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Integrating Sustainable Development in Technical and Vocational Education and Training

Six Case Studies from Southern and Eastern Africa

UNESCO-UNEVOC CASE STUDIES OF TVET IN SELECTED COUNTRIES

No. 1 Revitalizing a Technical Training Institute in Kenya

No. 2 Integrating Sustainable Development in Technical and Vocational Education and Training

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Table of contents

Introduction	
L. Efison Munjanganja.....	- 4 -
A survey of experiences and practices in current use for integrating education for sustainable development in TVET in Botswana	
Matthews Lebogang Phiri	- 8 -
Case study for integrating education for sustainable development in model youth polytechnics in Kenya	
Joy Kasandi Kelemba.....	- 23 -
A study of a current model for integrating education for sustainable development in centres of excellence in TVET in Kenya	
John Simiyu	- 39 -
A case study on initiatives in the current use of integrating education for sustainable development in TVET in Malawi	
Modesto Sylvester Gomani	- 55 -
A case study of practices for integrating education for sustainable development in TVET for the tourism industry in Mauritius	
Roland Dubois and Koontee Balgobin	- 69 -
A case study of practices in integrating sustainable development in TVET: The case of Mobile Mission Maintenance Vocational Training Centre, Ndola, Zambia	
Gabriel S. Konayuma.....	- 86 -
Acronyms.....	- 102 -
Appendix: data collection instrument.....	- 103 -

INTRODUCTION

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Integrating issues concerning sustainable development, in particular Education for Sustainable Development (ESD), in technical and vocational education and training (TVET) is a subject that has been on the agenda of the UNESCO TVET Programme for over a decade. The Second International Congress on TVE held in Seoul, South Korea in 1999 drew attention to the need to do so by recommending that TVET be re-oriented to sustainable development. Five years later, an international experts meeting held in Bonn, Germany in 2004 highlighted this subject. The Bonn Declaration that was issued at the close of the meeting captured the continuing importance of re-orienting TVET to sustainable development. This can be seen in references in several paragraphs to phrases and clauses such as 'sustainable societies', 'sustainable industries', 'TVET initiatives that alleviate poverty...', and 'TVET initiatives...pivotal to human-centred sustainable development' (UNESCO, 2004a). Going further than the Second International Congress, the International Experts Meeting produced concrete suggestions for action planning, comprising the following:

advocacy and vision building; support for the review and development of national TVET policies; guidelines for planning and implementation; capacity building and training programmes; learning support materials and resources and equipment; networking and partnerships in TVET; and ongoing monitoring, evaluation and research (UNESCO, 2004b).

The Declaration of the UN Decade for Sustainable Development quickened the pace towards addressing practical concerns relating to integrating ESD in TVET. Evidence of this can be gleaned from the report of the actions and activities that were undertaken in various parts of the world, including Eastern and Southern Africa (UNESCO, 2009). Therefore, learning resources and exemplar materials such as tools for curricular development, innovation and assessment, case studies, best practices and success stories became necessary for TVET practitioners, especially vocational education leaders and planners looking for what works as they grapple with questions of integrating ESD in TVET. To move towards satisfying the need, a number of activities, including case studies in Southern and Eastern Africa, were undertaken.

The case studies in Southern and Eastern Africa were commissioned in Botswana, Kenya, Malawi, Mauritius and Zambia. They were carried out by writers connected with the UNEVOC Network as part of capacity building and of contributing to knowledge building and sharing. They have described and have analysed experiences, practices relating to integrating ESD in TVET programmes, primarily. Also, they have identified gaps for additional action so that the integration can be satisfactorily done. Through the case studies it is intended to build a pool of resources and tools of what works as part of the UNESCO-UNEVOC International Centre's clearinghouse. The case studies are, in alphabetical order by country:

- A survey of experiences and practices in current use for integrating education for sustainable development in TVET in Botswana, by Matthews Phiri;
- Case study for Integrating Education for Sustainable Development in Model Youth Polytechnics in Kenya, by Joy Kasandi Kelemba;
- A study of a current model for integrating education for sustainable development in centres of excellence in TVET in Kenya, by John Simiyu;
- A case study of initiatives in the current use for integrating education for sustainable development in TVET in Malawi, by Modesto Sylvester Gomani;
- A case study of practices for integrating education for sustainable development in TVET for the tourism industry in Mauritius, by Roland Dubois and Koontee Balgobin; and
- A case study of practices for integrating education for sustainable development in TVET: the case of Mobile Mission Maintenance Vocational Training Centre, Ndola, Zambia, by Gabriel S. Konayuma.

In spite of the fact that the terms ESD and sustainable development have become almost household names, following several international conferences and regional actions and reports relating to ESD, the case studies reveal that there is little understanding of the concept of ESD among most of the TVET educators who have been the focus of the studies. Definitions and descriptions of the concept 'ESD' and sustainable development are far from comprehensive, ranging from single issues relating to environment, to economic and cultural concerns, with some being closer to the universal conceptions of sustainable development. The conceptions refer to utilizing the earth's resources without jeopardizing future generations. Specifically, the International Experts Meeting adopted the following conception of sustainable development:

...Sustainable development is not a fixed concept; rather it is a culturally-directed search for a dynamic balance in the relationships between social, economic and natural systems, a balance that seeks to promote equity between countries, races, social classes and genders. The interdependence of people and the environment requires that no single development or environmental objective be pursued to the detriment of others. (UNESCO-UNEVOC, 2004c, p.8).

Notwithstanding the limited notion of ESD in some of the case studies, the prevalent view among the writers is that managers, lecturers and instructors is that ESD is relevant in TVET programmes and institutions. It is incorporated in the TVET curricula. Some of the case studies tell of ESD being part of the whole curriculum. Generally, the integration occurs through embedding ESD in TVET courses. The high point in embedding ESD in the institution and programmes is demonstrated by the case study on tourism studies in Mauritius where the word 'sustainable' is included in the name of the School of Tourism. One case seems to suggest that ESD is delivered as an add-on subject, in what is referred to in Mathews Phiri's case study as 'value integration sessions'.

