

The Integration of Technical and Vocational Education and Training with Sustainable Development Education: A Review of African Case Studies

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Abstract

With the emancipation of the Rio Conference of 1992 and the Johannesburg Conference of 2002, Education for Sustainable Development (ESD) has been regarded as the key component of implementing sustainable development. In particular, the Technical and Vocational Education Training (TVET) for entrepreneurs has been identified as a vehicle for the implementation of education for sustainable development. To assess the effective integration of ESD in TVET, four of the six case studies undertaken by UNESCO in 2009 in Eastern and Southern Africa (i.e., Botswana, Kenya, Malawi, and Mauritius) were reviewed by the author to solicit information as to whether the objectives of ESD have been achieved by the TVET programs. Given that sustainable development is the emerging challenge of the 21st century, the United Nations Educational, Scientific and Cultural Organization (UNESCO) in its Second International Congress held in April, 1999 in Seoul, Republic of South Korea, asserted that Technical and Vocational Education and Training (TVET) programs need to play a pivotal role in developing a new generation of individuals who will face the challenge of achieving sustainable socio-economic development throughout the globe (UNESCO, 1999).

The purpose of this paper is to review 4 of the 6 TVET case studies that were commissioned to the writers connected with UNEVOC Network as part of capacity building and contributing to knowledge building and sharing in Botswana, Kenya, Malawi, Mauritius, and Zambia. Despite the fact that ESD and sustainable development have become household words, the studies reveal that the concept of sustainable development is only vaguely understood. It is very difficult to translate the concept into sustainable educational development. Given the vagueness of educational sustainable development, the researchers were not able develop indicators for assessing its implementation nor to measure the impacts and outcomes of actions taken. It must be concluded that the respondents have little or no understanding of the concept of ESD.

Introduction

In 2002, at the Summit on Sustainable Development held in Johannesburg, South Africa, a special United Nations Decade of Education for Sustainable Development (DESD) under the leadership of UNESCO was established to run from 2005 to 2014. In other words, at the 2002 World Summit, the participants of the summit unanimously agreed that education for sustainability (EDS) be integrated and be made part and parcel of all levels of the TVET programs under the leadership of UNESCO (United Nations, 2002). However, when UNESCO assessed the extent to which the recommendations from the Seoul Congress of 1999 were being implemented by UNESCO member states in reference to the application of TVET for sustainable development, to the dismay of the members, it was found that not much progress had been achieved (Dubois, R. and Balgobin, K. (2010). In Africa in particular, the TVET programs were considered a career path for the less academically advantaged. Some African governments keep dropouts or “lockouts,” students who are unable to move up the educational ladder, not because of poor grades but because of lack of places at the higher level. In addition, the findings established that many African governments don’t have the financial means to finance TVET at a level that can support quality training. For instance, while Ghana spends only about 1 percent of its educational budget on TVET, Ethiopia spends only about 0.5 percent of its education and training budget on TVET (African union, 2007).

To overcome the dismal findings about the TVET programs in Africa, the Bonn Declaration on “Learning for Work, Citizenship and Sustainability” of 2004 quickened the pace and further stressed that education needs to be “... considered the key that can alleviate poverty, promote peace, conserve the environment, improve the quality of life for all and help achieve sustainable development” (UNESCO-UNEVOC, 2004). Therefore, the Bonn Declaration of 2004 said specifically that there should be a reorientation of TVET and suggested that TVET initiatives should be tailored to alleviate poverty but also be made to play a pivotal role in human-centered, sustainable development (UNESCO, 2004).

After years of benign neglect, fresh awareness arose in Africa when policy makers in many African countries became convinced that if reformed TVET could play a major role in the training of a skilled and entrepreneurial workforce that could enable Africa to create wealth and emerge from decadence and poverty (African Union, January 2007). As discussed by Hernes, “far from disappearing from the African educational scene, as some observers were predicting, technical and vocational education is undergoing change and modernization in an effort to better meet the needs of the labour market without sacrificing its social function” (Gudmund Hernes, cited by the African Union, p. 27, 2007).

With this new spirit and energy, the African Union Commission spearheaded the development of a new strategy for the revitalization of the TVET programs in Africa. Using the school-based TVET programs, for example, Cameroon has endeavored to facilitate the integration of TVET with the job market. Lesotho and Rwanda have focused on linking TVET to business. The TVET programs in Malawi are tailoring their TVET programs to emphasize the need to create self-employment based on a foundation of sound general education and also are raising the productivity capacity of the learners in collaboration with industry and prospective employers (African Union, January 2007).

