
THE CONTEXT OF TECHNICAL VOCATIONAL TEACHER EDUCATION IN THE 21ST CENTURY

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Abstract

Rapid changes are taking place in the work environment due to the impact of information technology. Consequently; the concept of skill which is the main aim of TVE demand new understanding of teaching and learning, especially with respect to learner outcomes. If the focus of TVE is developing skills than an integration of vocational pedagogy in pre teacher training becomes imperative. The purpose of this paper therefore is to emphasis the need for the integration of vocational pedagogy in Technical/ Vocational teacher education program. The paper recommended that (1) the federal government of Nigeria should establish a center for formulating best practices in Technical/ Vocational education (2) the Federal Government should develop a national standard for Technical? Vocational Education program (3) TVE teacher education program should be designed in a manner that supports effective vocational pedagogy and (4) that assessment should emphasize creativity and social skills.

Introduction

At the center of every educational Endeavour is the teacher. Teachers play that important role of passing knowledge from generation to generation. Every society therefore strives to develop and enhance the quality of its teacher training as means of sustaining knowledge by investing in its pre-service teacher education. One aspect of learning that demands special attention in its teacher's education is Technical/Vocational Education (TVE). Technical/Vocational Education is the comprehensive term referring to those aspect of the educational process involving in addition to general education, the study of technologies and related sciences and the acquisition of special skills, attitudes, understanding and knowledge occupation. (FGN,2004). Because teachers are very vital in the learning process, appropriate attention must be paid to teacher training because their important role and relevance in the world of work in the 21st

century. Technical/Vocational Education teacher training in Nigeria is anchored on the objectives of the National Policy on education (NPE) and the National Master Plan for Technical Education (NMPVTE, 2002).

Context of Technical/ Vocational Education Teacher

Technical Vocational Education Teacher has its roots in the need to teach skills in a formal setting. This came about against short coming of the apprenticeship method and the demand for skilled workers during industrial revolution (Humphries C. 2002). Thus, the presentation of instruction recognizes that manual skills are best taught in a structural process and in a controlled environment under the guidance of the teacher. Successful completion of training is ensured through an assessment that leads to certification, thus ensuring some form of standardization. According to Humphries, prior to the 20th century, there was no statutory

requirement to teach skills: hence the relevant vocational experiences were sufficient qualification to teach.

The aim of TVE training is the preparation of the teachers with adequate knowledge and skills for the purpose of guiding and directing the learning activities in a specified trade subject. Teachers must therefore be equipped in specialized skills and pedagogy, which is the act and craft of teaching (Smith, 2012). Current development in sciences and developments in science technology and especially in Information and Communication Technology (ICT), and the need for TVE students to be equipped, for the modern world of work, a requires a new approach on the method of preparing TVET.

21ST Century Skill and Technical /Vocation Education

The driving force behind the current change in the work place is the fundamental changes in the economy manufacturing and business. This in turn has reshaped the environment driven by information, knowledge, creativity and innovation. Consequently, all point to the fact that TVE should focus on different form of skills than the one currently taught and a compelling reason to change the way TVET are trained. Today, teachers are working with student whose lives have been saturated with computing devices. Most students are actively engaged in form of communication or the other. Kay (2010) has however noted that student access computer devices for entertainment purposes only. Therefore, if properly channeled, it appears that the communication media could be important tools in TVE. Specifically, Rosefsky&Opter (2010) provided some skills needed by TVE students to succeed in the 21st century. These are:

- Collaboration:- The ability to work in teams
- Critical communication:- Taking on complex in teams

- Oral communication:- Presenting skills
 - Written communication:- writing skills
 - Technology:- Ability to use technology
- Similarly, Saaveda & Opter provided three key skills for 21st century vocational training, which are:

- Higher order thinking skill
- Deeper learning outcomes and
- Complex thinking communication

This implies that non routine complex thinking and communication skills will be in great demand and must be reflected in TVET preparation. In addition to changes in technology and the world of work, the nature of the learner has also changed. Today learners are exposed to ICT than their teachers. The challenge facing TVE is lack of how to adapt to new method of teaching with learner who is quite different from their generation. Specifically, there is the need to understand more precisely how best to engage young learners in such ways that could be beneficial to them. The answer to improving learning outcomes in TVE come therefore be in understanding that technology and the learner have changed and to apply new teaching methods that can elicit motivation towards learning.

Historical Development of Technical /Vocational teacher Education In Nigeria.