A variety of approaches are employed to impart knowledge about ESD in TVET. Common among the approaches are the following: problem-solving, projects, demonstration, role-playing and role-modelling. Other methods are drama, dance, study tours, industrial placements, and ICT tutorials. In addition, there is wide use of conventional methods such as lectures, seminars and workshops. Of note is the use of what Matthews Phiri calls 'value integration sessions', during which knowledge of ESD is imparted.

The writers highlighted the importance of and need for qualified teachers and instructors. It can be concluded that the extent to which teaching staff uses innovative and learner-centred methods depends on their education and professional qualifications.

Although the integration of ESD in TVET is taking place, there are a number of barriers to doing so. Most common barriers are as follows: misunderstanding of ESD, lack of relevant course materials, lack of time to update courses, lack of staff expertise, lack of institutional drive and commitment, and awkward fit with subject area.

There appears to be an awareness of the importance of incorporating ESD in TVET curricula. Modes used to do so include embedding it in the curriculum and add-on. Improving the relevance of TVET programmes to the world of work seems to be behind the efforts to integrate ESD in TVET. However, success in integrating ESD in TVET is hampered by lack of expertise, lack of relevant learning materials, and lack of updated courses, among other barriers. Some lessons can be learnt from the different case studies. First is the lesson relating to capacity building for teachers and managers in institutions providing TVET. As would be expected, teaching staff that is lowly qualified and deficient in pedagogy and knowledge of ESD could not do a good job. Second, further action to disseminate ESD and to popularise it is needed, especially among managers and teaching staff at TVET institutions. The actions and activities related to the dissemination and popularisation of ESD in TVET would help to increase understanding of the concept, and put it in sharp relief. There are other suggested specific actions that are identified in the case studies. Third, related to popularisation is the need to have ESD written in TVET curricular documents. In cases where policy and curriculum documents are silent about it, there is a tendency not to place importance to it in lessons.

References

- UNESCO. 1999. *Second International Congress on Technical and Vocational Education. Final Report*. Seoul, Republic of Korea, 26-30 April 1999.
- UNESCO. 2009. *World Conference on Education for Sustainable Development. Proceedings*. Bonn, Germany, 31 March-2 April 2009.
- UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training. 2004a. *The Bonn Declaration*. Bonn: UNESCO-UNEVOC.
<www.unevoc.unesco.org/fileadmin/user_upload/pubs/SD_BonnDeclaration_e.pdf>
- UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training. 2004b. *United Nations Decade of Education for Sustainable Development. Suggestions to UNESCO for Action Planning in TVET for Sustainable Development*. [UNESCO International Experts Meeting. Bonn, Germany, 25-28 October 2004.]
- UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training. 2004c. *Orienting Technical and Vocational Education and Training for Sustainable Development. A Discussion Paper*. Bonn: UNESCO-UNEVOC.

**A SURVEY OF EXPERIENCES
AND PRACTICES IN CURRENT USE
FOR INTEGRATING EDUCATION
FOR SUSTAINABLE DEVELOPMENT
IN TVET IN BOTSWANA**

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1 Introduction

Education can be regarded as the principal foundation for any modern society that exists in the world today. Botswana can never hope to achieve sustainable development without education, which is a form of investment in human development that can reduce poverty and enhance the economic well-being of a nation. Education remains a key enabler in a nation's effort to alleviate poverty, disease, hunger, unemployment—to mention but a few perils. The major thrust for education for sustainable development (ESD) includes:

- Improving access to quality basic education;
- Re-orienting existing educational programmes;
- Developing public understanding and awareness;
- Providing training.

TVET can facilitate the transition to a sustainable economy by inculcating sustainable environmental values, and the application of environmentally appropriate knowledge and skills. Sustainable development can increase productivity, competitiveness, employment growth and living standards.

Botswana is one of the countries which signed for the Millennium Development Goals (MDGs). The country later revised its National Development Plan 9 and formulated Vision 2016 as a strategy to align itself with and to achieve the MDGs.

Botswana's economy continues to undergo a rapid transition from a predominantly traditional to a more modern economy in which skill acquisition will be the main vehicle for employment. The commitment of Botswana to sustainable development is evident from its effort to provide education and training for all and to all, and empowering communities by allowing them to operate skill-based schools known as 'brigades'. In addition, Botswana is involved in regional activities such as circles of support, which are aimed at providing assistance to orphans and the needy in society.

1.1 Statement of the problem

Ever since Botswana obtained independence in 1966 poverty reduction and sustainable development have been the cornerstones of government policies and programmes. Nevertheless, questions still arise as to whether any meaningful progress has been made in this regard. Therefore, this study addresses itself to questions of understanding the initiatives and approaches being undertaken by the training institutions in Botswana to integrate education for sustainable development into their TVET programmes.

1.2 Research questions

The research questions will aim to solicit information as to whether the objectives of the study are being addressed. There is a need to establish exactly how ESD is being delivered by institutions and whether it is relevant to the needs of the programme and its intention. There will be an investigation of barriers to enacting ESD and the degree of severity of these barriers as perceived by instructors. There will also be an analysis of exactly what it means to be a well-equipped student who leaves the education system and starts working in a sustainable way.

Specifically, the following research questions guided the study:

1. What approaches are instructors using to integrate ESD into their teaching?
2. What are the barriers being encountered during the integration of ESD into training?

An effort will also be made to gauge what is understood by sustainable development and its relevance to training. An investigation will also be made on the means of ESD delivery.

1.3 Literature review

The United Nations Decade of Education for Sustainable Development (2005–2014) was promulgated at the World Summit on Sustainable Development (Johannesburg, South Africa, 2002) and demanded a central role to be played by TVET as a basis for creating a democratic, human society. It also advocates the need to integrate ESD into all levels of TVET (United Nations, 2002).

