

The role of Technical and Vocational Education and Training (TVET) in Human Resources Development: The case of Tumba College of Technology (TCT)-Rwanda.

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Abstract:

Despite Rwanda great geographic, cultural and demographic diversity, it shares many challenges and issues that are fundamental to improving the quality and relevance of TVET as a means of human resources development. Rwanda must consider a coherent strategy for human development in which TVET plays an important role. Among the critical issues that must be considered when planning TVET programs to develop Rwanda human resources are the following: Population growth and urbanization; poverty and lack of income-generating capacity; increase demands for literacy and secondary and technical education; and pollution and environmental degradation.

The success of TVET in any developing country can be considered a key indicator of the country's advancement in development. Any country that evolved into a technological advanced one, TVET must have played an active and vital role as skilled manpower would have been required, also to enable its sustainability.

The choice of this paper title was done having carefully considered the following factors:

- African Union decision at ordinary session held at Khartoum, Sudan 23-24 January 2006 which contain the plan of action for 2006-2015. Most conspicuous in the decision, member states were called upon to accelerate and expand provision of quality education for sustainable development.
- Emphasis contained in the opening speech by the Hon. Minister of state for Education at the joint workshop between technical schools and industrial sector Rwanda on September 18, 2007.
- Rwanda targets on vision 2020 and Economic Development and Poverty Reduction Strategies (EDPRS).

However, this paper shall underpin the major attributes of TVET using TCT as reference institution which shall serve as a catalyst to human resources development throughout provided the following steps are taken:

- Flexible and industry led curriculum that integrates innovations, vocational and general education and that is delivered through a multidimensional approach
- Incorporate new education/training technologies into TVET programs
- Increase international and regional cooperation to strengthen TVET
- Increase funding of activities relevant to the promotion of TVET

1. Introduction:

Technical and vocational education and training (TVET) refers to education and training that prepares persons for gainful employment (Finch and Crunkilton 1999). In other words, TVET refers to deliberate interventions to bring about learning which would make people more productive (or simply adequately productive) in designated areas of economic activity (e.g., economic sectors, occupations, specific work tasks). TVET has the potential to enhance human capabilities and enlarge peoples' choices. The benefits of TVET need to be more equitably distributed between men and women, and between rural and urban areas.

The beginning of TVET is difficult to trace as it connotes skills and competencies which has been embedded in surplus of other histories. The perception of the origin of TVET by many is in diverse ways. However, general education and training began in pre-history with the transmission of knowledge and culture from one generation to the next. The use of tools, beginning with those made from stones, evolved as humans evolved. In the pre-historic *hunting and gathering* society, skills were passed from parent to child as members of small, usually related, migratory groups. The transition from this stage to the settled cultivation of crops marks the beginnings of civilization—and with it recorded history. The education and training that occurred is best embodied in the **Chinese proverb: 'Give a man a fish and he will eat for a day. Teach him how to fish and he will eat for a lifetime.'**

The World Bank, International Labour Organization (ILO), United Nations Educational, Scientific and Cultural Organization (UNESCO), and other organizations have recently shown drive towards actively recognizing anew the role of TVET. However, UNESCO who is at the forefront of TVET promotion, had the following objectives established at the Seoul Congress (UNESCO, 1999):

- To provide TVET for all;
- To orient TVET for sustainable development;
- To strengthen TVET as an integral component of lifelong learning.

One of the key goals of the Education for All (EFA) Framework for Action adopted in Dakar, Senegal, in 2000 (UNESCO, 2000) stipulates that the learning needs of all youth and adults should be met through access to appropriate learning and life-skills programmes. Since this is basically what TVET does, the linkage between the two thrusts already exists, but must be strengthened and broadened in the future.

