

ITVET TEACHER EDUCATION FOR THE 21ST CENTURY

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Introduction

Technical and Vocational Education and Training (TVET) is a broad concept derived out of the traditional terminologies describing education and training leading to employment in various occupations requiring the application of knowledge and skills in performance in the work place. These included: technical education in the United Kingdom, vocational education and training in the USA, industrial arts and technology education.

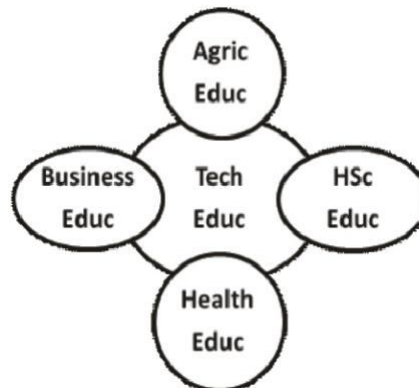
In 1989, it was resolved at the Second International TVET Congress, sponsored by UNESCO and hosted by South Korea, that the term Technical and Vocational Education and Training (TVET) already adopted by UNESCO and ILO in 1984 be universally adopted and used by the UNESCO Member states world-wide.

TVET was, thus, defined as follows:

Technical and Vocational Education and Training is a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life (UNESCO, 1989.1).

The TVET Cluster

The traditional TVET Cluster comprises of five disciplines of study, namely; Agricultural Education, Business Studies Education, Health Education, Home Science Education and Technology Education.



The foundations and critical pillars underpinning TVET as a field of study have over the years been articulated, discussed in educational forums and adopted within given diverse socio-cultural, economic and political settings around the globe. In traditional Africa, the demarcation between general education and training was not as visible and defined as in the Western civilizations. Education and training was one package imparted at home. It was all encompassing and all members of the family and community took responsibility for the conduct and up-bringing of the youth.



The fundamental philosophical underpinning of TVET is that its mandate is to prepare each individual for the world of work in which their individual talents sharpened by education and training will contribute to the wellbeing of society. The TVET's contribution is pivotal in the application and use of knowledge, skills, materials, tools, equipment, and competencies in the production of goods and services to meet human needs and wants.

Our World Today

The world in which we live today is characterized by tremendous scientific and technological explorations, innovations and explosions. It is the world of the *world wide web*, Internet surfing, face-books, twitters, YouTube, blogs, supersonic jets, virtual learning, CAD/CAM, the robotics, Nano-technologies, biotechnologies and mechatronics. It is a *global village* bound together with an array of Information and Communications Technology (ICT) networks unimagined hardly two decades ago.

However, these developments are closely accompanied by humanity's dreaded enemies proclaimed by Africa's political liberators namely; ignorance, poverty and disease. Challenges emanating from these forces have contributed to the growing conflict and dissatisfaction with the quality of life leading to wanton destruction of life and environment particularly in the developing countries of Africa.

Today, there are global trends that transcend national boundaries and societies in our *Global Village* that critically impact on education and training. Some of the trends include: demographic and economic trends, the emergence of a *Knowledge Society*, green economy, emerging technologies, the digital Era, Sustainable Development and a Transient Workforce.

The Green Revolution

We are living and experiencing a new industrial revolution popularly known as Green Revolution based on alternative sources of energy and innovative ways of production, preservation and conservation.

The trail blazers in this revolution include; the European Union which targets to cut the EU's greenhouse gas emissions by 20% in 2020 compared with 1990 level. The USA which targets significant reductions in greenhouse emissions to include cuts in emissions up to 25% by 2020 and cuts up to 80% by 2050. China plans to more than triple its wind power generation capacity becoming the world's largest wind power producer by 2020.

The above changes have already impacted on the current Knowledge Society. It has caused tremendous paradigm shifts in which economic change has shifted from Manufacturing Economy (based on low material value) to Service Economy (based on knowledge value).

It has, similarly shifted technological change from Low Technology (that is manual intensive) to High Technology (that is cognitive intensive). The McKinsey Global Report (2012) indicated that technology and globalization have reshaped economies around the world unleashing sweeping changes in markets and economies. This paradigm shift has lots of implications for the demand for higher skilled college graduate labour force as opposed to lower skilled high school graduates ultimately impacting on teaching and learning today. The Green revolution brings a new set of green jobs and skills that will need retooling of the current labour force to be engaged (Maclean, Jagannathan and Panth,2018).