There is a need to consolidate international understanding about the relevance of sustainable development within TVET settings and to disseminate strategies for addressing the questions, issues and problems that arise in developing policies and programmes based upon a reorientation of TVET towards sustainable development. These issues and problems come to the fore through reviewing the nature, purpose and scope of development and sustainable development, as well as the relevance of the changing discourse on TVET. In addition, analysing selected case studies of best practices in reorienting TVET for sustainable development highlights issues and problems (Goldney et al., 2007; Mazzotti, Murphy & Kent, 2007).

Furthermore, in a special lecture paper Majumdar (2009) mentioned that sustainable development has evolved in its meanings and purposes. He said there is a common understanding that education and learning cannot ignore the inter-connection between the environmental, social, economic and cultural aspects of sustainable development. Therefore, the parameters by which ESD must be understood have now been extended to the identification of specific skills and knowledge. Some of the relevant generic concepts that underpin the integration of sustainable development into TVET are carrying capacity, eco-space and line, to mention a few.

Valmonte (2005) was of the view that the time to re-orient TVET for ESD has begun. It has been mentioned that TVET for sustainable development calls for co-ordinated and co-operative approaches to ensure a greater and more sustainable impact. In addition, it was mentioned that the success of TVET for sustainable development depends on every individual/organization performing its proper role in a pro-active manner.

1.4 Development of TVET

In Botswana, artisan training started around 1965 and technician training in 1979. At this time, the country was not able to produce all the manpower it required and had to rely on a great deal of foreign expertise to serve its fast-growing economy.

Within the Ministry of Education and Skills Development is the Department of Vocational Education and Training providing professional and financial support to forty-one community vocational schools, referred to as the 'Botswana Brigades'. There are also technical colleges providing training at certificate and diploma level. Through a College of Technical and Vocational Education (CTVE), it also provides pre-service training for lecturers and instructors intending to work in vocational training institutions, as well as being responsible for developing teacher training in this institution. Parallel to the public and community institutions is a small and growing private education and training sector, which was unregulated until 2000. The TVET system has been characterized by disjointed operations with little attention to quality. The government saw the need to set up a co-ordination mechanism to ensure that quality training and relevance served the needs of the economy in the drive for sustainable development.

1.5 Establishment of the Botswana Training Authority (BOTA)

Under the Vocational Training (VT) Act No. 22 of 1998, the Government of Botswana established the Botswana Training Authority (BOTA) to co-ordinate vocational training in the country. BOTA is a parastatal organization, which is mandated to regulate vocational training institutions, vocational training, operate a vocational training fund, as well as to appoint trainers and assessors. BOTA intervenes to ensure that the training delivered is of suitable quality for Botswana in order to provide relevant and quality skills contributing to sustainable development and national economic growth. Regulation is carried out through registration and accreditation of vocational training institutions, as well as of trainers and assessors.

The National Policy on Vocational Education and Training (Republic of Botswana, 1997) mandated BOTA to monitor and evaluate the performance of the vocational training system in order to ensure the successful performance of all training activities and also to advise on policy-related issues concerning vocational training. One of the reasons for supervising the delivery of vocational training is to improve access to quality basic education, to develop public understanding and to raise awareness through career fairs and literature. It is through the engagement of the government, private sector and non-governmental organizations that a common goal of integrating education for sustainable development in vocational training will be achieved. Therefore, the government has made all vocational training the responsibility of BOTA so that it can ensure quality delivery of skills and education for the whole country.

At this point, it is clear that education for sustainable development cuts across the sectors of education in Botswana, including vocational training which has been mandated to BOTA. To ensure that vocational education and training is geared towards ESD, BOTA has set up standard setting taskforces (SSTFs) which develop standards in line with the priority needs of each industry. This is aimed to ensure training that is industry relevant and hence can support growth and development. The SSTFs' members are drawn from the industry concerned by the field of learning in question. BOTA is merely a facilitator in the process.

The use of SSTFs consisting of stakeholders in each identified field of learning in vocational training is important to ensure the relevance of the training to sustainable economic development. Evidently, if training does not meet the needs of industry it would be of no value for the development of the economy. A TVET system without standards will fail to orient trainees towards learning fields that are sustainable and add meaning to their livelihoods. Since they determine the needs of their sector, SSTFs ensure that there is correspondence between skills supply and demand. A TVET system that does not meet the needs of a country's development agenda is counterproductive and cannot contribute to sustainable development.

2 Methodology

2.1 Data collection

A qualitative approach was used for data collection through personal and focus-group interviews. Five institutions were selected from the Gaborone area and a request for a ten-minute interview with each of the institution's personnel (mainly instructors) was requested. Twenty personal interviews were conducted. Focus discussions were preferred by the institutions as they had the advantage of guaranteeing a specified time with a group of the institution's personnel, given the short notice of the request. The interviews actually ran well beyond the requested time, with some taking close to an hour. A total of twenty-six people participated in the group discussions. The study was developed through interactive short interviews/consultations and focus-group discussions averaging three participants. One focus-group discussion in one institution had six participants. The interviewer recorded the key elements of the discussions.

Some use was also made of secondary information. This entailed studies that were undertaken in the past on the vocational training system by BOTA and other authors. The draft report of this case study was sent to two BOTA heads of department to edit, highlight factual inaccuracies and to make comments where applicable. It was important to ensure that the information in the paper was correct. At the same time, care was taken to ensure that the findings remained intact since it would have been unethical to distort the results.

Since there was limited time available, oral interviews were seen to be the most appropriate method to maximize the outcome. This method was most convenient because there was secondary information available that could be used to further write up the case study. Documented information and the use of online information on the subject were employed to gather relevant information about integrating ESD in TVET.

