Skills for Employability:

The Role of Information & Communication Technologies

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Prepared by:
Denise Clarke and Lina Palmer

GESCI
9th Floor, Unga House, Westlands
Nairobi, Kenya
Office: +254 20 370 6060/1
www.gesci.org

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1. Technical and Vocational Skills Development – an introduction

Although there are few direct references to Technical and Vocational Skills Development (TVSD)[1] in the Millennium Development Goals and Poverty Reduction Strategy Papers, the development of employable skills by Africa's youth has emerged as a prioritised area for many countries in Sub-Saharan Africa, regional bodies, and development partners since the beginning of the 21st century. An overview of official development assistance figures shows that TVSD has not received much attention and financial assistance in recent history. Bilateral funding from Development Assistance Committee (DAC) countries to the education sector on average received between 11-15% of total annual funding in years 2002 to 2008 (financial commitments summing up to USD 83 billion in 2008) while TVSD on average claimed only 2%. The financial assistance availed to education from multilateral donors was approximately a third of the total bilateral assistance and TVSD on average received only 1% of these funds during the same time period (International Labour Office 2011).

Africa has the largest percentage of young people anywhere in the world (over 60 per cent of the population being between 15 and 25 years old). African youth faces very high unemployment rates at the same time as they constitute a vast reservoir of talent, skills and opportunity that through smart interventions can be transformed into a productive workforce (African Economic Outlook 2011). The UNESCO International Experts Meeting's Bonn Declaration has stated 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."* (UNESCO 2004, p107). OECD and the African Development Bank have also identified TVSD as a key response to training a skilled and globally competitive workforce in its 2008 African Economic Outlook, acknowledging that private investments in Africa often are constrained by a lack of local skilled labour (OECD/AfDB 2008). Regional bodies such as the African Union (AU), the Economic Community of West African States (ECOWAS) and East African Community also place TVET high up on their agendas. For example, AU rates TVSD as one of its seven priority areas for investment in the continent in its Plan for Action for the Second Decade of Education (2006-2015) and has adopted a policy framework for TVSD in Africa (African Union 2007). The crucial role TVSD can play in the acquisition of employable skills by the youth and in the sustainable economic development of the African continent is also emphasised in the Association for the Development of Education in Africa (ADEA) 2008 Biennale and, the further focus in the 2011 Triennale, where "Promoting critical knowledge, skills and qualifications for sustainable development in Africa: how to design and implement an effective response by education and training systems?" (ADEA 2011, Hoppers 2008).

Research in Sub-Saharan Africa shows that improved access to and quality of skills development is critical to addressing youth unemployment (World Bank 2008) and the annual eLearning Africa conference on Information and Communication Technologies (ICT) for development, education and training will have youth, skills and employability as its focus in 2011. Appropriate skills development programmes feature prominently in strategies to facilitate the transition of young people to the world of work, and many countries in Sub-Saharan Africa are taking on policy activities on training for both the formal and the informal sector (King & Palmer 2010). TVSD is increasingly seen as an important sector to solve one of our major development challenges.

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[1] Technical, Vocational Education & Training has been the traditional term used for Skills Development initiatives within the formal schooling system whereas initiatives taken on by the informal sector have been using the newer and broader "Skills Development" term. Recent research marries the two terms to recognise skills acquired from different learning environments and hence use the term Technical and Vocational Skills Development (TVSD). An overview of various terminologies used for technical and vocational skills development by selected countries are found in Appendix 1.

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2. Individual challenges yet common priority areas and responses

While it is readily seen that each Sub-Saharan African country faces its own set of challenges regarding TVSD, some common priority areas have been noted in the literature. These include but are not limited to (African Union 2007; International Vocational Education Training Association 2008, UNESCO 2009):

- Modernisation of curriculum and increased relevance of TVSD education (low quality of training due to emphasis on theory and certification rather than on skills acquisition and proficiency testing, outdated materials/technology/equipment)

- Aligning TVSD provision with industry demand

- Introduction of competency based training

- Strengthening of business management, entrepreneurship and traditional handicraft skills in course provision

- Instructor training and professionalization of national TVSD staff

- Gender stereotyping

- Expansion of enrolment capacity

- Development of National Qualification Frameworks (NQFs)

- Uncoordinated, unregulated and fragmented country delivery systems and policies following the cross-sectoral nature of TVSD

