the previous decades had been in lower certificate levels. Currently, the government is trying to raise perceptions of TVE to meet growing skills demands in Nigeria through National Board for Technical Education (NBTE), and also promote TVE qualifications at higher levels. Greater integration of TVE and the industry is seen to give students improved flexibility to move between sectors and gain the qualifications they are seeking. Building an integrated relationship between TVE and the industry is another intention of this study.

The Nigerian TVE system is under internal pressure to undergo systemic change to better respond to the ongoing structural changes in the labor market and the wider economy by providing sustainable technical skills. To solve this problem, the extent of last decade innovation should be known. This is what this study is trying to bring out. The study will seek to find out how TVE had imparted and created something new in the development of Nigeria.

The realization of TVE innovation in Nigeria is not a simple one, since there was no road map to its establishment in the nation. However, a critical look shows numerous TVE innovations in Nigeria, but there is room for advancement, and it is necessary to act without delay. The nation must move ahead now, in a spirit of exploration and experimentation and with the broadest possible range of partners, so as to contribute through education and training to a sustainable future of TVE. Taking incremental steps now is preferable to waiting for larger measures to be realized. Such steps are of equal importance in both developed and developing nations, and some steps are common to all nations.

THE CONCEPT OF INNOVATION

According to Paulston (1976) innovation is a relatively isolated technical or programmatic alterations or as low level change. Fundamentally, innovation has to do with changes leading to improvement in the quality and quantity of products as well as techniques of doing things. In vocational and technology education (TVE), innovation is any kind of dynamic change that will add
value to technology and vocational education processes and outcomes. Innovation is dynamic and creates new things out of existing ones.

Through innovation, the scientist and technologist had introduced new production techniques, new commodities, improve on existing ones, open up new markets, explore new source of raw materials and design new techniques of manufacturing. Research and Development Programs are formal avenues of introducing or inculcating innovative skills in the entrepreneur. These skills are what the entrepreneur translates into business establishment and development. TVE schools everywhere are being noticed to be preparing young people for the jobs of tomorrow considering the important role they are playing in the innovation process. The innovation has enhanced the multidisciplinary nature of TVE and opened up its supposedly close links to the world of work and educational sectors. It has also contributed to the training of community skilled labor and gave both young people and adults the knowledge required to ply a trade.

For many, it is a passport to employment and the possibility of social advancement. The innovation in TVE is therefore considered essential because a country cannot achieve economic and social development without a skilled, productive labor force that can meet the changing requirements of its environment. However, the innovations in TVE systems are everywhere facing challenges to prepare a sufficient number of people with the right skills to meet labor market demands. Matching skills, knowledge and attitudes to the needs of innovation is increasingly challenging in the current context of globalization and rapid technological change due to the constant transformation of policies.

A critical issue for TVE planners and managers in Nigeria is how to train individuals for future jobs on the basis of innovation covering past and present labor markets (Adamu, 1994). This national dilemma is aggravated more in the northern regions due to the permanence of adverse economic, social and educational conditions. Yet, the perceived supply-driven feature of most TVE systems made the innovations even more pronounced, as compared to other regions. The main criticisms of TVE now has the gradual but slow public sector provision, legacy of the manpower planning approach, often associated with low quality, high relative cost and poor external efficiency. In the early 1990s, this severe diagnosis and the number one priority given to basic education led to reduced external support to the sector and to the implementation of major reforms to make TVE systems responsive to labor market-needs, including those of the informal economy. This agenda was precisely outlined in the 1991 World Bank sector policy paper on vocational and technical education and training. However, the little innovations experienced so far are proving the fact that there is hope for TVE.

On the other hand, during the President Olusegun Obasanjo regime, the federal government of Nigeria built on a national skills framework and quality criteria central to mobility of skills across sectors and regions, and it allows for diversity in strategic priorities and implementation thus creating a potential space in which TVE innovation could flourish. However, in spite of the framework, innovations in the north have so far remained highly localized. This is the case both because of the dynamics of decision-making in a federal system, and also possibly because of limited mechanisms in place to learn from promising practices across regions.

Nigeria’s experience of TVE innovation is evident on the on-going incremental change in the TVE system at both federal and state level. This has been driven by the skills agenda linked to the challenges of a developing economy and a drive to make TVE provision much more attractive.

**TVE INNOVATIONS IN THE LAST DECADE IN NIGERIA**

Moving towards the goal of TVE, there had been fundamental changes in human attitudes and behavior in our personal lives, in our community activities, and in the nation at large. These changes had been dependent on the level of initiative and innovations (OECD, 2009). This different
extent of innovations has gradually given TVE a better face lift in the educational sector and society. The followings are some of them.