2.2 Data analysis

Analysing the qualitative data about ESD in TVET is essentially a three-part process identifying, collecting and analysing. But when doing quality data analysis (QDA), one does not just identify, collect and analyse such data and then write a report. Rather, the process has the following characteristics:

- Quality data analysis is iterative and progressive because it is a cycle that keeps repeating. For example, when the data are examined, new elements come to light. You then collect and think about these new aspects. In principle the process is an infinite spiral.
- Quality data analysis is recursive because one part draws your attention back to an earlier part. For example, while you are busy identifying data, you might simultaneously start noticing new items that should have been collected.
- Quality data analysis is holographic in that each step in the process contains the entire process. For example, when you first identify data you are already mentally collecting and thinking about them.

3 Findings

3.1 Arts, HIV, AIDS and gender mainstreaming

Issues connected with alleviating the symptoms of HIV and AIDS are very important for sustainable development and this form of education should be fully integrated into the TVET system. Indications from institutions are that through drama and cultural activity there is a growing arts and culture industry in Botswana. BOTA and the Department of Arts and Culture currently run a programme of mainstreaming HIV and AIDS in vocational training institutions (VTIs). One aspect of this programme is carried out through dramatic activities and is a very popular exercise. Drama has been identified as a strong vehicle for mainstreaming and disseminating information on HIV, AIDS and gender mainstreaming issues. All institutions indicated that they taught HIV, AIDS and gender mainstreaming policies. Efforts have been made to develop and implement a HIV and AIDS curriculum for TVET institutions by BOTA, but the impact it is having remains to be established.

An increasing number of people gauge their livelihood through arts and drama activities. Interviewees feel that neglecting these emerging issues would be a disadvantage to society with such talent which they feel is abundant in Botswana and can even be exported.

3.2 Economic development agenda

Economically, Botswana is engaged in many projects, especially concerning the construction industry. A common complaint on the part of contractors is the lack of skilled artisans. Potential investors in the country have also drawn attention to the low level of skills amongst the population. With such a scenario, Botswana's economy could be adversely affected. Indications also show that the informal economy is a growing sector, albeit with very low (17%) levels of training. Women are the most affected as they constitute 60% of the informal sector (Central Statistics Office, 2006). The country has recently launched a Human Resource Development Strategy to address, amongst other matters, the issues of education, training and employment. This strategy is a result of a mismatch between the skills taught and the needs of industry. This is also designed to address the issue of producing graduates with little or irrelevant skills who are unable to earn a livelihood.

The lack of a national qualifications framework (NQF) was highlighted as an issue that has a negative impact on the structuring of education and training to meet national development goals, such as sustainable development. From the perspective of both individual progress and in-service training, the intention to create a complete NQF is a promising initiative in so far as it can ensure better articulation between the existing TVET system and higher education.

TVET certificates currently have limited currency at the University of Botswana. The NQF will be important to determine the levels of education required and to measure the qualifications in terms of their economic value. The success of skills development in Botswana is intimately connected with other developments, such as privatization and economic diversification.

3.3 The definition of ESD

Some respondents in the focus-group discussions indicated that their understanding of ESD meant training learners to achieve their desired objectives in terms of career goals, creativity and market needs. They mentioned the need to offer solid ground for applying learned outcomes and the potential to advance in the education and training system. This could be understood as individual achievement contributing towards national success. In this sense, sustainable development is understood to be a purpose-driven activity. It was also said to concern the teaching and guidance of learners towards income-generating activities and to developing lifelong learning skills. Some respondents also indicated that sustainable development corresponds to a highly motivated institutional culture among school personnel and learners. Sustainable development is regarded as inclusive of skills for survival and its importance is associated with economic growth and social advancement. This was said to entail conserving natural resources and protecting the environment.

Sustainable development is also said to mean ensuring that today's development does not compromise the ability of future generations to meet their own needs. Resources should be used by the current generation with a view to how they will benefit future generations. There should also be a pattern of resource use that aims to fulfil human needs while preserving the environment. Sustainable development involves balancing the fulfilment of human needs with the protection of the environment so that needs can be met not only for the present but also for the indefinite future. Also highlighted is the need for quality in education, as well as institutional staff development to cope with the fast-changing world. Sustainable development can also be a system of continued national socio-economic policies and paradigms to provide sound governance and development.

Sustainable development was also understood to mean equipping people with the right skills and knowledge in order to live in a sustainable way, even during a time of unfavourable conditions. Its focus is on educating individuals for future roles both for the benefit of their own lives and for the community at large. Learning should contribute to the student's future and also to national development. There should be proactive and active achievements that can take one across an ever-growing dynamic occupational world. One should be equipped to face an ever-changing economic and social world.

Respondents observed the evolution of ESD overtime. They feel it must now be understood to go beyond simple environmental conditions to include specific skills and knowledge. It is a process for improving the quality of life by improving the quality of an individual. Environmental education actually also needs to be structured technically and academically as a body of knowledge and skills.

3.4 The relevance of ESD

The relevance of ESD was found to be very important by all respondents for the purposes of quality assurance and developing skills matching economic needs. It was indicated that for ESD to be effective it needs to be integrated in programme and curriculum development. It was said that this is not at present the case in Botswana's TVET system. Respondents felt that the training system is divorced from the actual activities that the country needs for economic growth and employment creation. They cited a situation prevailing in Botswana where there are a lot of TVET graduates from vocational brigades and technical centres, but industry involved in major projects complains about a lack of skills. And consequently, a lot of these graduates are said to be roaming the streets with worthless qualifications. To the respondents, this indicated a lack of understanding or acknowledgement of the need to integrate education for sustainable development on the part of policy-makers. At present, institutions train on the basis of learner preference as is witnessed by the large number of unemployed vocational graduates in information technology. A national skills forecast study was indicated as a necessity to identify those skills that are critical for the economy and have the potential to ensure sustainability for both training and development.

