

## **A Review of the Quality of Technical Teacher Training in Uganda: Implication for Global Competitiveness**

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### **Abstract**

*Competent Technical and Vocational education Teachers are critical in the training of a technologically able and skilled workforce that is globally competitive and can effectively contribute to sustainable economic growth and development. For technical teachers to be globally competitive, their training has to be based on a standard curriculum, the training has to be done by well qualified instructors, in modern, well equipped training facilities. In addition, globally competitive technical teachers need to have comprehensive technical and pedagogical training. Based on the theory-practice interaction and the Parallel technical and teacher training models, this paper explores what globally competitive technical teacher training should be and the extent to which technical teachers in Uganda are globally competitive. This paper advocates for a complete recast of Technical teacher training in Uganda in order to meet international standards. There is need to use new teaching and learning approaches. TVE teacher training should develop in trainees" extensive knowledge in modern technology. Training should provide a high degree of functionality in ICT and technological processes. Teacher trainees should be inculcated with skills of imparting generic learning skills to students through their instruction and organization of learning processes. Government needs to get fully involved in the making, standardisation and monitoring of technical teacher training in Uganda. Kyambogo and Makerere University should re-launch BTTE and subsequently masters and doctorate programs in TVE teacher training, in order to further concretise Technical teacher training in Uganda. These universities should also develop fully fledged departments of Technical Teacher Education so that they can place more emphasis on its development.*

**Key Words:** *Technical Teacher Training, Global Competitiveness*

### **INTRODUCTION**

Sustainable economical growth and development in developing countries, is heavily dependent on the country's training institutions' ability, to train competent technological, knowledgeable workers for today's workforce. The government of Uganda is currently promoting technical and vocational education as a major avenue for modernisation. Technical and Vocational Education (TVE) prepares learners who can do practical jobs, develops their expertise in technology and acquire skills that result into immediate employment (Ministry Of Education and Sports, 2001). However, a critical aspect to the training of a technologically competent and skilled workforce is the training of competent Technical and Vocational Education Teachers (Akim, 1998).

Uganda needs competent technical and vocational education teachers to develop and implement strategies and interventions that will increase the usefulness of this education to the country's economy (Rwendeire, 1993). Technical and vocational skills can only be vital for Uganda's development if technical and vocational schools can produce graduates who can use technological skills to cope with the current global challenges (Egau, 2001). Therefore, it is important that the majority of Uganda's population, men and women alike, develop basic functional, technological knowledge and skills from competent teachers.

In most parts of Africa, no meaningful attention has been given to Technical Vocational Education and Training (TVET) teachers. Besides, due to increased technological innovations and the demand for higher education and skills in the modern workplace, much more is demanded of a TVET teacher today than ever before (Kerre, 2010). National reviews of education and training reveal that almost 90% of vocational teachers and instructors working in the public vocational training system require continuous upgrading of training skills (Kerre, 2010).

Prior to 1957, virtually none of the TVE teachers in Uganda were professionally trained. During that time there were no institutions that trained TVE instructors as well as several qualified craftsmen who were

aspiring to become technical teachers. Most TVE instructors were hired for their occupational expertise and not necessarily for their teaching credentials. In fact, the first Technical and vocational trainers in Uganda were crafts men who had been trained by missionaries (Ssekamwa, 2000). Currently, Uganda has a number of institutions that train TVE teachers.

The first Technical and Vocational Teacher Training in Uganda was started in 1957 by Kampala Technical Institute and awarding a certificate (KTI) (Okello, 2005). This Certificate in Technical Teacher Education (CTTE) was awarded by Makerere University. In 1994, Uganda Technical College Kyambogo became Uganda Polytechnic Kyambogo (UPK) and it started to award CTTE. In 1999, UPK introduced a Diploma in Technical Teacher Education (DTTE) in addition to CTTE. DTTE provides two years training to students who have Advanced Crafts Certificates, and CTTE holders, who enter/join in the 2<sup>nd</sup> year.