1. **Introduction of TVE Skills in Rural Women Development**

   Education, skills development and technical training are central to agricultural and rural employment. They prepare mostly young people for work in the formal and informal sector in rural areas and thus play an important role in poverty reduction. The better the training and the more refined the skills are in terms of human capital, the higher the income and returns and the better the rural livelihoods. TVE has created an impact here; rural farmers can now make use of improvised equipment.

   In many projects the targeting of “youth” is based on the common misconception that boys and girls are a homogeneous group. Too often, the gender neutral use of the word “youth” implies that program do not cater for the different needs of young women and reach mostly young men, who are more visible in public. Early marriage and child bearing further limit the possibilities of rural young women who are severely restricted in their mobility and restrained to the domestic sphere in many societies.

   Public and private providers of education and training poorly serve rural you the specially in when comparing opportunities available to urban youth. The extent of ‘urbanbias’ in the provision of publicly funded education and training services is large in most low income developing countries (Bennell 2007). The deployment of teachers and other educational staff or trainers to rural areas is difficult in many countries. Several factors contribute to dampen the demand for education among poor parents including the poor quality of teaching, high direct and indirect schooling costs and the paucity of ‘good jobs’. Education has also a lower level of priority compared to other short term pressing needs such as maximizing household income or providing food security. About 130 million young people in developing countries (15-24 years) are classified as ‘illiterate’ with women representing 59per cent (UNESCO 2008). The high number of illiterate youth and those with low schooling are mostly living in rural areas and are poorly prepared for productive work (Atchoarena and Gasperini, 2003).

   TVE under National Association of Teachers of Technology (NATT) tried its effort to give our rural women farming skills, particular under the innovation mainstreaming initiative in 2005 to promote innovations that have a positive impact on rural poverty. NATT also succeeded in its program of Technical Advisory Division on Innovative forms of training and Capacity-building aimed at improving the training components in government supported projects. Training is one of the primary means to build the capacity of poor people to participate and benefit from mainstream economic development. In the last decade, NBTE under the program Plan of Action (POA) targeted rural women on capacity-building and training which are fundamental to the success of other development interventions, from skill acquisition to rural finance and gender equality.

   An important part of TVE resources in Nigeria go to capacity-building and training activities, up to 30 per cent in some projects. These brought about a variety of innovations in TVE training activities. Our women in rural communities are now applying TVE trainings to their day to day living especially in farming (Fluitman 2005).

2. **Entrepreneurship of TVE Skills**

   Entrepreneurship activities brought about business and production innovation with resultant growth in enterprises and industrial organizations (Robinson, 2006). From history, entrepreneurship development in Nigeria is a late starter as the indigenous entrepreneurs were never allowed to develop by the colonial entrepreneurs. The promulgation of the Nigerian Enterprise Promotion Decree of 1972 provides stimulus for entrepreneurship development via small and medium scale enterprises promotion. Private businesses sprung and grow generating employment, income and
increase in GDP. Before now, Nigerian entrepreneurs have not ventured into the less-explored areas like technology and vocational education (TVE). However, in the last decade, TVE has supported entrepreneurial ingenuity through various programs to encourage self-employment, income empowerment, technical progress and economic development. Entrepreneurship through TVE development still remains the strong policy option for developing Nigeria’s manufacturing and industrial sectors (Robinson, 2006). With increase in TVE support, exploration of new areas of competitive and natural advantage by entrepreneurs, among others, Nigeria will stand a better chance of increasing her pace of economic development.

According to Schumpeter (1995), entrepreneurship is a process of change where innovation is the most vital function of the entrepreneur. It is the basic requirement for economic development in a free enterprise or mixed economy where innovation is the basis of development. Innovation in a system can increase the marginal productivity of the factors of production, which TVE began experiencing in the late 2007. The skills people acquired through TVE enabled them to become self-employed and hence entrepreneurs. For instance, Radio and TV technicians, Auto mechanics, carpentry etc. This is a typical innovation of TVE processes.

Since a lot people are now entrepreneurs through TVE enhanced innovations, it is becoming a recognized field of study that has a stake in development of the Nigerian economy. According to Schumpeter (2001) capital and output growth in the economy depends significantly on the entrepreneurship of TVE skills. This quality of performance of the entrepreneur has proved the fact that TVE innovations would grow the nation’s economy through self-employment.

3. TVE Integration into Nomadic Education Program

The establishment of the Nigerian National Commission for Nomadic Education in 1989 created wider opportunities for an estimated 9.3 million nomads living in Nigeria to acquire literacy skills. This commission was struck to address low literacy rates among pastoral nomads and migrant fishermen, which put literacy rates at 0.28 percent and 20 percent respectively. To improve the literacy rate among Nigeria’s nomadic populations, the National Commission for Nomadic Education employed various approaches such as onsite schools, ‘shift system’ schools with alternative intake, and Islamic schools, to provide literacy education to its nomads. A critical appraisal of these approaches by the commission, however, shows that very few of the schools were actually viable. But of recent, the introduction of TVE skills and trainings has created series of interesting innovations.