TVET can take place either in formal schools (i.e. kindergarten through to grade 12 or 13), or increasingly in post-secondary community and/or technical colleges, or informally by means of training at the workplace and increasingly by distance media. TVET prepares learners for specific jobs or types of work, often including practical and/or procedural activities. *The aim of TVET is to enable learners to meet needs of employers for qualified labour and/or own needs related to production of goods and services.* “Skills training” in general denotes development of qualifications in the same line, but with a more limited scope and volume of training, often focussing on performance of one task (e.g. operation of a specific machine) or a limited set of tasks (e.g. different types of welding).

At a UNESCO Expert Meeting held in Bonn, Germany, 25 to 28 October 2004, approaches and practices were presented to illustrate the contribution that TVET had made towards a more sustainable future. “*Learning for work, citizenship and a sustainable future*” is a joint responsibility of education, of the world of work, and of a variety of stakeholders in the formal and informal socio-economic environment.

It was contended that since education is considered the key to effective development strategies, technical and vocational education and training (TVET) must be the master key that can alleviate poverty, promote peace, conserve the environment, improve the quality of life for all and help achieve sustainable development. With this, TVET has to re-orient its agenda for action so as to continually provide scientific and technical skills in relevant and responsive programs, and consequentially develop a new generation of human resources.

In general context, Sustainable Development combines three principal aspects:

- **Economic:** An economically sustainable system must be able to produce goods and services on a continuing basis, and to avoid sectoral imbalances between such areas as agricultural and industrial production.
- **Environmental:** An environmentally sustainable system must maintain a stable resource base, avoiding over-exploitation of renewable resource systems, and depleting non-renewable resources only to the extent to which adequate substitutes can be developed. The concept includes maintenance of ecosystem functions such as biodiversity and atmospheric stability, thus addressing resources that are traditionally not considered as economic resources.
- **Social:** A socially sustainable system must achieve distributional equity, adequate provision of social services including health and education, gender equity, as well as political accountability and participation to promote active citizenship.

The overriding objective is quality of life.

TVET is a most effective means for society to develop its members' potentials to respond to the challenges of the future. However, schools and other institutions of the formal education system alone cannot achieve education and training for sustainable development in terms of human resources. In most African countries, oversight responsibility for TVET is shared in general between the ministries responsible for education or technical education and labour or employment, although some specialised vocational training programmes (in agriculture, health, transport, etc.) fall under the supervision of the sector ministries.

1.1. Rwanda scenario for human resources development through TVET:

In spite of Rwanda great geographic, economic, cultural and demographic diversity, it shares many common challenges and issues that are fundamental to improving the quality and relevance of TVET to gain a competitive edge in the market economy of the 21st century. Rwanda must consider a coherent strategy for human capital development in which TVET plays an important role. However, in order to effectively tackle this problem, human resource development plans must be clearly cast within, and simultaneously linked to, the economic development vision of Rwanda.

The success of TVET in any developing country can be considered a key indicator of the country's advancement in development. Any country that evolved into a technological advanced one, TVET must have played an active and vital role, as skilled manpower would have been required, also to enable its sustainability.

In Rwanda, Science and Technology in education is also emerging as a key priority area within the sector, recognising its role in human resource development for Rwanda. This forward-looking plan, based on declared targets and indicators is an instrument to make the Education Sector Policy operational and is designed to assist in reducing poverty within Rwanda while creating a foundation for our vision of economic development based upon applications of development skills and technology.