Technical /Vocational Teacher Education in Nigeria started with the establishment of a Department of Vocational Teacher Education at the University of Nigeria Nsukka in 1961(Olaitan, 1992). This was followed with the establishment of National Technical Teacher College (NTTC) in Lagos. The program was collaborative agreement between UNESCO/ILO and the Federal Government of Nigeria in providing pedagogical knowledge to vocational teachers who were drawn from the industries for teaching as an in-service program. The objective of this program was to balance professional experience with

pedagogy. This was a one year training leading to the award of the Technical Teacher Certificate (TTC). The National Certificate in Education (NCE) Technical was introduced to this college to address teacher shortage in vocational subjects at secondary level. More NTTC's were established in the Gombe, in 1976 and Potiskum, BichiAsaba, Amoku and Umunze in the 1980 to provide teachers for vocational components of 6334 system of education. Other technical teacher programs were established in Nigerian University as major step towards technical teacher sufficiency. Today, vocational teacher qualification can be obtained at Bed, Med and PhD levels. Quality assurance and supervisory role are handed by the National Commission for Colleges of Education NCCE and the National University Commission (NUC).

Challenges of Technical /Vocational Teacher Education in Nigeria Today

All statistics indicate gross insufficiency at all levels of TVE education in Nigeria. Indeed the National Master plan for Technical / Vocational Education indicates shortfall of 78% technical teachers in Nigeria servicing 137 technical colleges across the country (NMPTVE, 2000). Teacher insufficiency without doubt is responsible for poor performance of students National Technical Examination such as WEAC and NABEB in technical subjects. Closely aligned with this is that most available teacher training programs are primarily oriented towards teaching in secondary school, hence there is no specific program for teachers in technical colleges. Coupled with teacher insufficiency and perhaps of greater concern is the poor quality of TVE teachers as noted by the National Master Plan for technical /Vocational in its report (NMPTVE, 2000). The report emphatically states that the poor quality of TVE teachers is responsible for poor quality of TVE graduates.

A technical teacher should be a first rate practitioner of his subject. Thus, technical content knowledge must be a prerequisite for teaching technology. Effective instruction in TVE should be done by those with professional knowledge and command of the skills required. In addition to technical content knowledge, pedagogy is equally a desired quality. There is indication that technical teacher education programs tend to give preference to pedagogy rather than provide a balance the two, (Nworgu, 2007) summarized the problem of TVE teacher as:

1. Poor planning
2. Lack of political will
3. Obsolete curriculum
4. Low student enrolment
5. Poor quality of teacher
6. Poor motivation of student/ teachers
7. Poor image of the teaching profession

These problems constitute a serious barrier to achieve an effective attainment of manpower development. These demands are additional input to the content in the training curriculum to address the problems of TVE teachers.

How to Prepare 21st Century Technical Vocational Education Teachers

Adopting change for preparing TVE teachers to teach 21st century skills is cooperatives as educational standards and objective of education are changing so much the methods of instruction. Research and practitioners agree that building an educational system that focuses on 21st century skills require strong human capital base (Lynch, &Horozz, 2012). The authors asserted that teacher cannot teach 21st century skills if they themselves have not mastered their skills. Technical /Vocational teacher training programs can therefore bridge this gap of teaching 21st century skills when their training focuses on new techniques of teaching skills. Essentially professional development of TVE teachers will depend on

the process that have been identified as necessary instruments in helping students adapt to the demand of this century.

As it stands most learning activities for pre-service teachers in TVE are based on the old curriculum and devoid of the new strategies. LU, Spener&Clackson (2012) provided a guide for professional development of TVE teacher.

There are:

- Routine expertise: making of every procedure in the domain
- Resourcefulness: Having the knowledge and aptitude to think effectively when require.
- Functional literacy: adequate mastery of literacy and digital illiberally.
- Craftsmanship: an aptitude to provide thoroughness towards the job.
- Business Like: Understanding the economic and social side of work
- Wider skills for growth: Having an inquisition and resilient attitude towards constant improvement.

21st Century Curriculum

Twenty first century society operate on certain attributes, therefore, the curriculum must also change in line with the new society. Invariably, there is a need for a 21st century curriculum. A 21st curriculum according to Partnership for 21st Century Skills (2012) should be interdisciplinary, project based, and research driven. This may sometimes require students to collaborate with people around in various projects. The curriculum for 21st century incorporate higher order of thinking skills, use of technology and multimedia complex thinking, valid methods of assessment etc (Saaveda& opter,2012). The implication for this is that we must train teachers who would add value to learning through the application of non-routine complex thinking and communication skills. Here, the curriculum and instruction are designed to challenge students through problem-solving and project –based

activities. Hence assessment moves from recognition of memorized facts to demonstration of understanding through application in a variety of context (Chappel & Johnson, 2003). Technical Vocational Education training must therefore align with the demand of the 21st century curriculum towards preparing those to teach 21st century skills.