Pursuing the mushrooming of the TVET programs in Africa, six case studies from Southern and Eastern Africa were undertaken to determine the effectiveness of the integration of TVET programs with ESD. From the six case studies the following four case studies were reviewed: 1) A survey of experience and practice in current use for integrating education for sustainable development with TVET in Botswana by Mathews Lebogang Phiri; 2) A study of a current model for integrating education for sustainable development in centers of excellence with TVET in Kenya by John Simiyu; 3) A case study on initiatives in the current use of integrating education for sustainable development with TVET in Malawi by Modesto S. Gomani; and 4) A case study of practices for integrating education for sustainable development with TVET for the tourism industry in Mauritius by Roland Dubois and Koontee Balgobin.

The purpose of this paper is to review these 4 of the 6 TVET case studies that were commissioned to the writers connected with UNEVOC Network as part of capacity building and contributing to knowledge building and sharing in Botswana, Kenya, Malawi, Mauritius, and Zambia. Therefore, the study investigates to determine if the TVET schools in Africa are positioned to train future entrepreneurs to resolve environmentally sustainable development issues. The first section of the paper examines the meaning of sustainable development. The second portion of the study assesses the effectiveness or lack of effectiveness of the TVET programs in delivering the ESD objectives. The final portion of the study addresses possible policy implications. Briefly, the cardinal questions that were used to review the case studies include:

- What does sustainable development entail?
- Do the TVET case studies meet the sustainable development requirements?
- Are the TVET programs in Africa in line with the ESD requirements?
- What lessons can Ethiopia learn from some of the TVET programs in Africa?

Sustainable Development

*“In Africa, we are very good at drawing up strategies and plans
But when it comes to implementation, there is always a difficulty.”*
(A common African saying cited by African Union, 2007, p. 41).

It needs to be stated at the outset that development theories generally originate with the subject. The subject, being the creator of the industrialized world theorizes that by emulating their colonial masters, the non-industrialized countries could raise their standards of living to match their idols (See for example, Richards, 2006). Bearing in mind how development theories are established, it needs to be understood that the concept of sustainable development arose from the concern that zealous pursuit of high incomes and economic growth could cause excessive burden and exploitation of natural resources (Rao, 2009). Thus, linking the concept of sustainability with development has served to strengthen rather than weaken the basic suppositions of economic progress. It has given strength to those whose preference is ‘sustainable economic growth.’ For this reason, the concept of sustainable development is more pronounced in western industrialized

countries than in developing countries because they retain the principle of development, and developed countries are “seen to offer hope for a better share of the world’s wealth” (Smyth, 1995 p. 12).

Therefore, the commonly accepted definition of sustainable development is a development that “meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987). In addition, the United Nations Conference on Environment and Development (UNCED), also known as the “Rio Conference” or the “Earth Summit,” produced a major international document known as the Rio Declaration, Agenda 21, sustainable development to every corner of the world (Mabratu, D. 1998). In addition to linking development and the environment, the goal of sustainable development is that people must share with each other and care for the Earth. Humanity must take no more from nature than nature can replenish. This in turn means adopting lifestyles and development paths that respect and work within nature’s limits. It can be done without rejecting the many benefits that modern technology has brought, provided that technology also works within those limits (*IUCN, UNEP and WWF 1991, p. 8*).

As pointed out by one of the fathers of ecological economics, Daly (1996), “although there is an emerging political consensus desirability of something called sustainable development, this term - touted by many and even institutionalized in some places --is still dangerously vague to be used as a guide for making the desired changes.” Also, one of the protagonists, Tryzna (1995), argues that sustainable development is “an oxymoron,” while Holmberg (1992) reduces the definition of sustainable development to a *cliché*. Esty turns the definition of sustainable development into a buzz-word largely devoid of content (2005).