In 2001, Uganda polytechnic become part of Kyambogo University and Bachelor of Technical Teacher Education (BTTE), was introduced. BTTE provides 4 years training to A' level, DTTE, and CTTE holders; 3 years to Ordinary diploma holders and 2 years to Higher National Diploma holders. Currently, a number of private and public institutions also offer CTTE and DTTE under affiliation to Kyambogo University. However, it is Kyambogo and Makerere Universities that offer bachelor of BTTE. In Makerere University BTTE was started in 2007. Unfortunately both programs were shelved, BTTE of Kyambogo in 2009, and of Makerere in 2012. Currently, Kyambogo University offers Bachelor of Vocational Studies (B.VOC) with Education and Bachelor of Education (B.ed) in Technological Studies that provides training to teachers of technical subjects in secondary schools. National Teachers Colleges affiliated to Kyambogo university offer diploma programmes in technological studies (Okello, 2005). Graduates teach technical subjects such as woodwork / carpentry, metal work, agriculture, technical drawing, power and energy to O-level and A-level students.

This paper explores whether programs that train technical education teachers in Uganda can produce globally competitive technical teachers. The paper begins by presenting a theoretical framework on globally competitive technical teacher training, then, reviews literature on effective training programs for TVE teachers, and briefly discusses the materials and methods. Finally a discussion that compares the findings with theory and literature review is given plus the conclusion and recommendations.

## **Theoretical Framework**

This paper is based on two theories of technical teacher training that underlie training of globally competitive technical teachers. These theories are the theory-practice interaction theory of Korthagen and Kessels (1999) and the Parallel technical and teacher training theory of McIntyre (1993). The salient issues in these theories related to technical teacher training are examined below.

***Theory-practice interaction theory.*** Korthagen and Kessels (1999) in their theory-practice interaction theory suggest that Technical Teacher Education (TTE) should prepare teachers who are effective and reflective. This can be achieved when TTE gives sound theoretical and practical grounding to teacher trainees. This training approach emphasises critical focus and technical or practical focus to teacher training. Birmingham (2004) calls this a collaborative teaching approach. The proportion of time trainees spend in the classroom, focusing on core technical and teaching skills, is reduced in favour of practical work in workshops and real teaching situations.

In case of teaching pedagogy, Khan (2005) advises that teacher trainees are provided training on job where they can observe and learn from great teachers. This will give the trainee practical experience in lesson planning, learner motivation, classroom behaviour control and learner assessment. Teacher trainees should also be given practical training in the technical fields which they will teach (Pearson, 1989). This is done by providing industrial training and supervised project work in their technical fields of specialisation (Lawlor, 1990). This kind of training is important because a teacher is not just a subject expert such as a carpenter or a mechanical engineer. The technical teachers are mentors and therefore, need to understand the technical field in its relation to other fields and a part of the overall education of students (O'Hear, 1988). TVE teachers, teach apprenticeship which is a very practical thing that should be done in a very practical work place. They have to think of ways of approaching things but doing it in a practical sense.

**Parallel technical and teacher training theory.** On the other hand the Parallel technical and teacher training theory indicates that the most effective mode of TVE teacher training is one that produces TVE teachers who are technically and pedagogically competent. McIntyre (1993) advises that for TVE teachers to be globally competitive, they need to have parallel technical and teacher training at the same time. Delannoy (2000) indicates that this type of dual course work prepares TVE teachers for two alternative professions: engineer, technician or technical teacher. Kadocsa and Koppony (2004) advise that in this type of training more time- about three quarters of the total training hours should concern engineering subjects, and one quarter of those have to centre on pedagogical subjects. In addition, students need to have some industrial placement as engineering assistants. They also need to complete practical engineering projects related to the solution of a real industrial problem guided by an industrial expert and a supervisor of the academic staff. This approach prepares TVE teachers to be more grounded in practical technological issues and it makes them more competent teachers of TVE. Teacher trainees then complete teaching practice in technical and vocational institutions. Teaching practice activities should be guided by a senior school instructor and a supervisor of the academic staff (UNESCO-UNEVOC, 2006). Experience indicates that competitive TVE requires technical teachers and instructors who can practically demonstrate to learners how to solve pertinent technological problems.