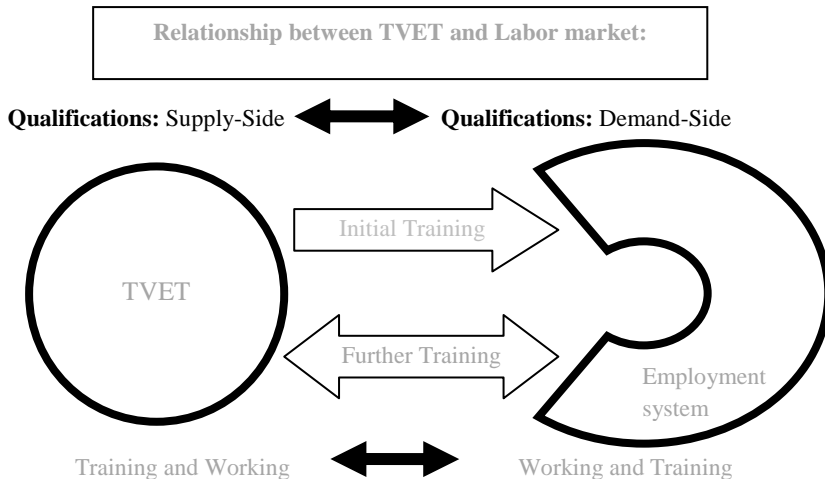
Furthermore, international competitiveness and employment creation serve as twin prerogatives in the context of Rwanda development. The provision of relevant and appropriate skills represents a significant element of the overall development pathway of the country. Skills development in all technical sector takes on an increasingly important role in virtually all dialogue of national development, more so in the advent of globalisation in an ever increasing knowledge economy. This provides the basis for international competitiveness.

Indeed, the capacity of any country to attract appropriate and relevant investment is dependent on the pool of skills available (Brown et al. 2001). The development of intermediate-level skills for example in Information and Communication Technology (ICT), therefore, holds the promise of international competitiveness by attracting much-needed investment opportunities and, in the Rwanda framework, in its ability to provide the basis for employment creation and human resources development. The role of ICT, which is also one of the key focus of TVET in national development, therefore, must not be underestimated.

Of course, reality is never so simple, which partly explains why TVET does not achieve acceptance by all. Most TVET implementers (relevant institution heads) point to the heavy expenses required to develop curricula, train staff and equip classrooms for these specialized subjects, which generally cost three times more than academic courses. Yet, for many parents and students it remains a 'second-class' education. The truth is that TVET provides training but not the guarantee of a job. Even the world's most sophisticated and expensive programme is doomed to fail if the labour market cannot absorb the students, despite their skills and expectations.

It must be recognized, that TVET is a complex differentiated socio-economic system by itself, which is influenced by involved individuals, state and companies/economy – which have partly different interests.

In this circumstance TVET has to be understood as a “service-provider” for *individuals, economy* and *society*.



In recognition of the service function of TVET regarding the labor market and its development there should exist relevant elements in TVET, which can address specific questions and demand of the labor market.

SEAMEO (2001) identified eleven important trends and directions for TVET in its member nations, as follows:

- Clear national policies for TVET;
- The concept of lifelong learning;
- Competency-based training (CBT);
- Development of demand-driven TVET;
- Flexible TVET delivery systems;
- Encouraging a competitive spirit among TVET providers;
- Strong public TVET systems;
- Recognition of TVET;
- Quality output and outcome;
- Research and evaluation to improve TVET;
- Apprenticeship systems.

From Rwandan working population index (Feb, 2005),

*Agriculture (88.6%); *Workers specialized in services (3.3%); *Laborers, non-agriculture unskilled workers and vehicle drivers (3.1%); *Business and traders (2.6%); *Professionals and assimilated associates (1.6%); and *Manufacturing industry (0.8%).

All hands must be on deck to promote TVET activities which is a key to skilled society. The success of this cannot be hinged outside adoption of the above trends and directions recommended by SEAMEO.

2. TCT as a catalyst of change for Human Resources Development in Rwanda

The question of how to reduce unemployment, under-employment and also reduce the mismatch between skills and jobs, while simultaneously creating the new productive jobs and improving quality of life of the worker, are some of the core issues that concern with human resources development. TCT has considered and at the same time addressing most of these issues by implementing appropriate curriculum, innovative teacher-training and strengthening skill and competencies development.

Tumba College of Technology (TCT) – Rwanda is national institution established in 2007 and officially inaugurated June 2008 to address the critical needs for technical and entrepreneurship skilled manpower, also improving the quality and relevance of TVET. The most critical areas viewed by the government necessitating TCT establishment were those that spur rapid development such as Information Technology (IT), Electronics & Telecommunication (ET) and Alternative Energy (AE). TCT is entirely devoted to the cause of strengthening training, research and development activities that facilitates human resources development.