In addition, as stated by Rauschmayer, et al. (2011), though sustainable development is generally understood as a societal issue related to policy decisions, in Brundtland’s report needs are generally linked to psychological decisions and to decisions made by individuals in their everyday lives. In the Brundtland report, needs are stated in terms of basic material necessities (such as food, water, and shelter), “and are therefore readily associated with the issue of more economic growth and – to a lesser extent – a more equitable distribution of resources in the present and the maintenance of natural capital to secure ecosystem services in the long run” (Rauschmayer, F. et al.(2011). Finally, Rauschmayer, F. et al. argue that making needs a key concept requires a thorough-going conceptual shift in core elements of economic, sociological, philosophical and environmental paradigms as often understood (2011). Thus, according to Gasper (1996), needs have to be operationalized into three types of generic analysis which include: a) a descriptive type of analysis that involves some form of want or desire for basic needs, i.e. subsistence, protection, affection, participation, creation, identity, and freedom (see Max-Neef, et al, 1991, b) instrumental types of analysis that could be understood as requisites for meeting a given end, and c) a capability approach to determine what people do or are able to do in order to create the life that most people are looking for (See A. Sen, 1985).

Will decisions that are economically optimal for current situations or may limit sustainability for the future generation? That is, though the current generation may leave rent or dividends for future generations (i.e., the capacity to be as well off as the current generation) given the current market rates and market fluctuations, dividends accumulated using current resources may not be sustainable for future generations. Contrary to ecologists’ point of view that natural and created capital are fundamentally complementary (used together in production), neo-classical economists like Solow argue that natural resources are substitutable and he states that the obligation to the future is “not to leave the world as we found it in detail, but rather to leave the option or capacity to be as well off as we are” (2000).

Instead of harboring the triple bottom lines, or the triangle of sustainability, such as: 1) economic, the maximizing of income while maintaining a constant or increasing stock of capital, (R. Repetto, 1986); 2) ecological or environmental, the preservation of genetic diversity and sustainable utilization of species and ecosystem (M. Redclift, 1987); and 3) socio-cultural, increasing the standard of living of the poor (E. Barbier, 1987), the concept of sustainability has been used increasingly in policy rhetoric rather than transitioning to actual sustainable development (Rauschmayer, F. et al. 2011).

Due to the participation of major stakeholders, Brundtland’s definition of sustainable development has contributed to a diverse spectrum of definition and interpretation. As stated by

Mabratu (1998) “the effort of interpreting the concept is, to a large extent, influenced by the fundamental tenets of the specific group or organization. This has resulted in a narrow framework of interpretation that does not capture the whole picture.” Therefore, before assessing the African case studies it is worth seeing how UNESCO has defined and applied the concept of sustainable development to meeting the requirements and objectives of education for sustainable development (ESD).

UNESCO’s Definition of Sustainable Development

There is wide agreement that education has an important role to play in motivating and empowering people to participate in the changes towards more sustainable lifestyles. For instance, the Brundtland Report, (WCED 1987) argued that teachers had “a crucial role to play in helping to bring about the extensive social changes” (p.xiv) necessary for sustainable development. Agenda 21, the internationally agreed upon report of the Earth Summit, committed countries to promoting environmental sustainability through education. It states that:

Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues...It is critical for achieving environmental and ethical awareness, values and attitudes, skills and behavior consistent with sustainable development and for effective public participation in decision-making’(See UNSECO, 1992).

According to UNESCO, sustainable development is a culturally-directed search for a dynamic balance in the relationships between social, economic, and cultural systems, a balance that seeks to promote social equity (UNESCO-UNEVO, 2004c. p. 8).

Given that the 21st century is an era of knowledge, information and communication and is signaling the need for a new human-centered development paradigm, as a result, educational policies and programs around the world are taking on board the new vocabulary of sustainable development and acknowledging the need to all sectors of the educational system (See for example, Agyeman et al. 1996). For instance, VET has been seriously considered “...an integral component of lifelong learning and TVET must play 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-UNEVOC, 2004). Therefore the reviews given below attempt to analyze the extent to which the four case studies integrate their Education for Sustainable Development (EDS) with their TVET programs. In particular, the objectives of the case study are to:

1. determine how TVET providers define ESD;
2. assess the relevance of ESD to TVET;
3. determine approaches (delivery methods) used to deliver the integrated ESD/TVET;
4. discover the barriers to ESD/TVET.