Sustainable development ensures the ability of graduates to perform certain functions relevant to their qualifications and labour-market needs. Integrating sustainable development into TVET is relevant as training will always be matched to changes taking place in the economy. It also supports creativity and innovation as learners discover new ways of doing things. One institution which specializes in secretarial training indicated it

has strong ties with the government in order to align its training with government needs. Some colleges feel the practical programmes they offer are important and relevant for sustainable development. This reduces irrelevance in that training is carried out taking economic growth parameters into account. It is believed that sustainable development can lead to respect and care of the environment by the community, ecological integrity (advocating clean power), social and economic justice, democracy and peace. Entrepreneurial subjects are deemed good examples of education for ESD as they equip learners with business skills. ESD is said to be relevant as it is a human capital investment and no investment is seen to be more important for any nation than its human resources. It is a pillar in human resource development and important for Botswana as it implements its Human Resource Development Strategy.

4 Delivery of ESD in training

4.1 ESD in teaching by traditional means

Most interviewees concurred that the present delivery of training is mainly through traditional means, i.e. lectures, seminars and tutorials. Most institution's facilities were perceived as satisfactory to convey this traditional means of ESD delivery.

The perceptions from the interviewees are that the qualifications of trainers and assessors are not satisfactory. Nevertheless, while some training is carried out by people without qualifications, most trainers are diploma holders. Interviewees felt that the quality of TVET teaching has a direct bearing on sustainable development in that poorly acquired skills cannot be value adding, but rather a burden to the system as further training is probably required. Therefore, in order to contribute to sustainable development, the quality of TVET should be assured. It was also pointed out that those fields of study where unqualified trainers can be found are the construction trades, craft trades and industrial programmes.

This concurs with the National Policy on Vocational Education and Training (NPVET) that for any training or programme to be relevant and value-adding to both the individual and national development goals there has to be quality. A poor quality TVET system will produce poor training products whose training will have no impact on sustainable development. Interviewees felt that the reforms being introduced by BOTA in facilitating standard-setting lead to ownership and relevance of the training by industry. By indicating what their needs are and by being able to set the standards of qualifications that they want from a training graduate, industry will ensure productivity in their supply of goods and services. Therefore, qualified trainers are a vital part of an institution's quality assurance mechanism. Trainers should be able to meet minimum standards for an effective TVET system that satisfies the needs of industry and ultimately the development agenda.

Other approaches include value integration sessions where there are open discussions with learners about possible sustainable livelihood and behavioural changes. There is much use of information and communication technology services, such as Internet and computer-based tutorials. Practical applications are widely conducted by the institutions providing hands-on training. There are also internship programmes in place to deliver ESD. Educational tours are also arranged for learners to places of relevance for their skills training. Distance learning is another mode that is used by some institutions, as well as part-time learning.

4.2 Enrolment of learners (access and equity)

Interviewees indicated that access and equity are very important issues for ESD delivery. ESD integration initiatives that do not relate to these will be meaningless if they cannot be accessed by all citizens, irrespective of their status. Issues of access and equity are still said to be problematic. It was indicated that most learners with disabilities are absorbed by non-governmental organizations (NGOs). A smaller number of learners with disabilities can also be found in brigades and company training centres. A baseline survey on vocational training conducted by BOTA (2006) indicated that at least 293 learners with disabilities constituted 1% of the total vocational training enrolment. Four out of the five institutions interviewed in this study indicated that they have special measures for learners with disabilities in terms of access to buildings, equipment and learning materials. Others actually have an enrolment quota. In order to realize sustainable development for all citizens, access creation and promotion is important. Interviewees are of the opinion that TVET reform is regarded as part of the poverty-reduction strategies of many countries and access is the major starting point. There is, for instance, little access for rural and female learners.

4.3 Industrial attachment

Institutions are making a big effort to increase industrial attachment for learners, but the VTIs still encounter companies that do not appreciate the crucial need for on-the-job training and do not see it as part of their

social responsibility. There is also reluctance by employers to take up learners with disabilities as they consider them as slow and counterproductive. In general, employers regard these attached learners as hindering their production. Some institutions indicated that they send their learners to neighbouring countries for on-the-job training, mainly to South Africa. It was also revealed that employers want to employ these learners for free, i.e. without paying them a living allowance.

4.4 Barriers to enacting ESD

Interviewees were requested to indicate the degree of severity using a selected list of barriers as shown in Table 1, which depicts the total average scores per barrier by all respondents. The respondents were asked to give a score between 1 and 10, with 1 being the most severe barrier and 10 being the least severe barrier.

TABLE 1: Possible barriers for ESD

Possible barriers	Severity of the barrier
Awkward fit with subject area	3
Perceived irrelevance by staff	4
Curriculum too crowded already and lack of time to update courses	3
Internal accreditation, validation systems, benchmarks	4
Requirements of professional associations	5
Lack of staff expertise and the need to acquire new knowledge	5
Perceived irrelevance by students	2
Inability of students to grasp the issues	3
Lack of institutional drive and commitment	4
Lack of staff awareness	4
Financial restrictions	3
Confusion over what needs to be taught	4
Lack of market for students	4
Lack of relevant course examples	4
Reality of future career conflicts with sustainability teaching	3
Lack of perception of big environmental problems	4
Lack of academic rigor/misunderstanding	4
No barriers identified	0

From Table 1 it can be seen that there is little variation in the weighting of the barriers by the interviewees with the lowest rating being 2 and the highest 5. This does show that perceived irrelevance by students is the most important barrier to enacting ESD, followed by inability of the students to grasp the issues and the reality of future career conflicts. Interestingly, the lack of staff expertise is rated as one of the least severe barriers, though it had come to light during the discussions with the trainers that many of their colleagues were unqualified. The least issue of concern arising from the above data pertains to the requirements of professional associations as shown by the high scores (least severity), as well as the lack of staff expertise and the need to acquire new knowledge.

4.5 Students' experiences

The knowledge, skills and attitudes that a student might require to live and work in a sustainable way include:

- Environmental protection;
- Gender sensitivity;
- Sustainable business practices;
- Responsibility;
- Persistence;
- Positive attitudes;
- Develop self-help characteristics;
- Self-reliance;

- HIV/AIDS knowledge and attitude changes;
- Entrepreneurial spirit;
- Self-discipline;
- Continuous learning;
- Computer literacy;
- Innovativeness;
- Accountability.