- Harmonisation of TVSD programmes and qualifications within the region

- Funding and equipping of TVSD institutions

- Improving the public perception of TVSD

So far these challenges have mainly been addressed through the following measures (ADEA 2011, African Union 2007, Hoppers 2008, King & Palmer 2010, Technical Education Vocational and Educational Training Authority Zambia 2010):

- **Establishment of national coordination bodies.** An effective coordination mechanism is a prerequisite for all other areas of TVSD reform. To be efficient, national coordination bodies should consist of a balanced mix of key government and non-government stakeholders, and employers (representing the demand perspective on desired skills), be given real authority and focus on macro issues (i.e. not be involved in administration of the actual institutions). For example this kind of coordinating body have been established in Tanzania (Vocational Education and Training Authority), Mauritius (The Industrial Vocational Training Board), Ghana (Council for Technical and Vocational Training), South Africa (National Skills Authority), Zambia (Technical Education and Vocational Education and Training Authority) on the African continent.

- **Creation of closer links between TVSD provision and the labour market.** This is mainly done through a) introduction of Competency Based Training (CBT), b) seeking greater involvement of the private sector, c) allowing training institutions greater autonomy, d) encouraging TVSD labour market linkages based on incentives and financial measures, and e) improving information systems to accurately identify the skills needs of the formal and informal sectors. India, Mauritius, South Africa and Mozambique are examples of countries that have introduced measures like this.

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- **Improving quality through developing training standards.** Development of NQFs with employers associations' input and involvement against which TVSD institutions are measured on an annual basis. However, NQFs have proven difficult to develop and implement and risk becoming rigid, especially in the setting of developing countries. CBT approaches many times offer a better option. Australia, Tanzania, Rwanda, Nigeria and Uganda provide examples of countries where NQFs and CBT approaches have been introduced or are under development.

- **Enhancing the portability of skills**, facilitating transferability within the education system and between occupations, as well as the recognition of acquired skills. NQFs and CBT can increase the portability of skills, and the recognition of skills requires evaluation and certification based upon demonstrable competency. CBT often means a modular approach to TVSD into specific demand-orientated competencies and subsequent assessments, and it's important to engage with formal industry and informal micro-enterprise sector in developing a CBT approach. African Union Commission's "Strategy to revitalize TVET in Africa" and Economic Community Of West African States' "Abuja Process" are examples of initiatives targeting to facilitate portability of skills and also countries such as Tunisia, South Korea, Ghana and Cameroon have taken on reforms in this area.

- **Restructuring the financial provision for training.** Training levies, cost sharing with users, institutional income generation, and increased private training providers are mechanisms introduced to mobilise resources for TVSD systems. Separation of financing from training provision, performance based budgeting and skills development funds are also mechanisms that have been established to make TVSD systems more efficient and market responsive. Measures of this sort have been taken by for example Chile. Mauritius, Singapore, Bangladesh and Zambia.

- **Improving information systems** to enable evidence-based planning. Measures to capture accurate and up to date labour market information and skill demand as well as data on quality of training and equality issues have been taken to reduce information asymmetries and skill mismatches, for example in Ghana, Jordan and Zambia.

- **Encouraging extended provision of TVSD through the private sector.** Through government subsidies, grants or non-monetary incentives countries are also creating an enabling environment for private providers of TVSD. Formal enterprise-based training has been an important part of TVSD systems in countries such as Japan, South Korea and Singapore while private informal apprenticeships and private training in the informal economy forms an important part of TVSD in Africa. Adequate quality assurance mechanisms need to be established but it offers a way to extend the opportunities to TVSD.

- **Introducing TVSD at secondary education level.** Reforms seeking to vocationalise secondary education have not been found to work very well in enabling youth to enter the labour market, more success has been achieved through full-time TVET schooling. However, development of basic ICT skills has become almost a necessary vocational content to introduce already at secondary school level as part of the general education.

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3. ICT – could they add value?

The potential of emerging technologies in the African socio-economic development landscape suggests that innovation is only just beginning. African mobile communications growth since 2000 has significantly outpaced expansion in any other global region (Kapstein 2009). The vision of the past decade of internet cafes and telecentres to open up enterprises in every African village, has been replaced by a much more potent vision: that of a supercomputer in the pocket of every African, already evidenced in the exponential growth of smartphones on the continent. With improved connectivity by way of undersea cables, it is estimated that 69% of mobile phones in Africa will have internet access by 2014 (Ledgard 2011) and young people tend to be early adopters of the emerging technologies.