Table 1: The Integration of Education for Sustainable Development (SD) to TVET Programs in Four African Countries

Brundtland’s Definition of SD “meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987).				
UNESCO’s Definition of Education for Sustainable Development (ESD): UNESCO’s vision of education is that it “seeks to balance human economic well-being with cultural traditions and respect for the earth’s natural resources (UNESCO, 2005). In short, according to UNESCO, sustainable education is the process of learning about how to make decisions about the long-term future of the economy, ecology, and equity of all communities and about the capacity building for future-oriented thinking.				
	TVET in Botswana	TVET in Kenya	TVET in Malawi	TVET for Tourism in Mauritius
Official Definition of Sustainable Development	1.SD is inclusive of skills for survival and its importance is associated with economic growth and social advancement. 2. SD means ensuring today’s development without compromising the ability of future generations to meet their ownneeds. 4. SD is a purpose-driven activity. 5. SD is meant to equip people with the right skills and knowledge in order to live in a sustainable way, even during a time of unfavorable conditions.	1. Sustainable development concurs with the three pillars of sustainability: environment, society, and economy. 2. International Labour Organization (ILO) defines three aspects of sustainable development: the social, the economic and the environmental. Social aspects include respect for and acceptance of other cultures, taking into consideration distributional equity, adequate provision of social services including health and education, gender equity, establishing a suitable working atmosphere and working within a group.	1.SD means ensuring today’s development without compromising the ability of future generations to meet their ownneeds. 2.Technical, entrepreneurial and vocational education and training (TEVET)is the country’s guide to sustainable development 3. Education is a foundation for sustainable development.	This case study on ESD has come at a timely moment with the Climate Conference (Copenhagen, December, 2009) 1. Sustainable development revolves around a) a balanced economy, b) society, c) the environment, and d) the future. 2. Sustainable development is one of the main ways through which socio-economic development meeting present needs can be achieved without endangering our future.
The objectives of TVET disciplines as component of sustainable development in the curricula	The parameters by which ESD must be understood to extend theidentification of specific skills and knowledge.	The objectives of TVET are for the trainees to: 1. improve access to quality and relevant skills development; 2. prepare people for employment; 3. adjust to changes in the nature of work conditions caused by technological evolution or advances in industrial processes 4. optimize the use of the environment while instilling integrity for present and future generations. 5. providefor and promote lifelong education and training for self-reliance.	1TEVET is to create an adequate and sustainable generation of an internationally competitive skilled workforce capable of spreading the country’s production and export-led-socio-economic growth in a socially responsible manner. 2. In 2004, all public colleges replenished the stocks of their beds, classroom chairsand desks as an outcome of the training process. 3. The main objective of TEVET is to shift the mind-set of people from basing theirlivelihood on exploitative forestry to sustainable forest-based enterprises.	As indicated by UNESCO International Experts Meeting in Bonn in October 2004, there is a need to re-orient TVET curricula to better prepare students and trainees for the conservation and sustainable use of resources, social equity and appropriate development, as well as with competencies to practice sustainable tasks at the workplace.
Data collection methods	A qualitative approach was used for data collection through personal and focus-group interviews.	Purposive sampling was used to select 6/20 TVET institutions that have centers of excellence in Kenya. The participants consisted of 6 principals, 6 heads of departments and 18 instructors.	The study is based on stratified random sampling. While 30 informants were targeted only 24 were involved. In addition to data analysis, focus group and document analysis was performed.	The respondents consisted of: Deans of faculties (5%); Director-managers (14%); Training officers, (52%); University lecturers (29%). Data were collected using a structured questionnaire.