The Digital Revolution

The McKinsey Global Institute report further revealed that more than 375 million workers will have to completely change their skills sets by 2030. Reason: the rate at which newer technologies such as Digitization, AI (Artificial Intelligence) and Automation is disrupting the world of work as employees have to catch up with such advances.

What is Africa's Position in these Changing Times?

As the world community strides into the twenty first century, the greater part of Africa lingers at the door step faced with a dilemma and a millennium challenge. The dilemma is that she is very much endowed with natural resources and a youthful population yet most of her children go to bed hungry. The long dreaded enemies identified by Africa's political emancipators: poverty, ignorance and disease are still very much in close encounters with her populations.

The millennium challenge is that Africa cannot afford to fall behind. She must be a significant member of the 21st century to survive. To do so, she must:

- Enter, survive and remain competitive in a world that is fast becoming a global village.
- Embrace and nurture the culture of scientific and technological literacy.
- Have a workforce with the necessary knowledge and capacity to propel Africa into the 21st Century and sustain it.

Africa's Vision

The African Union's vision for Africa 'is to have an integrated, peaceful, prosperous Africa, driven by its own people to take its rightful place in the global community and the knowledge economy (AU, 2008)'.

The Vision 2020 represents Nigeria's Economic Transformation Blueprint and long term development agenda aimed at repositioning Nigeria to become among the top twenty largest economies in the world by the year 2020 (Nigeria, 2011).

Kenya's *Vision 2030* is the country's new development blueprint covering the period 2008 to 2030. It aims to transform Kenya into a newly industrialising, "middle-income country providing a high quality life to all its citizens by the year 2030" (Kenya, Government of, 2007 p.1)

The TVET Mandate

The challenge to produce a modern workforce capable of responding to the current rapid changes and unforeseen future challenges therefore, rests on the shoulders of teachers (specifically TVET teachers) to impart critical knowledge, skills and capabilities to meet the current and future needs and wants of Africa's growing and globalising populations.

AU Strategy for TVET in Africa

The AU emphasizes the guiding principles of; Access, Equity, Proficiency and Relevance. It articulates the main goal as the promotion of skills acquisition through competence based training with proficiency testing for employment, sustainable livelihoods and responsible citizenship (AU,2008).

The AU seeks to position TVET as a tool for empowering the peoples of Africa especially the youth for sustainable livelihoods and socio-economic development of the Continent.