Many Sub-Saharan African countries are expecting the ICT revolution to spur their socio-economic development and transition into knowledge-based information societies judging by existing ICT for Development and ICT in Education policies.[2] Nevertheless, traditional educational practice fails to support the use of these technologies for addressing the challenges of youth training and skills development. There are few areas of modern work life that have not been subject to continuous innovation through adopting new technologies in recent years. However, limited outreach of necessary national ICT infrastructure (particularly Internet connectivity) and substantial costs for developing this infrastructure have hindered the use of ICT in TVSD delivery in many developing countries. As a consequence many TVSD graduates students lack what employers recognize as relevant skills.

ICT infrastructure is improving fast, especially in East Africa, and with this the possibilities of integrating ICT into TVSD programmes and thereby improve both the quality and relevance of training as well as increase access to it. The use of ICT to deliver TVSD courses, in both formal and informal settings, will assume even greater importance in enhancing delivery and modernisation of the field in the near future and as one example it can be mentioned that eLearning Africa in 2011 has the potential use of ICT for youth, skills and employability on the agenda eLearning Africa (2011). Policy-makers need to respond by creating their own transformational initiatives to harness the technological revolution for the benefit of education and training.

ICT offer various possibilities to improve the quality and relevance of TVSD. The rapid spread of mobile phones with Internet access, as well as of low cost computers, in recent years has opened up large possibilities of personalised, virtual learning. These have already been taken advantage of by open universities systems world-wide. For many TVSD initiatives these new ICT-enabled opportunities may provide a valuable supplement to the theoretical and conceptual aspects of TVSD, and ensure graduates' development of skills applicable to industry procedures of today, even though they perhaps cannot replace its hands-on practice and assessment (Department for International Development 2007).

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[2] For example Ghana[2], Kenya[2], Rwanda[2] and Zambia[2] are a few examples of countries with such existing policy frameworks:
The Ghana ICT for Accelerated Development Policy (2003);
Kenya Vision 2030 & Kenya Ministry of Information and Communications, Strategic Plan 2006-2010;
Rwanda Vision 2020 & Rwanda National ICT Infrastructure Plan (NICI-2010) ;
Zambia Ministry of Communications and Transport, National Information and Communications Technology Policy (2005)

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3.1 Reequipping TVSD through ICT

TVSD is often suffering from outdated curricula that are perceived as too theoretical and focused on certification rather than skills acquisition and proficiency testing. Additionally, most vocational areas today rely on ICT to a large extent and require that people working in these areas have both basic ICT skills and vocation specific knowledge of software packages. There are few areas of modern work life, independent of vocational area, where operational procedures have not been subject to constant innovation and improvements in recent years (International Labour Office 2011). By not having ICT represented in the curriculum students come out from TVSD institutions with skills that don't respond to the demands of the industry. But continuous innovation through technology also means continuously changing requirements on skills from employers why the curricula cannot be static; they have to be competency based and leave room for flexibility regarding which tools, software, techniques that are best suited to carry out a task.

Through modernising the TVSD curriculum, developing competency-based curricula and integrating ICT as a core curricula subject that cuts across all subject areas, vocational training provision can be made more relevant. Increased use of simulation software would enhance students' understanding of complex processes and components and these simulations even show potential of substituting some of the 'hands-on' workshop training that otherwise is required. Further, knowledge of vocation specific software packages is increasingly demanded by industry and for students to be equipped with relevant skills they need to master these tools (Rauner & McLean 2009). Many countries in Sub-Saharan Africa, for example Ghana, Kenya, Rwanda and South Africa, are also targeting new business sectors (such as Business Process Outsourcing, IT and Manufacturing) where technology plays an important role and hence require skills development for a rapidly changing work environment (Biztech Africa 2010). In these settings the role of ICT in TVSD becomes particularly important.

Since many African countries remain challenged by uncoordinated, unregulated and fragmented country delivery systems and policies within the field of TVSD, interventions to revitalize TVSD through ICT will have to be supported by a proper policy framework that embraces an ICT integration strategy and acknowledges the importance of developing students' 21st Century Skills. Combined with such policy frameworks competency-based curricula that integrate both basic ICT skills and vocation specific ICT skills hold potential to improve the quality of training and equipping students with relevant practical skills that are attractive to the labour market.[3]

3.2 Redefining Lecturer Competencies: the role of ICT

Instructor training and professionalization of national TVSD staff is also a general challenge threatening the relevance and quality of TVSD. Lecturers and instructors must be empowered in their efforts to transfer relevant skills and knowledge to students that respond to industry demand and efficient ICT deployment is fundamental in this. A revitalized TVSD system and curricula that integrate the use of ICT additionally require new skill sets also with lecturers and instructors working within the field why professional development interventions becomes a necessity.