Definition of SD and ESD by respondents to find out the extent of their knowledge about SD	1.ESD means training learners to achieve their desired objectives in terms of career goals, creativity, and market needs. 2. ESD entails conserving natural resources and protecting the environment.	1.Improvement in poverty reduction and , living conditions; 2. Job creation , equipping people and health environment ; 3. Use of resources to meet present and future need.	1. Respondents understood the term “sustainable development” but were not able to express it in a simple term as is found in the literature. 2. Most administrators (67%) defined sustainable development as setting up education systems that are able to provide relevant and marketable courses and trainees to college instructors. 3. Sustainable development can exist and be maintained for a long period of time.	1. Sustainable development is the development of present resources with the view that future generations can also benefit from the resources. 2. SD is keeping a good environment at work while at the same time helping oneself to achieve in one’s career. 3. A holistic approach to development where emphasis is laid on all components, economic, socio-cultural and environmental contributing to economic growth of a country where resources are used in an efficient/optimal way so as to meet the needs of future generations.
The Relevance of ESD in TVET as perceived by training providers	1.The relevance of ESD was found by all respondents to be for the purpose of quality assurance and the development of skills to match economic needs. 2. To be effective ESD needs to be integrated in program and curriculum development. 3.The trainingsystem isdivorced from the actual activities that the country needs for economic growth and employment creation. 4. Graduates lack skills. 5. Subjectsfor entrepreneurs are deemed good examples of education for ESD as they equip learners withbusiness skills.	1.The respondents found the relevance of SD crucial in training for skills development, quality assurance and social and economic development. 2.TVET curricula have the ESD components. 3. There is a lack of awareness among instructors of how to teach it effectively. 4. About 90% of the respondents asserted that sustainable development is relevant to the discipline offered by TVET institutions.	1. TEVET’S Strategic Plan for 2007-2012 mentions sustainability in its mission statement. Thus, sustainability in the skills imparted and the method of approach encourages life-long learning. 2.TVET provides the necessary human resources available for enhanced productivity, both at society and country level. 3.TVET is not an integral part of existing and revised curricula.	Sustainable development is crucial to tourism studies and is fully integrated in them. The name of their faculty is indicative in that it is called the of Sustainable Development and Tourism.
Pedagogy used to Deliver the Methods used to integrate ESD	1. Delivery is mostly through traditional means, i.e. Lectures, seminars and tutorials. 2. The qualifications of trainers and assessors are not satisfactory. 3. Some intuitions send their learners to South Africa for on-the-job-training. 3. Distance learning and educational tours, are used as delivery systems.	1. The teaching approaches used are both theoretical and practical. 2. Trainees are taught the concept of cutting down one tree and replacing it by planting two. 3. Trainees demonstrate role-play exercises, group discussions, presentations reflecting real-life situations, seminars and tutorials. 4. Tree nursery projects are income-generating activities.	1.The following delivery approaches are used in ESD: *lectures *practical lessons *group discussions *industrial or site visits *group demonstration *role modeling	1.All the respondents agreed that whatever ESD elements are perceived to exist in their training provision are being delivered through traditional education, namely through lectures, seminars and tutorials. 2. Other approaches were used to deliver ESD, such as: placement in hotels and travel agencies, participation in educational tours, focus-groups, interviews, distance learning, e-learning, case-studies, talk by professionals, study trips, etc.
Some Barriers Encountered by learners to the implementation or enactment of ESD	1. irrelevance perceived by students; 2. inability of the students to grasp the issues; 3. future career conflicts	1. awkward fit with subject area and confusion over what and how to teach sustainable development; 2. financial restrictions; 3. lack of perception of environmental problems; 5. limited internal accreditationand, institutional commitment.	1. an overcrowded curriculum with too little time to update courses; 2. lack of staff expertise and their need to acquire new knowledge; 3. internal accreditation, validation systems and benchmarks; 4.financial restrictions; 5.instructors who feel ownership and entitlement should be given.	1. financial restrictions; 2. lack of internal accreditation , validation and benchmarks; 3. reality of future careers conflict with sustainability teaching; 4.lack of staff expertise and the need to acquire new knowledge; 5. lack of labor markets for students.

Interviewer’s Conclusion	1.Significant development has taken place to improve access, including the expansion of technical colleges and the setting up of Brigades. But the process is constrained by several factors, including the selection process, institutional structures, staffing, funding, traditional attitudes and perceptions of the work place. 2.Community-based natural resources management programs are at a formulation stage.	1.The findings have uncovered the naked truth that the institutions’ definitions of sustainable development are: a. It is centered on improvements in poverty reduction, living conditions, education, job creation, health and the environment; b. The TVET institutions are making a contribution to the trainee’ awareness of sustainability; c. While there has been some effort to include ESD in teaching and learning in the centers of excellence of TVET institutions, the process appears to be uncoordinated.	1.There is a great misconception about sustainable development among TVET providers. 2. Currently TEVET curricula in Malawi do not explicitly cover sustainable development issues. Students feel that they could be self-reliant at the end of their training if initiatives were included that would sustain these students after training. 3. Sustainable development issues are introduced through best practices in work settings and construction project sites. 4. The construction projects have adopted environmentally friendly methods by using sun-baked bricks instead of fire-baked bricks.	1.A high proportion of the student respondents have identified right attitudes and responsibility towards sustainable development as one of the key factors that graduates need to live and work in a sustainable way. 2. Mostly academics indicated that technical knowledge of sustainability is of prime importance for sustainable development.
Recommendations	The perceptions of students and the relevance of acquired knowledge, skills, and attitudes, need to change to support sustainable development initiatives.	To make ESD more attractive, it is recommended that instructors should receive support in terms of materials, improved knowledge, suitable teaching methods, awareness in terms of joining professional bodies and carrying out research.	1.Curricular review and increased effort to incorporate ESD in all spheres of TVET; 2. Staff should attend capacity-building programs to empower them to deliver curricula effectively by comprehending ESD issues; 3. Establish effective links between the employer’s contribution and demands towards curriculum development and ESD; 4. The study reveals that there is a favorable attitude towards integrating ESD in TVET. However, the effectiveness of this integration will depend on the way barriers are dealt with.	1. Sustainable development should be seen as the third wave of industrialization but dedicated trainers should be chosen to teach ESD, since some respondents mentioned that their future careers might be jeopardized by the teaching of this subject.