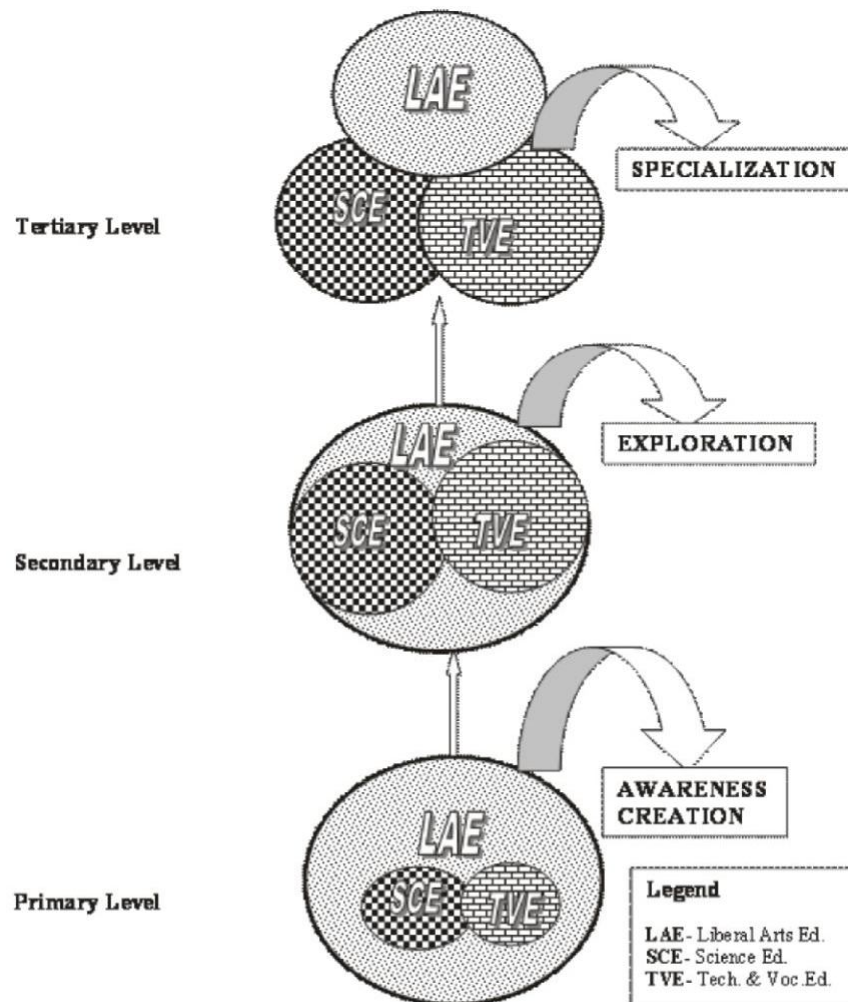
TVET at Basic Education Level

Whilst most TVET subjects can be introduced at basic education level, the study of technology is most appropriate as it contains the essential practical elements of vocational education (Kerre,2006).

Emphasis at this level should be placed on awareness creation and exploration introduced in progression from early learning to high School level.

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Fig.1 An Integrated School Curriculum for the 21st Century.

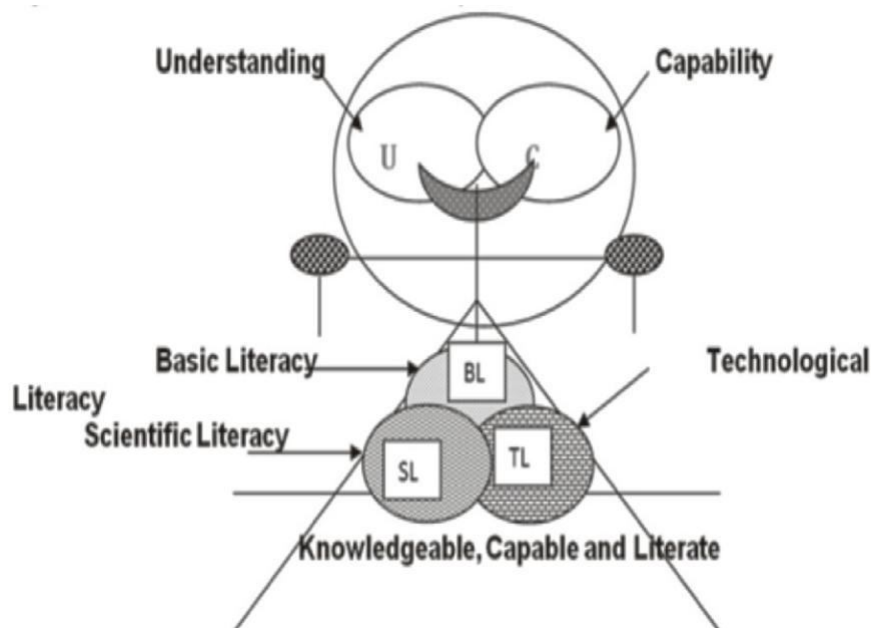


Technical and Vocational Education and Training at Tertiary Levels

While the central focus of TVET at this level is to prepare individuals for job or occupational entry, the demand for new knowledge and skills dictates that opportunities for higher education and training be made available. The concept of lifelong learning is now more relevant than ever before.

There is need for a balanced school curriculum that offers TVET as an integral aspect of general education (Kerre, 2017)

Fig2: A Balanced Curriculum for the 21st Century



A balanced curriculum will lay more emphasis on understanding and capability in which case full literacy in the arts, science and technology will be achieved.

TVET and Skills Improvement for Higher Productivity

Technological and industrial advancement requires the broad availability of high-quality secondary education and vocational training.

The ability to innovate and adopt more complex and sophisticated technologies requires TVET at the tertiary level, and particularly with skills in research and development” (ILO, 2008 Report V).