Development of ICT competency framework and methodologies for how to train lecturers and instructors to acquire these competencies is a way to empower the TVSD workforce in their work towards enhanced TVSD delivery. Work has already been undertaken to contextualize UNESCO's ICT competency standards for teachers (UNESCO ICT Competency Framework for Teachers 2011)

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[3] GESCI has produced brief case studies on TVET Policy and Governance Reforms, and Conducting Baseline to inform TIVET policy development and strategic planning in Ghana and Kenya respectively. These can be found in GESCI's paper "Re-engineering Education and Training for Economic and Social Development in the 21st Century: A Focus on Technology and Skills Development in National Education and Training Systems in Africa" available at www.gesci.org

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to national levels, making these competency standards applicable to teachers/lecturers/instructors in their daily working environment, and provides guidance to institutional management's professional development efforts and concrete examples for lecturers aiming at developing their ICT skills.[4] Through established national ICT competency frameworks for lecturers and instructors that set the standard for training institutes responsible for future lecturer/instructor provision in combination with professional development initiatives aimed at taking currently tutoring staff to an ICT literate level, the high quality tutoring required for relevant TVSD provision can be achieved.

3.3 ICT enable new learning pathways

Blended learning approaches relying on ICT delivery mechanisms could also be very useful in developing flexible, modular and competency based TVSD programmes. The current TVSD system with two year full-time studies as the norm is not always suitable for target groups such as disadvantaged youth, they simply can't afford to study for two full years and there is no guarantee they will get employed afterwards. Also, those who already have a job and need to upgrade their skills find it difficult to be away from their workplace for a longer period of time since they are rarely guaranteed to retain their existing employment after the study leave.

Through a flexible approach TVSD can take place at times convenient to the students and in parallel to other engagements why barriers to training such as time and travel can be diminished. Shorter, targeted and flexible TVSD courses that focus upon selected modules of the current TVSD curriculum - providing basic, intermediate or advanced specific and relevant vocational skills - would help disadvantaged youth and those who need to improve their skills and knowledge gain or retain their employment or even start up their own businesses. As a complement to existing TVSD course offerings, shorter concise and flexible TVSD courses that rely on blended learning methodologies that combine traditional "face-to-face" methods of training (classroom lectures and practical exercises) with ICT-enabled distance learning methods (a combination of online/web-based, mobile phone and "offline" electronic delivery mechanisms) could expand access to and enrolment in vocational training. Electronic course content could consist of filmed tutor led lectures, e-learning modules, exercise scenarios, simulations, electronic resource libraries etc. and automated support systems using reminders of upcoming lectures, tasks and exams via text messages sent to participants' mobile phones could be deployed to keep track of participants and keep them engaged throughout the blended-learning course.

Besides the potential to increase access to TVSD training and expand the enrolment capacity of existing TVSD institutions electronic content used in ICT enabled blended learning training courses could also be used as teaching materials in "regular TVSD courses" and this way also improve the quality and delivery of existing full-time courses. A "modern" and blended learning approach to TVSD could additionally generate a positive effect in improving the public perception of TVSD by offsetting the old fashioned image of the vocational education field.

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[4] For example GESCI has recent and ongoing engagement related to this in Kenya, Rwanda, Nigeria and Tanzania. A brief case study on how Kenya has taken on the process of defining ICT competency standards for TIVET lecturers and instructors is found in GESCI's paper "Re-engineering Education and Training for Economic and Social Development in the 21st Century: A Focus on Technology and Skills Development in National Education and Training Systems in Africa" available at www.gesci.org.

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4. TVSD for future labour market needs requires ICT integration

The education and training systems of Sub-Saharan African countries are under increasing pressure to address issues that affect the very core of their countries' economic and social development. The preparation of graduates for jobs – both those demanded now, as well as those projected - with the required skills, abilities and competencies for the 21st Century knowledge based-economy and marketplace is a long and complex process which requires an integrated, holistic and inter-sectoral approach guided by strong leaders.