Conclusions and Policy Implications

With the emancipation of the Rio Conference of 1992 and the Johannesburg Conference of 2002, Education for Sustainable Development (ESD) has been regarded as the key component of implementing sustainable development. In particular, the Technical and Vocational Education Training (TVET) for entrepreneurs has been identified as a vehicle for the implementation of education for sustainable development. To assess the effective integration of ESD with TVET, four of the six case studies undertaken by UNESCO IN 2009 in Eastern and South Africa (i.e., Botswana, Kenya, Malawi, and Mauritius)were reviewed by the author to solicit information as to whether the objectives of ESD have been achieved by the TVET programs.

Despite the fact the ESD and sustainable development have become household words, the studies reveal that the concept of sustainable development is vaguely understood. It has become very difficult to translate the concept into sustainable educational development. Thus, as unearthed by the investigators, the trainers in the four African countries, Botswana, Kenya, Malawi, Mauritius have little or no understanding of the concept of ESD. Given the vagueness of educational sustainable development, the researchers were not able to develop indicators for assessing the implementation of sustainable development not to measure the impacts and outcomes of actions taken. Most of the respondents referred to ESD as an add-on-subject, as for

example in Malawi, there is a “great misconception about sustainable development among TVET providers (Gamani, 2010).

Despite these problems and the little understanding and training in sustainable development, the managers, lecturers and instructors suggested to the researchers that TVET could be very relevant to the spreading of sustainable education. Students, by and large, claimed that since the subject is nebulous and most of the instructors are semi-trained, their future careers might be jeopardized by adhering to a teacher-centered method of teaching. Instead, the students would have preferred modern integrative pedagogical methods that include learner-centered teaching that would adhere to reflective, experiential and practical-oriented methods. As succinctly stated by Munjanganja (2010), “improving the relevance of TVET programmes to the world of work seems to be behind the efforts to integrate ESD in TVET. ...TVET is hampered by lack of expertise, lack of relevant learning materials, and lack of updated course, among other barriers.” Similarly, Dubois and Balgobin (2010) stated that, “though the concept of ESD was coined some ten years ago at the second UNESCO Congress on TVET in Seoul, it is unfortunate that up to now not much has been achieved regarding its inclusion in TVET, despite an action plan drawn up in 2004....There should be a training-of-trainers programme on how to implement ESD incorporating:

- An agreed definition of sustainable development;
- The contents of sustainable development;
- The methodology to integrate ESD IN TVET;
- A pedagogical approach to the training of ESD;
- Case studies.”

Some policy implications that could be drawn for Africa from the four case studies with TVET programs are: 1) sustainable educational development needs to be enhanced through a strategic framework for the development of national policies; 2) sustainable development needs to be operationalized to include social, economic, environmental factors and meet cultural standards; 3) the current teaching staff needs to be trained and re-trained in pedagogy and current knowledge of ESD so that they can conceptualize sustainable development and apply current pedagogical delivery methods for effective and efficient implementation of ESD in their training centers; 4) the teacher needs to be given further training to prepare the students to have internship while at school and encourage them to be effective entrepreneurs and be involved in productive employment after they graduate; and 5) TVET schools need to be tailored for lifelong learning i.e., on-the-job training, and in worker upgrading and retraining that are vital for human capital investment and self-reliance purposes. Otherwise, having TVET programs as a window dressing mechanism for graduate students with worthless qualifications is unproductive. To overcome the flooding of markets in Africa with all manner of cheap foreign goods and technology, TVET needs to be strategically developed and made competitive, “...as a passport to a well-paid job or self-employment or higher education and not as an alternative educational opportunity fit only for dropouts, the less academically endowed or the poor” (African Union, January 2007).

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