Nigeria’s nomadic people are typically described in terms of what they do not have. They do not have access to adequate food, clean water, health care, clothes, or shelter. They do not possess basic literacy skills. Their children do not have access to basic education. Young female nomads do not have the cultural freedom to marry who they want to marry. Nigeria’s nomads, therefore, arguably need a better understanding of their socio-cultural predicament, which many consider as less developed until the arrival of TVE skills.

‘Literacy by Radio’ is an educational program that has been implemented throughout the country. Indeed, radio currently provides instructions and relays messages to Nigeria’s nomads, who are typically on the move while grazing their cattle. The provisions of tele-centres that provide Nigeria’s rural and nomadic peoples with practical skills acquisition are TVE innovations that are currently being used to teach topics in nomadic education. This learning is part of TVE innovation that is gradually enhancing nomadic life. Similarly, in recent years, there has been a steady growth in Nigeria’s mobile telephone infrastructure and a concomitant acquisition and hence, use of mobile telephones amongst Nigerians. Increasing rates of accessibility throughout Nigeria is encouraging more and more people to have access to, or purchase, a mobile phone. The nomadic education is not left out of this innovation; they are now not only taught how to use the phones, they are gradually
taught how to maintain minor faults in their mobile phones. This is another innovation of TVE in Nigeria.

4. TVE Enhancing Sustainable Development

Enhancing Sustainable Development (SD) through technical and vocational education and training (TVE) is a subject that has been on the agenda of the UNESCO TVE Program for over a decade. The Second International Congress on TVE held in Seoul, South Korea in 1999 drew attention to the need to do so by recommending that TVE be re-oriented to sustainable development. Five years later, an international experts meeting held in Bonn, Germany in 2004 highlighted this subject.

The Bonn Declaration that was issued at the close of the meeting captured the continuing importance of re-orienting TVE to sustainable development. This can be seen in references in several paragraphs to phrases and clauses such as ‘sustainable societies’, ‘sustainable industries’, ‘TVE initiatives that alleviate poverty and ‘TVE initiatives…pivotal to human-centered sustainable development’ (UNESCO, 2002). Going further than the Second International Congress, the International Experts Meeting produced concrete suggestions for action planning, comprising the following: advocacy and vision building; support for the review and development of national TVE policies; guidelines for planning and implementation; capacity building and training program; learning support materials and resources and equipment; networking and partnerships in TVE; and ongoing monitoring, evaluation and research (UNESCO, 2002). On this premise, Nigeria as a nation began a TVE oriented sustainable development through the oil companies in the year 2006. With this program, host communities of oil companies are now armed with TVE skills to enhance their lives. This is another form of innovations in TVE.

The Declaration of the UN Decade for Sustainable Development quickened the pace towards addressing practical concerns relating to integrating sustainable development in TVE. Evidence of this can be gleaned from the report of the actions and activities that were undertaken in various parts of the world, including Nigeria and Southern Africa (UNESCO, 2009). Therefore, learning resources and exemplar materials such as tools for curricular development, innovation and assessment, case studies, best practices and success stories became necessary for TVE practitioners, especially practical skill leaders and planners looking for what works as they grapple with questions of integrating SD and TVE. To move towards satisfying the need, a number of activities, including case studies in Nigeria, were undertaken.

They were carried out by writers connected with the UNEVOC Network as part of capacity building and of contributing to knowledge building and sharing. They have described and have analyzed experiences, practices relating to integrating SD in TVE program, primarily. Also, they have identified gaps for additional action so that the integration can be satisfactorily done. Through the case studies it is intended to build a pool of resources and tools of what works as part of the UNESCO-UNEVOC International Centre’s clearinghouse.

With respect to the fact that the terms sustainable development and TVE have become almost household names, following several international conferences and regional actions, related studies revealed that there is good understanding of the concept of sustainable development among most of the TVE educators who have been the focus of the studies. Hence, gradually the communities are getting armed with TVE skills to enhance their lives, environment and cultural concerns. The method is by utilizing the earth’s resources, local materials and improvisations to enhance development without jeopardizing future generations. These are part of TVE innovative strides.

5. TVE Changes Through ICT

Nigeria, like any other knowledge economy, depends on the development of its educational sector especially TVE. Higher education drives the competitiveness and employment generation in
Nigeria. However, research findings have shown that the overall state of higher education is dismal in the country. There is a severe constraint on the availability of skilled labor (Robinson, 2009). There exist socio-economic, cultural, time and geographical barriers for people who wish to pursue higher education (Bhattacharya and Sharma, 2007).