The possibilities in efficient deployment of ICT to modernise TVSD curricula, increase relevance of skills provision and expand enrolment capacity of institutions should be harnessed. Innovation, technology and market developments have turned the world of work into a fast changing environment and TVSD training must be carried out to match this reality. Many jobs of the future do not even exist yet, still we're facing the challenge of equipping a growing young workforce with the skills required to deliver in such roles. Not to mention re-equipping the current workforce with the skills required to keep up with this new reality (International Labour Office 2011). ICT have a central role to play in bridging the TVSD learning environment to the world of work. With increasing outreach of infrastructure and connectivity and constantly declining costs for equipment ICT integration to TVSD is within reach.

The growth potential of ICT, Business Process Outsourcing and even Knowledge Process Outsourcing sectors is acknowledged by many African countries (for example Kenya, Ghana, Egypt, South Africa, Rwanda) and hence expected to become increasingly important sectors for job creation. TVSD is to a large extent seen as the natural segment of the education and training system to counteract the shortage of skilled people available to these growth sectors and hence the TVSD system needs to be given a push to develop these many times ICT-intensive skills.

In summary, TVSD should efficiently incorporate ICT to;

- Improve the quality of training and equip graduates with skills relevant to industry demands. This is required to respond to existing industry demands but also to ensure a TVSD sector that is responsive to a continuously changing labour market and new emerging business sectors that many times are technology intensive. TVSD needs to be reequipped with modern curricula and policy formulation to develop youth with relevant employable skills.

- Empower lecturers in their efforts to transfer relevant skills and knowledge to TVSD students. Lecturer competencies must be redefined to efficiently include ICT and pedagogical development as a part of enabling lecturers' delivery of high quality and relevant TVSD training.

- Increase access to TVSD through enabling new learning pathways. Opportunities to expand enrolment to TVSD can be seized through ICT enabled blended learning methodologies that complement regular TVSD course offerings. Flexible and modular TVSD opportunities can play an important role in bridging the skills gap recognised by many growth sectors.

It's time to invest in TVSD to develop the skills required by African youth in the 21st Century and these investments should take advantage of the power inherent in new media to revitalize the field. ICT are not the one stop shop to solve all challenges faced by TVSD systems but hold the potential of making a significant difference.

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Appendix 1: Terminologies for technical and vocational skills development by selected countries

Country	Acronyms	Scope/Definition
Ethiopia	TVET – Technical Vocational Education and Training	TVET policy concentrates on institution-based training; this includes public and private vocational education TVET schools and skills development centres. While ongoing formal and informal non and training public and private company-based training (including informal on-the-job apprenticeship training) accounts for a large majority of trainees, job seekers (creators) and working people, these different training approaches are not yet part of the over-all training system; but are recognized as part of TVET.
Ghana	TVET – Technical Vocational Education and Training	The formal TVET sub-system consists of institutions that provide classroom and vocational education workshop-based instruction. They follow written curricula and students take formal and training examinations for which certificates are awarded. Non-formal TVET covers the traditional apprenticeship system, on-the-job training and all those skills training activities that do not lead to formal certification.
Kenya	TIVET – Technical, industrial, vocational and entrepreneurship training	Includes technical training institutions, MSE training and demonstration centres, youth vocational and polytechnics and national youth service skills development centres.
Rwanda	VET – Vocational Education and Training (some times also called technical educational and vocational training)	Refers to skills developed in the private or government sectors, civil society or public and training owned schools. Includes the *Ecole Technique Officielle* (upper-secondary technical and vocational schools); College of Technology (post- secondary, diploma level). Basic education also encompasses vocational training for young people and adults, e.g. the Youth Training Centers (*Centre de Formation des Jeunes*).
South Africa	Skills Development (Department of Labour) VET sometimes used FET (Department of Education)	Skills development is used in most official government documents (e.g. Republic of South Africa, 2005 – National Skills Development Strategy). It refers to the development of skills for key sectors in both the first and second economies. Skills are delivered in through public and private modalities, including apprenticeships, learnerships, further education and training colleges.
Tanzania	VET – Vocational Education and Training	Public sector provision of vocational education and training is complex, and includes post and training primary training centres, vocational training centres, Folk Development Colleges, technical training centres, and ministry training centres; each of which comes under a different ministry. There are also parastatal training centres, mission trade schools and a growing private sector provision; in fact, most VET training is delivered by church trade schools or private training centres.
Uganda	BTVET – Business, technical and vocational education	Refers to formal education system as well as apprenticeships and non-formal training and vocational system. The BTVET system comprises of three pillars – public, private and firm based education training. Private training service providers outnumber public institutions 4 to 1. An unknown number of apprenticeship and enterprise-based training programmes operate in Uganda. The private sector provides an unknown but significant volume of training of various kinds.

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