TCT Mission

- To produce technicians with competent hands-on skills, work attitude and knowledge of A1 level
- To ensure high quality technical education relevant to the industrial and social needs

- To contribute to the economic development of Rwanda through providing the practical technicians to the industry and encouraging entrepreneurship

TCT Vision

- To be a leading technical education center of excellence contributing to the scientific and technological development of Rwanda and the region.
- To be a model institution creating new values through the activities of in-school venture and support of entrepreneurship.

TCT occupies a unique position in Rwanda technical education as it provides leadership and encourages innovations in TVET through:

1. Participation in national curriculum development and curriculum renewal
2. Training and upgrading of teachers and teacher trainers for improving quality
3. Integrating emerging areas of concern into TVET curriculum for sustainability and globalisation;
4. Promoting the concept of human resources development in Rwanda through collaborations with relevant institutions, organisations and industries.

TCT carries out its programs through strong partnership and collaboration with other local and international institutions, also Japan International Cooperation Agency (JICA), for maximizing efficiency and effectiveness. Acknowledging JICA immense support and successes of implementing TVET in some African countries, most prominently Ghana, Uganda, Malawi and others and its existing network in other countries further strengthens the contribution of TCT in the arena of TVET here in Rwanda.

TCT has a branch campus at Kigali where plans are already at advance stage to carryout regular academic programs and skill development packages in IT, ET and AE domain, also to serve as an interface with the industries. However, it is planned to have the following facilities in the branch.

➤ *Information Center*

TCT information center can be used by anyone. It includes the following kinds of information.

*TVET human resources * Job opportunities *Industrial training opportunities * New technologies
 * Digital archives * Alumni network * Soft-loan information, etc.

➤ *TCT Park*

Beside the regular academic programs to the students, the Branch Campus will be utilized for connecting TCT to the community and industry. As the interface to the outside world, TCT Park is planned for the following activities.

*Exhibition of fabricated/constructed technologies by students/trainees *Technologies of each department are demonstrated.

➤ *Trainings for other institutions*

Various kinds of training relevant to IT, ET and AE fields are been conducted for the technicians, company staff, and members of the society. Some of the training courses include the following:

Field	IT	ET	AE
Course	-Computer literacy -CCNA -Networking -Repairs of computer hardware -Software development	-Repairs and assembly of electronics and telecom equipment -Installation and maintenance of electronic security systems -Installation and maintenance of PABX systems	-Installation and maintenance of solar home systems -Design and construction of improved cooking stove -Design, construction and maintenance of Biogas systems

➤ *Incubations for entrepreneurship*

As a result of skill acquisition by most TCT graduates, they are expected to start their own business. With a view to promote this activity, a consultant has since been engaged where more than 50% of the final year students are supported. TCT incubates the entrepreneurs with various supports such as:

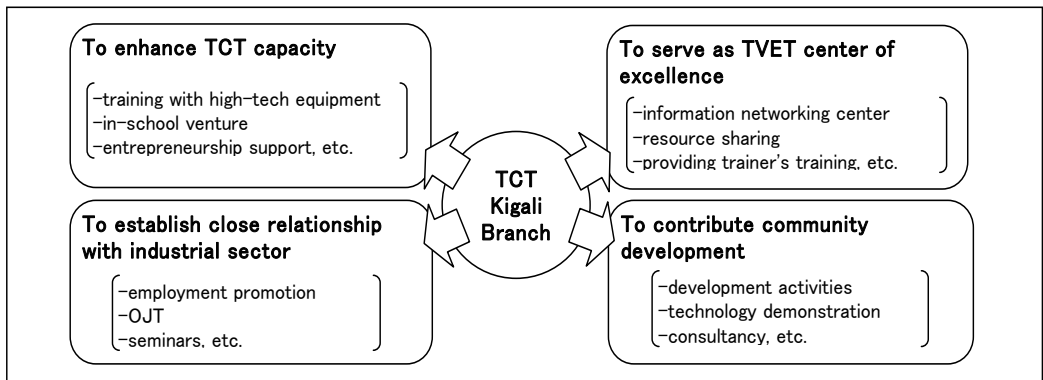
*Small office space with minimum facilities *Technical support *Financial advice
 *Information access.