Education is the driving force of economic and social development in any country (Cholin, 2005). Considering this, it is necessary to find ways to make education of good quality, accessible and affordable to all, using the latest technology available. The last two decades have witnessed a revolution caused by the rapid development of Information and Communication Technology (ICT). ICT has changed the dynamics of various industries as well as influenced the way people interact and work in the society (UNESCO, 2002). TVE is not an exception. Since the past ten years, TVE has been experiencing some form of innovations in both classroom and workshop skills. Today some TVE workshops now have remote controlled machines. This is one of the most outstanding innovations of TVE in the last decade.

Internet usage in TVE institutions has grown exponentially (McGorry, 2002). ICT has reduced the barriers that were causing the problems of low rate of TVE enrolment in Nigeria. It has been used as a tool to overcome the issues of cost, less number of teachers, and poor quality of TVE education as well as to overcome time and distance barriers (McGorry, 2002). Nigeria has over a hundred million populations and a high proportion of the young that wants to go to a formal education system. The demand for education in developing countries like Nigeria has skyrocketed as education is still regarded as an important bridge of social, economic and political mobility. This was one of the reasons that aroused the innovative system of TVE through ICT. Today TVE is enjoying a whole lot of innovation created by ITC.

BARRIERS TO TVE INNOVATIONS IN NIGERIA

At this stage there seem to be multiple barriers to systemic innovation, some tied to the ideology of competition, while some are embedded within the system design itself, and some linked to the particular traditions for implementing reform agendas. There are several factors hindering longer term commitment of TVE to innovation. It includes;

- The difficulty of risk taking in a compliance and audit culture framework.
- The timing of policy making cycles and the complicated governance balance of the three tiers of government and the heterogeneous language and beliefs of the nation.
- The symbolic role of rapid decision-making for political purposes and resulting danger of innovation fatigue (that is, a perception of ever-changing initiatives with little follow through). This fatigue can be experienced by all stakeholders, both within and outside the political process, and it particularly harmful to innovative initiatives.

CONCLUSIONS

The extent of TVE innovations in the last decade has been tremendous. It has cut across both the rural and urban settlements, created possibilities of TVE where there is little or none. This has showed that TVE has a lot to offer and hence can be the pivot to developmental stride in Nigerian economy.

The concept of TVE innovation is not a simple one, since there was no open backup it received from government. Nonetheless, it requires an attention for advancement, which Nigeria must move ahead now, in a spirit of exploration and experimentation and with the broadest possible range of partners, so as to contribute enormously to a sustainable future of TVE. Taking incremental innovative steps now is preferable to waiting for larger measures to be realized. Such steps are of
equal importance in both developed and developing nations. Nigeria being a developing nation has experienced some changes in some sector, proving the fact that TVE extent of innovation was enormous.

RECOMMENDATIONS

Based on the extent of TVE innovations realized and the pending challenges, the following recommendations were made;

• It is recommended that the experiences and voices of other economic sectors invested in innovation (e.g. health, science and technology, industry, etc.) be integrated into the reshaping of TVE and its commitment to innovation.

• Government should create a better political leadership in terms of creating an appropriate and supportive climate for TVE innovative system.

• Given the window of opportunities presented by the three tiers of government, it was argued that the time is right to demonstrate this leadership by presenting a consensus and collaborative model of financing TVE innovations.

• Adjustment of the public management paradigm to allow room for risk-taking without being penalized for possible failure. This includes innovation of program and services, processes, and outputs.

• There should be quality and development of the training workforce, as there seem to have been few systemic attempts to tackle the specific challenges of the education and training of vocational teachers and trainers.

IMPLICATION FOR FURTHER STUDIES IN TVE INNOVATION

There is a growing body of knowledge which has demonstrated that innovation happens at different levels and that employee (skilled worker) and user-driven innovation have an essential role to play in innovation processes. These reflections – especially pertinent for entrepreneurship, could guide policies to redirect and revitalize systemic innovation in TVE.

The Nigerian reform agenda is also likely to benefit from exposure to the ways that other countries are tackling similar challenges, not least looking to countries with strong youth education and training and workforce development systems. From international literature on firm innovation, there is ample evidence that responsiveness to market needs from the education and training sector may in fact exclude those companies where the needs for strengthening their base is the biggest. In companies where competition strategies are built on cost-cutting and automation and where work functions are rather routinized, human resource strategies are most often ad-hoc and looked on as a cost-factor.

In those companies, attitudes to training are unlikely to change unless accompanied by long-term and integrated outreach strategies addressing the business as such and not only the training climate. From the USA there are many examples of how the community college has played a long-term proactive extension role by developing the workforce for potential new growth sectors. Because this type of investment does not yield immediate return, public funding has been applied in the context of wider economic development.
REFERENCES