Lastly, respondents indicated the need for graduates to develop positive attitudes towards changes in development and to keep abreast of economic trends. Skills, such as information technology, have to be embraced by all as an enabler, a driver and a profession. Teamwork was stated by many as a vital need to be inculcated in learners' behaviour. Confidence and the application of learned outcomes were viewed as very important characteristics, but these attributes were seen to be lacking in most graduates.

5 Conclusion

As indicated in the findings, interviewees perceived access as being very important for integrating ESD into TVET. They regard this process as being constrained by several factors, including the selection process, institutional structures, staffing, funding, traditional attitudes and perceptions of the work place. They acknowledge that significant developments have taken place to improve access, including the expansion of technical colleges and the setting up of Brigades. The government takeover of Brigades, which are community-based institutions that offer training with production at trade levels, is aimed at improving the management of these institutions as they were beginning to fall apart. There is a reform movement in education and training involving large number of teachers and lecturers—locally, regionally and abroad. There are also efforts to ensure TVET is of high quality respecting internationally recognized standards through quality assurance bodies, such as BOTA. Policies have been adopted to accommodate these developments.

There has been a move by the VTIs to integrate sustainable development into TVET by imparting such skills and concepts as carrying capacity, community-based natural resource management programmes, economic literacy, sustainable production and consumption, small micro-business skills, and re-use, re-cycle and repair perspectives. But these approaches are still at a formulation stage as mechanisms and logistics for delivering them are still being proposed and need to be further refined.

6 Recommendations

- To create continuity in the system, the country needs to accelerate the establishment of a national qualifications framework ensuring uniformity in qualification and transferability of credit. This would also ensure that TVET programmes are aligned with the education system so that learners may advance smoothly from one level to the next.
- Inclusion of relevant generic concepts which underpin the integration of sustainable development should be carried out as a matter of priority.
- The perceptions of students on the relevance of the acquired knowledge, skills and attitudes need to be changed to support sustainable development initiatives.

References

- Botswana Training Authority—BOTA. 2006. *Learning in the workplace in Botswana, a baseline survey study*. Gaborone: Direct Advertising.
- Central Statistics Office. 2006. *Labour force survey report*. Gaborone: Government Printer.
- Goldney, D. et al. 2007. *Finding the common ground: is there a place for sustainability education in VET?* Adelaide, Australia: National Centre for Vocational Education Research (NCVER).
- Majumdar, S. 2005. *Major challenges in integrating sustainable development in TVET*. Manila: Colombo Plan Staff College. <www.unevoc.unesco.org/up/DG_Paper_-_Prof_S_Majumdar_PhD.pdf>
- Mazzotti, L; Murphy, B; Kent, J. 2007. *Finding the common ground: is there a place for sustainability education in VET? Support document*. Adelaide, Australia: National Centre for Vocational Education Research (NCVER).
- Republic of Botswana. 1997. *National policy on vocational education and training*. Gaborone: Government Printer.
- United Nations. 2002. *Report on the World Summit on Sustainable Development*. New York, NY: United Nations. [A/CONF.199/20]
- Valmonte, L.D. 2005. *Achieving sustainable development through TVET: experiences of international organizations working with member states in Asia and the Pacific*. Bacnotan, Philippines: Don Mariano Marcos Memorial State University. [Paper prepared for the tenth International APEID Conference held in Bangkok, Thailand, from 6 to 8 December 2006.]

CASE STUDY FOR INTEGRATING EDUCATION FOR SUSTAINABLE DEVELOPMENT IN MODEL YOUTH POLYTECHNICS IN KENYA

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Abstract

Youth polytechnics were established in Kenya after a conference organized by the National Council of Churches of Kenya (NCCCK) in 1966 whose theme was: 'After School What?' Currently, the transition rate of pupils from primary to secondary school level stands at 70%; hence, the remaining 30% of primary school graduates and drop-outs from primary and secondary schools provide the catchment for youth polytechnics. Although there are about 817 youth polytechnics spread across the country, which have been mapped by the Ministry of Education, the institutions are yet to operate as centres of choice rather than as centres of 'last resort' (MoE, 2009).

This report seeks to highlight the role being played by model youth polytechnics in the realization of Vision 2030, the Millennium Development Goals (MDGs) and Education for All (EFA). Further, model youth polytechnics are being positioned to increase access, equity, parity and quality education and training as outlined in Sessional Paper 1 (MOEST, 2005).

This case study was undertaken in two model youth polytechnics in Kenya. Individual interviews were held with one manager and three instructors in each institution. The study also involved documentary analysis and non-participant observations.

The researcher sought to gain an insight into initiatives made by youth polytechnics in integrating education for sustainable development (ESD) in training programmes in youth polytechnics. The researcher also examined barriers to the teaching of ESD in youth polytechnics being encountered by managers and instructors.

The results indicated that instructors have not yet understood the meaning of sustainable development, despite the fact that they were aware of the relevance of sustainable development for the socio-economic development of the country. In addition, managers and instructors still used teacher-centred methods when teaching, such as lecturing. However, the managers and some instructors were using learner-centred methods, such as project work, demonstration and problem-solving. While there are several barriers which hinder integration of ESD in TVET, the trainees themselves are not very clear about how to live in a sustainable manner.

1 Introduction

1.1 Background information

During the colonial period, racial segregation in education placed Africans in vocational and agricultural education with the aim of supplying cheap manual labour for the colonial masters (Sorobe, 1992; Sheffield, 1971) as cited in various education reports, including: Fraser, 1902; Phelps Stokes, 1924; and Beecher, 1949. Academic education was reserved for whites and the sons of chiefs who supported the colonial government (Sifuna, 1976; Bogonko, 1992). Subsequently, a commission set up to review the education system in Kenya abolished the racial system of education, removed agriculture from the syllabus and recommended the development of a national curriculum with emphasis on both academic and technical education (Republic of Kenya, 1964). Youth polytechnics, formerly village polytechnics due to their frequency in rural areas, were established in Kenya after a conference organized by the National Council of Churches of Kenya (NCCK) in 1966 whose theme was: 'After School What?'