➤ *Consultancy services*

Consultancy services are considered to be at the forefront of TCT targets as it has direct bearing on human resources development, as such this shall be effectively administered.

Over the last two years, TCT has contributed significantly in developing TVET in Rwanda through its programs. TCT activities enabled us to identify the issues, problems and strategies which are critical for effective human resources development through TVET. This paper is devoted to exploring the experiences related to emerging directions for human resources development through TVET and pinpointing some elements of success with focus on Rwanda.

Fig.1 Below shows a general overview of activities with TCT-Kigali campus.



2.1. TCT Technical Advisory Group (TAG) and Industry led curriculum:

TAG has been established for each department of TCT to enhance the relationship with public and private sectors. Since TCT started with three departments, each has its own TAG of which members consist of experts from the relevant industries and institutions. In order to get strong relationship with public and private sector as mentioned above TCT have formed the TAG members to advise and collaborate with development of TCT.

TAG members are made up of public and private sectors such a KIST, RURA, ELECTROGAZ, RITA, GTZ, MTN, RWANDATEL, ORINFOR, MININFRA, etc, and it is formulated for each department to support and ensure qualitative academic and appropriate training program of TCT. TAG workshop is usually held twice a year in every department with variety of agenda.

Formulating of TAG has three objectives:

- (1) To enhance the relationship between TCT and public/private sector.

- Information center for job opportunity
- Industrial attachment program
- Latest technical information

(2) To improve the academic and training programs of TCT.

- Staff training for TCT
- Consultancy
- Curriculum review
- Guest teacher

(3) To contribute to social development through collaboration between public/private sector and TCT.

- Providing training in the relevant field
- Seminars
- Collaboration research

- **Partnership with International Institutions**

TCT has also established a network with some technical institutions abroad that were successful in terms tremendous achievement with their contribution to their respective countries manpower. These institutions also had technical corporation and support from JICA, as such they were identified suitable for the collaboration. The institutions and cooperative activities are as follows.

Potential Institutions	Activities
- EEPIS (Surabaya, Indonesia)	- Exchange of the resources and information
- Tribuvan University (Kathmandu, Nepal)	- Conducting trainings for each other
- Technical Colleges (Japan)	- Collaboration research
- Dar-es-Salam University	- Masters program
- Training centers MALAWI, etc.	

For more information on the dynamism of TCT activities, visit www.tct.ac.rw.

Opportunities and challenges

Below are some of the key opportunities in TVET:

- Globalization is prompting governments to take renewed interest in TVET form of education.
- In nations where unemployment is endemic, TVET, particularly in areas fostering entrepreneurship and small enterprises, becomes increasingly important for the future. Tilak (2003) characterizes TVET as an ‘equity measure’ because it promotes ‘equity with a rural bias and serves the needs of relatively poor people’, as well as being an ‘antidote to urban-biased elite education’ (p. 675).
- There is no question as to the importance of skills development for reducing poverty
- The increasing importance that African governments now attach to TVET is reflected in the various Poverty Reduction Strategy Papers that governments have developed in collaboration with The World Bank.

For UNESCO, TVET goes beyond the narrow confines of economic planning. It is part of a larger vision for promoting sustainable development. Since its founding, UNESCO has been developing recommendations and organizing policy debates, while serving as a policy advisor for governments trying to reform or create vocational education systems.