### **Training Globally Competitive Technical Teachers**

Effective training of technical teachers requires a clear training philosophy, effective training methods, using good learning materials by quality instructors, and training facilities. This section critically reviews literature on these aspects with regard to TVE teacher training.

**Training philosophy.** Effective TVET should be centred on enabling students learn how to solve practical issues as suggested by Altbach (1991). This implies that even their teachers should be trained using the same philosophy. TVE teachers should be trained to use technology to solve practical problems in their communities. This can be achieved if their training is centred on practical issues instead of just the use of technology. Burkhart (1996) argues that training of TVE teachers should centre on acquisition of critical skills such as research, navigation, information management (inference, analysis, synthesis, interpretation), and independent thinking. In this way they will be able to use technology as a tool for solving community, national and global problems.

In order for TVE teacher training to be relevant in solving problems, it has to emphasise development of appropriate technology. TVE student teachers need to learn technology that will provide clear benefits for students they will teach and not simply how to use the technology (Daugherty, 1997). Also The training should broaden awareness of technology with more emphasis on appropriate technology which is currently underused in the community as observed by Wadi, (2000). This implies that TVE student teachers should be taught to consider the types of technological resources currently available in their communities and schools adopt their learning to the use of local technology resources. Kadocsa and Koppony (2004) caution that if TVE teachers use unavailable and irreverent technology, this will result in lower innovation and creativity, yet they are the cradles of technology.

Daugherty (1997) indicates that in Saudi Arabia TVE teacher training combines a theoretical training in a Vocational discipline such as business administration, information technology, electrical technology, mechanical technology, automotive technology and construction technology with vocational pedagogy (learning how to teach technical subjects). Field practice (internships), vocational field practice (trial teaching situations in real TVET classes) and a practical bachelor project are included. This type of TVE teacher training produces teachers who can practically develop technical skills of their students. Technology is then taught practically instead of theoretically. As a result, we are able to have technicians with practical skills that they can use to develop their country.

**Training methods.** The quality of TVE teachers is dependent on the quality of training they have received. No professional is better than the quality of training he has received. This implies that globally competitive TVE teachers need to go through good training. The content, methods and means of technical teacher training should be based upon new approaches as advised by Vernon and Reynold (2011). New approaches that include longer industrial training and practical technology have been discovered to produce competent TVE instructors. Likewise, UNESCO (2002) advises that, new methods of training should be adopted together with new types of teaching materials. These new methods must also be

connected with the new types of assessment and evaluation. This training approach enhances the development of not only the memory but also the creativity and the capacity of doing practical work among TVE teachers Wadi, (2000). Modern technological innovations also require very close contacts with industries, for purposes of effective training and career guidance. This gives TVE teacher trainees opportunity to work in industries or even interact with other TVE stakeholders (UNESCO, 2005). As a result, they come in touch with the real technical world. This calls for TVE teacher training programmes to include practical experience acquired in industry.

Countries in Europe and Asia that have used this system have produced very competent TVET men and women who can work as technicians and at the same time teach technical subjects. China has used this approach, and it has brought it into the first world (China Vocational Education, 1999). TVE teachers in china are able to effectively use technical machines and run regular technology investigation projects with their students. This has given Chinese technicians the motivation to be innovative and this is why china is now more competitive in the global economy. Germany also has a very good TVET system as a result of implementing **Parallel technical and teacher training**. Schneider (2010) indicate that to be a TVET teacher in Germany one should have acquired university studies of at least three years in a vocational major (e.g. electrical engineering) and a non-vocational minor subject, as well as in pedagogy. The individual should also have obligatory 12-months' work experience in a technical industry. In addition, the person is supposed to acquire a two-year pre-service teacher training programme at a Vocational Education Teacher Training Institute (VETTI) combining work as a vocational school teacher with seminars in the major and minor areas of specialization. This kind of training emphasizes **reflective learning**, project work, business-process related learning, and development of occupational competencies (Bünning and Shilela, 2006).