Although the Gachathi (Republic of Kenya, 1976), MacKay (Republic of Kenya, 1981) and Koech (Republic of Kenya, 1999) reports respectively recommended the development of vocational and technical education, no emphasis was placed on technical training. Consequently, the quality of training deteriorated to the extent that village polytechnics were regarded as inferior institutions reserved for school failures and dropouts. Some of the challenges facing these institutions included: (a) a lack of policy framework for governance and management; (b) poor infrastructure; (c) inadequate and obsolete tools and equipment; (d) a lack of social amenities and recreational facilities; and (e) a varied curriculum lacking quality-assurance mechanisms. Further, there were neither vertical nor horizontal linkages nor collaboration with other educational and training institutions. Therefore, the graduates of village polytechnics possessed inadequate technical and entrepreneurial skills required by the labour market (MOYA, 2006a; Mwinzi & Kelemba, 2009).

Rehabilitation of village polytechnics commenced with the creation of the Ministry of Youth Affairs and Sports (MOYA) in December 2005. Subsequently, the ministry renamed the village polytechnics as youth polytechnics with the dual purpose of countering the negative perception of these institutions by the public and giving them a national outlook as opposed to a local outlook. Since then, there has been a draft sessional paper on youth polytechnics and vocational training centres, which is awaiting approval by parliament. The policy paper addresses all challenges cited earlier, including development of new market-driven and flexible curriculum comprising twelve technical courses and nine general subjects (MOYA, 2006b–n; Republic of Kenya, 2006; MOYAS, 2008).

The government recognizes that the development of technical, industrial, vocational and entrepreneurship training (TIVET) is fundamental in Kenya's efforts to lower levels of poverty and to create opportunities for out-of-school youth. Further, Vision 2030 places great emphasis on science, technology and innovation in general and TIVET in particular as the means for socio-economic and technological transformation. Vision 2030 is the country's new development blueprint covering the period 2008–2030. It aims at making Kenya a globally competitive and prosperous nation with a high quality of life by the year 2030. This policy comprises three pillars: economic, social and political. The social pillar, which is geared towards a just and cohesive society enjoying equitable social development in a healthy and secure environment, outlines issues on education and training.

In its quest for promoting lifelong education and training at artisan level, the Government of Kenya upgraded some youth polytechnics to 'model' status.

A model youth polytechnic is defined in the context of the expected desirable outputs and outcomes. It is conceptualized as a training institution that focuses on:

- Provision of technical and vocational skills training through the TIVET pathway that allows primary school graduates to advance from certificate level to degree level in technically oriented disciplines;
- Promotion of science, appropriate technology and entrepreneurship for the benefit of both youth polytechnic graduates and the community served;
- Provision of harmonized, demand-driven, flexible, competence-based and modular training programmes and opportunities for various groups to enhance their full participation in the community and society, such as life-skills, peer education and support clubs, access to comprehensive health information and services, greening the environment, establishing environmental clubs, the planting of trees, establishing tree nurseries, carrying out other sustainable development programmes, for example, clean-ups, waste management and farming, among others;
- The development of trainees into productive, self-reliant and responsible citizens;
- The provision of training responsive to socio-economic community needs;
- The enhancement of skills for sustainable livelihoods, particularly for vulnerable youth with special needs;
- Promotion of innovative learning systems that include multi-skilling, e-learning, multi-grade and multi-shift (MOYAS, 2009)

1.2 Objectives of the study

The objectives of the study were:

- To undertake a survey on the initiatives being made by the youth polytechnics to integrate ESD in their training;
- To examine the barriers being encountered by youth polytechnic instructors in carrying out their teaching on ESD.

2 Methodology

2.1 Method

A case study design was used to collect data from a sample of two out of five model youth polytechnics. A case study is an inductive approach to carrying out studies. It may allow for a prediction of what may happen in the future in similar circumstances. Two youth polytechnics were purposively selected to represent the diverse characteristics of model youth polytechnics in Kenya (Cozby, 2003; Kelemba, 2005).

The researcher investigated how model youth polytechnics were implementing education for sustainable development (ESD) in their programmes. An initial visit was made to the selected youth polytechnics to establish contact with managers and instructors. In this case study, document analysis, individual structured face-to-face interviews and non-participant observations were carried out by the researcher. Open-ended questions were used in the face-to-face interviews, while a descriptive approach was used to record results. The researcher made follow-up telephone calls where clarification was required on interview data. The researcher also observed the behaviour of managers and instructors in relation to ESD practices as they carried out their normal teaching work. This was done to find out if there was any unity of purpose in the implementation of ESD. A purposive sampling method was used to select instructors from different technical courses (Cozby, 2003; Yin, 1994; Basse, 1999; Flick, 2002; Kelemba, 2005).

In each of the two youth polytechnics, one manager and three instructors selected from different technical courses participated in the face-to-face interviews, giving a total of eight people.

2.2 Data collection

A structured interview protocol was used to collect data from managers and instructors (see annex). The managers and instructors were briefed before and debriefed after the interviews. The researcher gained entrance into youth polytechnics by first of all making a courtesy call on the manager to whom the purpose of study was explained and confidentiality guaranteed. The manager was interviewed then debriefed. The instructors were also briefed about the study, interviewed and debriefed individually. Non-participant observations were made by the researcher before, during and after the face-to-face interviews.