Vocational Pedagogy

It is universally accepted that TVE holds the key to economic and social development by empowering citizens and alleviating poverty. However there is no standard acceptable method of industrial delivery in TVE (Lucas 2014). Different countries have attempted to address learner outcomes through increase training of TVE workforce and investment in infrastructure and equipment with varied results. Therefore, if the goal of TVE in Nigeria is to be achieved, a vocational pedagogy must consider the changing nature of the world of work teacher training programs. There is a now greater emphasis on behavioral skills than technical skills which once directed the focus of vocational pedagogy (Chappel&Johnson 2003). It is therefore important to emphasize behavioral skills in the training of pre-service TVE teachers to match current- work place demand. This requires teacher training for TVE to adopt a pedagogical model that promotes attributes such as teamwork and problem solving.

The Role of Technical/Vocational Education Teachers in Vocational Pedagogy

As earlier stated, there is considerably variation in the way learning outcomes are formulated and structured in curricula because learner outcomes are influence by factors such as teachers' beliefs experiences have a way that they practice their teaching. Towards a more effective learning outcome, many studies have suggested a learner –centered approach in TVE (UNESCO-UNEVOC, 2014; Lucan, et al

2012). The learner centered teaching method include active learning, in which students solve problems, answer questions, formulate question of their own, discuss, brainstorm during class (Mykra, 2015). It also includes cooperative learning where students work in teams on problems and project under conditions that assure positive independence and individual accountability. Learner centered teaching is anchored on inductive learning in which student in essence of vocational pedagogy (Lucan, Spencer & Clackson, 2012). First presented with challenges and learn to address the challenges. Towards addressing the issue of vocational pedagogy. The work Mclaughlin & Darlington, (2012) provide a useful guide for TVE teacher where they suggested the following:

Make teaching Relevant:

Here, teacher needs to select generic topics so that knowledge could be applied to solve problem within the environment. This would mean applying knowledge of basic principles of another setting should the selection of topics.

Teach through Disciple

This entails learning not only knowledge of disciple but the skills association with production of knowledge within the disciple. In effect, knowledge should develop knowledge. Simultaneously develop learner and higher thinking skills. This is concerned with the ability to transfer the understanding of a known variable (lower order) to a new uncharted context (Higher order thinking)

Encourage transfer of learning

Here students must apply the stalls and knowledge gained in one discipline to another. The ability to apply what students learn in school in their environment is as existence of transfer of learning (Zakka G.A, Dennis K., & Yohanna D.M

Understanding that teamwork is an outcome of promoting learning

Ability to collaborate with others is an important quality of 21st century skills. Students

learn better with their peers, therefore teachers must design instruction to promote group learning

Assessing 21st Century Skills

It is universally accepted that skills is hard to teach and 21st century skills are is even harder to teach (Saaveda & Opter 2012). For instance, it is different to measure certain qualities like creativity and teamwork that can yield valid and reliable measures.

Brinkley, Erstad, Harman, Ripley (2010). Have offered frameworks for organizing 21st century skills. This framework includes four classes of skills.

Ways of thinking which encompasses creativity and innovation, critical thinking, problem solving and decision making.

Ways of making, which includes communication and collaboration or teamwork. Tools for working which addresses information literacy and ICT literacy

Living in the world, which includes citizenship, life and career skills, and personal and social responsibility

Education has long highlighted the importance of critical thinking skills which in itself has demonstrated to predict important educational and employment outcomes (Rai & Viering 2012). Similarly, motivation is also known to predict achievement and IQ. (Broussard and Garrison 2004). Collaboration too has a powerful effect on student learner and it could even persist on subsequent related tasks (Saner, et al 1994). Thus engaging in collaboration learning opportunities with co-student can have a lasting impact on individual student learning. Based on the study by Rai & Vierving on 21st century assessment, the authors recommended that:

- Assessment system should provide multiple be of measures that support triangulation off inferences

- Assessment task should be of sufficient complexity and / or offer sufficient challenge
- Assessment should include open – ended tasks
- Assessment should include use task that establish meaningful and /or authentic real, world problem contexts.
- Assessment Task should strive to make student reasoning and thinking visible.
- The task for TVE teacher education is to adopt this recommendation into their training program to provide valid and reliable measures of student’s ability for 21st century work environment.

Conclusion

The 21st century has created massive changes in the world of work. These changes have impacted virtually all aspect of human life and especially the way society trains its future workforce which is the main purpose of TVE. Because teachers are the bedrock of any educational system, the training of pre-service teacher for TVE must adapt to the requirements of these changes in order to meet the need of the learner and society as a whole. This may require the need to develop a d integrate vocational pedagogy in the training curriculum for TVE teachers.

Recommendation

1. Vocational pedagogy should be integrated into TVE teacher training policy.
2. Curricula have to be designed in manner to support effective vocational pedagogy.
3. Federal government should establish a network for formulating best practices in vocational pedagogy. *Zakki G.A, Dennis K., & Yohanna D.M*
4. Federal government should set up a national body responsible for standard in TVE teachers
5. Assessment in TVE must adopt methods that aid creativity and social skills

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