**Training materials and facilities.** Competitive TVE teacher training requires use of modern training materials. Institutions that offer TVE teacher training programmes should have modern technology training facilities. Kerre (2010) indicates that universities need modern technical workshops and basic tools and equipment. This enables hands on technology training. Inadequate workshops and tools in universities may lead to theoretical training that produces half baked TVE teachers. Studies done across Africa indicate that most universities that offer TVE teacher training have inadequate training materials or are outdated and not relevant to what is needed for specific skills development. This has resulted into TVE teaching and training that has little relevance for what students have to face in the world of work after they have left training institutions. This makes them half baked and may not be able to compete with well trained teachers from developed countries (Kilemi, 2002).

## MATERIALS AND METHODS

The overall research design encompassed a detailed literature review, interviews, observations and documentary analysis and synthesis of data collected from TVE teacher institutions in Uganda and key informant interviews. A literature review exploring models on how competitive TVE teachers are trained was done. Then, the researcher analyzed current TVE teacher training using curriculum documents from TVE teacher training institutions in Uganda and also observed their training facilities. Finally, key informant interviews with heads of departments of TVE teacher training departments and technical teachers with instructors in the institutions were done to supplement on findings from documentary analysis and observations.

The data collected were analyzed and presented in the discussion section of this paper. The documentary analysis and key informant interviews provided opportunity to understand how teaching and learning skills, strategies and theories for training globally competitive TVE teachers, identified in the literature review, are being used in practice. The approach to the analysis broadly drew on grounded theory. Strauss and Corbin (1998) techniques of grounded theory analysis were used. The interview transcripts, curriculum documents and observation notes were scanned to acquire relevant ideas and themes. Data was broken down, examined, compared, conceptualized and categorized to identify meaning that was significant and important. As recommended by Crooks (2001), grounded theory analysis was more suitable due to the fact that there was little available exploration of the contextual factors affecting training of globally competitive TVET teachers in Uganda.

## DISCUSSION

This section evaluates the quality of Uganda's TVE teacher training programs in light of literature and documentary review. Literature has indicated that quality TVE teacher training programs need to have a large proportion of technology training, place emphasis on appropriate technology, encourage good training, and develop effective peer learning and on-going profession development.

### Technical Teacher Training in Uganda

Literature has indicated that for TVE teachers to be globally competitive, they need to have both technical (practical) and pedagogy training. However, examination of TVE teacher training curricula from training institutions revealed that TVE teacher training in Uganda provides about 90% of training in education pedagogy and only about 10% in technology. A look at CTTE, DTTE and BTTE curricula (KAL Institute of Technical Teacher Education, 2008) shows that more than three quarters of course units are on pedagogy. While this practice produces technical teachers who are well grounded in instruction methods, they may lack capacity to teach practical technological aspects. Experience indicates that in order for them to be globally competitive TVE instructors should be able to practically demonstrate to learners how to solve pertinent technological problems.

Kyambogo University's BTTE was suspended in 2009 because the majority of its graduates who did not have prior technical background were not being recruited by the ministry of education to teach in TVET institutions. This was so, because, they could not teach technical (practical) subjects effectively. Key informants intimated that the program is under review to include craft and technical courses in the first year. Makerere University program was also shelved in 2012 because it was theoretical and graduates were not able to competently teach technical subjects. This programme is being reviewed to make it more practical. Currently, the only degree programme in technical teacher education that is being run in the whole country by public university is the Bachelor in Vocational Education (B. VOC) of Kyambogo University. Graduates of this programme only teach in secondary schools and are not competent enough to teach in TVET institutions. The only private university that offer BTTE is Ndejje University.