Challenges:

- The urgent challenge is therefore to bridge the demand for jobs with the actual needs of society. Politically, governments cannot afford not to invest in the skills of future generations.
- The Image and Status of TVET has consistently faced problems as it is perceived by some as second-class. These difficulties must be met with a renewed effort to raise the public perception of TVET.
- The Promotion of TVET for Girls and Women, this is essentially an issue of access to TVET and, once girls and women enter TVET institutions, how they are received and accommodated. Attracting more female instructors and administrators into TVET is a major challenge in the future.
- TVET Facilities and Equipment: There is a major problem associated with high cost of construction, equipment, maintenance and the provision of consumable training materials. Routine and preventive maintenance have also constituted persistent problems.
- TVET Teachers’ Conditions of Service in most countries are not the same with those in academics, as such; it serves as a demotivating factor.
- Workplace Health and Safety: HIV/AIDS upon youth and working-age populations is a major challenge to be faced by TVET. HIV/AIDS, the very educative process is in jeopardy.
- TVET Curriculum Reform and Development effect on labour market. In other nations, for a variety of reasons, employers prefer to employ untrained youth or ‘academic’

- graduates and provide on-the-job training. One salient trend is the growing convergence between TVET and ‘academic’ curricula, resulting from technological change.
- Teaching and Learning: As TVET becomes increasingly more knowledge oriented, the role of the teachers and instructors must change from the didactic imparting of skills and knowledge to the facilitation of learning. Learners-centred.
 - TVET Planning: In most cases where TVET programs fails, appropriate and relevant parties are not involved at the planning stage.
 - Corruption: Most people restrict corruption to financial embezzlement. The worst aspect of it is related to policies that obscure TVET related programs which is capable of empowering the society with skills and competencies that could lead to standalones.

3. Conclusion:

One of the most critical challenges of this 21st century is the attainment of full employment and sustained economic growth in the global economy and social inclusivity. TVET can be synonymous to the backbone of quality life as it contributes significantly to promoting the interests of individuals, enterprises, economy and society. By making individuals employable and informed citizens, human resources development through TVET activities contribute to economic development and to achieving full employment and promoting social inclusion. They also help individuals to gain access to decent work and good jobs, and escape poverty and marginalization.

The economy becomes more productive, innovative and competitive through the existence of more skilled human potential. Human resources development and training also underpin the fundamental values of society – equity, justice, gender equality, nondiscrimination, social responsibility, and participation.

To revitalise the current status of TVET most particularly here at Rwanda, early identification of current and future skills needs which is part of a forward-looking strategy that reduces skills gaps has to be established by:

- adjusting the curriculum of initial education to current and future skills needs;
- enabling training providers to anticipate and forecast what skills are in demand currently and in the medium- to long-term, so as to ensure a better fit between jobs and skills;
- providing pertinent and timely information to all stakeholders in particular to displaced workers as well as those seeking better job opportunities to enable them to shift from declining to emerging sectors;

Therefore, to achieve Sustainable Development via TVET - TVET has to be strongly linked with the world of work in companies and other employers. Efforts to achieve TVET for realistic human resources development requires a systematic and / or cooperation in the international framework under this objective.

An international cooperation with above described objective should

- Be led by the certain relevant bodies
- Integrate and involve the competent and motivated actors
- Recognise relevant stakeholders
- Be able to attract the needed finances
- Enable an interdisciplinary work

- Ensure an exchange of lessons learnt and best practices
- To combine the resources in the areas of main common interest
- Identify and realise the related projects
- Cover in its activities the most important fields, which can contribute to a re-orientation of TVET towards the sustainable human resources development.

The Growing Importance of ICTs for TVET: The addition of ICTs to TVET programmes and curricula (preferably as part of a cross-curricular focus) will assist modernization of the field. Another important aspect of ICTs has been the exchange of TVET information between nations through the UNESCO-UNEVOC network (www.tvetipedia.org), the ILO network and other multi-lateral and non-governmental networks.

The task of human resources development is multi-dimensional task and must be undertaken in close partnership with government, non-government organisations and international agencies. Industry and private sectors must join hands in the process of human resources development. TCT has worked closely for the last three years with a vast network of institutions and organisations. Our experience gives us an edge to continue the partnership path.

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