The Need for Higher Order Thinking (HOT) Skills

There is wide recognition of an emergence of Higher Order Thinking (HOT) skills embedded in Benjamin Bloom's taxonomy of educational objectives developed over fifty years ago.

HOT involves the learning of complex judgemental skills such as critical thinking and problem solving, Creative thinking, Information handling, Communication skills, Technology application skills, Teamwork skills, Autonomous learning skills, Entrepreneurship skills and Cross-cultural understanding skills.



Future generation TVET teachers have to move from being Transmitter of knowledge to Facilitator of knowledge. They have to desist from being Controllers of learning to Creators of a conducive learning environment. They should not be Always experts but be Co-learners and collaborators. They should move from Single media application and embrace Multimedia application. Most importantly, they should move from expository learning to experiential learning.

In tandem with the above strategies, 21st Century Learning should embrace some of the following features; be Learner-centered, Media-driven (this doesn't have to mean digital media), Personalized, Transfer-by-Design, Visibly Relevant, Data-Rich, Adaptable, Interdependent and Diverse.

It is important to note that the modern teaching and learning environment has benefitted immensely from technology. The integration of ICT in teaching and learning now makes it possible to reach more learners and to address their learning needs at personal levels.

Some of the modern Teaching Strategies include being adoptive. This involves embracing the new tools that have emerged over the years such as SMART BOARDS (Chalk Boards), TABLETS (Text-Books), etc. The teacher must be able to assess the needs of learners and adopt different modes of learning and new technologies.

The Need for a Paradigm Shift in Teacher Education

The traditional role where learning was teacher centred is no longer suitable in modern learning environments. The teacher is at best a facilitator enhancing experiential learning through multimedia practices. In order to transform the TVET Practice, the current practices which are archaic, passive, teacher centred and textbook driven must be abandoned to shift to new paradigms which emphasize critical thinking, flexibility, communication, creativity, technology and innovation.

Despite the dizzying changes that are characteristic of modern global economies, it is worthwhile reflecting on the purpose of such education. The aim of such education is to equip us with knowledge, skills and attitudes that will empower us to order a quality life that is sustainable. We all treasure a life that is peaceful, environment friendly and with much lower poverty Levels in our communities, higher literacy rates and healthy lifestyles.

TVET is all about our capability and capacities to produce the goods and services we need to satisfy our needs and wants. Our curriculum should be derived from the above demands.

The Millennium Challenge for TVET Teacher Education

Besides grappling with the challenge of producing TVET graduates for the green economy and society, an even more pertinent question for our purposes in this discussion arises: *What new knowledge and skills are required of the current and future TVET educators/trainers to be able to produce the above TVET graduates for the green economy and society?*

The ultimate challenge for TVET teacher education is:

“to produce teachers who can cope with the challenges of the Knowledge Society, the ever moving target of technology, the ICT Era and Sustainable Development”.

Essentially, we have to prepare students for jobs that do not yet exist, be ready to use technologies that have not been invented and solve problems that we may not even know that they are problems yet. This, seemingly, is daunting task in a confusing state.



TVET teachers will need higher level knowledge and competencies in the same disciplines required of their graduates and must have wide experiences and skills in the application of various teaching/pedagogical tools.

A New Curriculum for TVET Educators

What knowledge, skills and capabilities must TVET educators have to be ready to prepare a productive workforce for the new globalised economy?

Technological literacy, critical thinking, creativity and mastery of core subject matter are the lifeblood of the modern workforce. Besides, our TVET graduates must have:

- The disposition and capacity to be lifelong learners,
- The capacity to adopt to rapidly changing reality,
- Problem-solving skills,
- Practical skills and
- Awareness of global issues.

A modern TVET teacher should also be a lifelong learner. This entails embracing new technologies, methodologies, and approaches to learning.

They should also advocate for the profession. The teacher must be able to discuss trends and developments in the discipline and share with the community and students.

In Conclusion

It is worthwhile to remember the words of Albert Einstein that “*We cannot solve our problems with the same thinking we used when we created them.*”

The same is echoed by John Dewey who says “*If we teach today's students as we taught yesterday's, we rob them of their tomorrow.*”

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