This implies that the majority of TVE teachers in Uganda are not technologically competent. Many cannot get employment in industries as technicians because they are not well grounded in technology. This reflects that they teach practical aspects of technology theoretically. As a result, they are not able to develop practical technological skills in their students. Students without practical skills cannot be globally competitive.

Modern technological Innovations also require very close contacts with industries and other stakeholders, including employment services, and labour market institutions, for purposes of effective teaching/training and career guidance. This aspect is not emphasised in Technical and instructor teacher training in Uganda. TVE teachers are not given opportunity to work in industries or even interact with other TVE stakeholders. As a result TVE teachers in Uganda are out of touch with the real technical world. This renders them less competitive in the global labour market. This calls for programmes to include practical experience acquired in industry.

China has used the parallel technical and teacher training approach, and it has brought it into the first world (China Vocational Education, 1999). TVE teachers in china are able to effectively use technical machines and run regular technology investigation projects with their students. This has given Chinese technicians the motivation to be innovative and this is why China is now more competitive in the global economy.

### Training Philosophy

Literature has shown that TVE teachers need to teach students technology that will provide clear benefits for them and not simply how to use the technology. This creates interest and an incentive to learn among students, which makes them more competitive. However, all TVE teacher training curricula that were examined lacked significant aspects of appropriate technology. TVE teacher trainees receive no training in appropriate technology. This implies that they are not able to pass these skills to their students. For example while new technical courses such as saloon and hair dressing, solar energy production, film and

cinema production are very marketable in Uganda, TVE teacher training does not target these areas. An examination of CTTE, DTTE and BTTE curricula shows that TVE teachers are not given training in these modern technical courses. Teacher trainees with the traditional competencies such as carpentry, building, tailoring are targeted, yet the market shows that prospective students are no longer interested in these fields. The USA has very competitive TVE programmes. This is because their TVE teacher training institutions place emphasis on modern and appropriate technology. For example, the Red River Community College offers a variety of TVE teacher training programs in appropriate technology. This practice has increased the popularity of TVE in USA. In fact, the majority of workers who sustain USA industries are graduates of TVET. TVE teacher training in Uganda is still very conservative and oblivious to modern technical training. This makes her graduates less competitive in the global market.

### **Training Methods**

Effective, TVE teacher training programmes need to have good training techniques. Training is dependent on the quality of the curriculum. However, TVE teacher training in Uganda currently lacks a standard curriculum. The current TVE teacher training curricula has been made by individual institutions. There has been no input by the government department responsible for TVET in Uganda. Some of the aspects in the curricula are not relevant enough to produce a competent trainer of Technicians. For example the curriculum has very little appropriate technology and ICT training. An examination of training programmes indicated that Training is mostly theoretical. The programmes had very few practical course units. There was very limited time for practical and workshop training. This implies that TVE teacher training curricula in Uganda is a weak point in the teacher training chain.

Some lecturers with little or no exposure to the world of work prepared the curricula. The CTTE, DTTE and BTTE programmes also indicate that previously adopted curricula was just extended by incorporating new content without scrapping outdated, irrelevant material. Thus curricula are not able to close the gap between TVE teacher training and employment needs and opportunities. As a result, TVE teachers who are not able to meet current employment needs and opportunities are produced. These cannot be competitive neither can they train competent technicians. BTNET cannot regulate TVET when they do not make teacher training curricula. This implies that BTNET cannot ensure quality training of TVE teachers. Therefore training institutions can compromise teacher training quality at will in case they face resource challenges.

### **Training Facilities**

Due to limited government support, all TVE teacher training institutions observed lack modern technology training facilities. Some training institutions did not even have any technical workshops. In universities, teacher trainees did not get opportunity to have practical training. Key informants revealed that the workshops were always occupied by engineering students. Observations indicated that the quality of available facilities in TVE teacher training institutions was poor. Workshops and basic tools and equipment were lacking. Practical aspects of training were done theoretically. Key informants further said that, this had led to loss of interest in TVE teacher training by prospective students. Therefore, teaching and training materials in TVE teacher training institutions are inadequate or outdated and not relevant to what is needed for specific skills development. Key informants also intimated that the teaching and training materials are of little relevance for what the students have to face in the world of work after they leave training institutions. This makes them half baked and may not be able to compete with well trained instructors from developed countries.

In addition, the ministry of education has not provided a clear career path for becoming a technical teacher or trainer in TVET and there are no clear stages of technical teacher training either. Government funds very few Pre-service technical teacher and instructor programmes. A few students in Nakawa Vocational and Abilonino Community Polytechnic Instructor College are funded by government. There are no in-service programmes for teachers and instructors funded by government. This has created difficulties for personnel working in a sector such as TVET, which is highly dependent on innovations and technology driven, to function effectively without their own training support framework. This implies that TVE teacher training in Uganda is not well planned and standardised and therefore does not produce globally competitive graduates

Egau (2001) indicates that a major factor that influences success of technical teacher training in developing countries is the management support at institutional and national level. The management of institutions training technical teachers plays a big role in promoting quality technical education trainers. However, she notes that the management of most of TVE teacher training in Uganda is ineffective. Key informants from some private institutions indicated that they cannot afford to pay teachers and buy training equipment. They are also not able to promote effective TVE teacher training. Yet the quality of education and training depends a great deal on the ability of institutions to adjust the content of training to meet changing skill needs. Training curricula indicated that the tendency to equate teaching and training in TVET with pure lecturing is still strong. Yet this is not suitable preparation for lifelong learning where new problems and unknown job and skill requirements require ongoing problem solving. Training for strategic occupations that are rapidly changing under the impact of new technology require a multi-disciplinary approach which involves professional groups and representatives of industry (Rwendeire, 1993). However, most of the TVE teacher training institutions in Uganda still use the lecture approach. As a result they produce incompetent graduates. These graduates cannot compete in the global market.

The above observations are supported by the recent Ministry of Education and Sports effort through the department of Teacher Instructor Education and Training (TIET) to harmonise technical teacher and instructor training in Uganda. TIET in collaboration with stakeholders; Kyambogo University, Nakawa VTI, Abilonino CPIC, Jinja VTI, and KAL Institute of Technical Teacher Education with the support of Japan International Cooperation Agency(JICA) have developed a sustainable diploma in instructor technical teacher education (DITTE) curriculum to be implemented soon. There are high hopes that the products (technical teacher and instructor) of this curriculum will be globally competitive. The curriculum has harmonised the CTTE, CVTI, DVTI, and DTTE, thus a standardised TVE technical teacher and instructor training curriculum.

## CONCLUSION AND RECOMMENDATIONS

This paper has reviewed what globally competitive technical teacher training should be and the extent to which technical teachers in Uganda are globally competitive. The literature review and documentary analysis has indicated that technical teacher training in Uganda still falls far below international standards. The paper advocates a complete rethinking of design, implementation and evaluation of TVE teacher training in Uganda if it is to train globally competitive teachers. Technical Vocational Education Teacher Training in Uganda should open up the training approaches by applying effective application of new teaching/learning approaches. There is need to liberalise training for TVE teachers so that they can acquire teaching competencies that are appreciated by industries and students.

TVE teacher training in Uganda should provide a high degree of functionality in ICT and technological processes and equip teacher trainees with the ability to impart generic learning skills to students through their instruction and organization of learning processes. Teacher trainees need to be trained with the skills to function collaboratively in a team and change as necessary in teaching practice. Teacher trainees also need the capacity to innovate and impart innovation in learning. Government needs to get heavily involved in the making, standardisation and monitoring of technical teacher training in Uganda.

Kyambogo University and Makerere University in collaboration with the Ministry of Education and Sports through the TIET department should complete the restructuring of BTTE curricula and launch it so that they can embark on designing masters and doctorate programs as it is in Kenya. In addition, Kyambogo University should have a fully fledged department of Technical Teacher Education as opposed to a section.

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