2.3 Data analysis

The research was qualitative in nature and gave the researcher an opportunity to obtain meaning and understanding of experiences, attitudes and feelings towards ESD. The data collected from face-to-face interviews was coded by classifying and collapsing responses in code books. When the need arose to clarify an issue, a follow-up telephone call was made to either a manager or an instructor. The responses on face-to-face interviews were tallied and frequencies worked out. Data were obtained from documents on the background of youth polytechnics in general and specifically model youth polytechnics. Further, the documents provided information on the status of model youth polytechnics. The analysed data were used in writing the case study report. Non-participation observations were listed and classified before being described qualitatively. The analysed data were also used to write the results. The levels of analysis included individual managers and instructors, managers, instructors and the two youth polytechnics.

3 Results

3.1 The definition of sustainable development

Managers and instructors were asked to define the term 'sustainable development'. One manager talked of sustainable development as conservation of the environment, while two instructors talked about preserving the environment for future generations. The remaining five instructors were limited to the idea of tree planting as they associated it with the amount of rainfall falling in an area.

One manager said: 'It is like planting trees'; while another manager stated: 'It is conservation of the environment'. The instructors also gave varying responses to the same question. One instructor said: 'It is keeping the environment clean'; while two other instructors referred to conservation of the environment.

Their definitions were not even close to that of United Nations. Less than half of the instructors mentioned an aspect of conservation in their response. The United Nations definition of sustainable development is 'meeting the needs of the present generation without compromising the ability of future generations to meet their own needs' (United Nations. General Assembly, 1987).

3.2 The relevance of sustainable development within TVET

Instructors and managers were asked to state the relevance of sustainable development in relation to the technical courses of their specialization. In answering this question, the managers and instructors considered their skills in integrating ESD into training programmes.

The knowledge that they cited as relevant included life-skills, guidance and counselling, ethics, integrity and safety measures. They also mentioned attitudes and values such as honesty, cooperation, discipline, sharing and the quest for knowledge. The skills mentioned included observation, identification and classification, analysing, making predictions and drawing conclusions about sustainable development.


They all stated that sustainable development is relevant in each course in the curriculum. Here are some examples of the responses of managers and instructors:

- 'It is relevant because we need to be careful about how we handle or dispose of waste materials. If we do not dispose of metal well, we will pollute the environment'.
- 'When we maintain machines, our environment is safer than when we dispose of machines carelessly'.
- 'When people are taught life-skills and values, they care about other people, their surroundings and how to use natural resources sustainably'.

They were also of the view that sustainable development is a cross-cutting issue which should be incorporated in the curriculum, and in the co-curricular and socio-cultural activities of communities.

FIGURE 1: Application of ESD in a lesson plan

The importance of growing seedlings in enhancing sustainable development



Knowledge
Trainers gain knowledge on the conditions necessary for germination and care of seedlings.

Skills
Trainees gain skills on: land preparation, use of manure, planting, weeding and watering of seedlings.

Attitudes
Trainees develop attitudes on co-operation, the quest for knowledge, sharing and care of seedlings.

Environmental impact
Seedlings release oxygen into the atmosphere, hence they purify air. Animals and plants need oxygen for respiration. People could also be discouraged from burning charcoal which increases carbon dioxide in the atmosphere leading to global warming. The people could be encouraged to use other sources of fuel, like solar energy.

Society
The tree nursery where the seedlings are being growing could be used to teach the community about the role of trees in climate control. Trees are also ornamental and people relax under their shade. The planting of trees especially forests could lead to more rainfall, hence the production of more food.

Economic value
Seedlings are sold to raise income for the trainees and the surrounding community.

3.3 Approaches for integrating ESD into TVET

The managers and instructors cited the following content from the new curriculum as being supportive for the implementation of ESD:

- Materials handling and waste disposal;
- A culture of maintenance;
- Quality control;
- Ethics and integrity;
- Life-skills;
- Guidance and counselling including health issues;
- Safety (MOYA, 2006b–n).

Managers and instructors were asked to describe the methodology used in the teaching of ESD. All of them said that they taught ESD mainly through traditional teaching methods. However, some, especially the two managers and four instructors who had undergone pedagogy training at Kenya Technical Teachers College

(KTTC), said that they use experiential methods, such as problem-solving, case studies, poetry and dance, visual arts, role play, dramatization, demonstration and project work.

One manager said: 'I use both lecture method and project work'; while one instructor said: 'I now use project and demonstration methods since I was taught at KTTC'.

The managers and instructors indicated that they had started implementing projects and programmes related to sustainable development as shown in Table 1.

TABLE 1: Some new sustainable development projects

Society	Economy	Environment
<p>The two model youth polytechnics are involved in activities and programmes that target the neighbouring community. They include:</p> <ul style="list-style-type: none"> • distance and evening learning for members of local society; • peer education and health clubs including access to health information and services, such as guidance and counselling; • voluntary counselling and testing; • use of Internet facilities by community members; • solid-waste management; • clean-ups; • farming; • various clubs; • community sports and drama; and • participation in the board of governors of the institution. <p>Managers and instructors were asked to comment on the availability and use of resources. They said that the ministry had supplied tools, equipment, such as computers, books and other learning materials, such as chalk. One manager said: 'We received teaching and learning materials from the ministry. They are being used well during teaching and also by the community.'</p>	<p>The managers and instructors said that they generated income from; tree nurseries to sell seedlings; sale of timber; solid-waste management; and crop farming in collaboration with communities. They also charged nominal fees for HIV testing at friendly youth empowerment centres where voluntary counselling and testing is carried out, with guidance and counselling. Also cheap Internet services are provided at youth empowerment centres. Other income-generating activities included: bee-keeping; poultry-rearing; motor-vehicle repair; pasture growing; horticulture; furniture-making; television and radio repair; production of beauty and medical substances from the <i>aloe vera</i> plant; electrical wiring; plumbing; weaving; and salon services.</p> <p>Two instructors said: 'We are planting seedlings for sale to raise some money.'</p>	<p>The managers and instructors in the two youth polytechnics indicated that they had contributed to conservation of the environment by:</p> <ul style="list-style-type: none"> • proper waste disposal; • use of solar energy or biogas for cooking instead of firewood, hence reducing air, water and soil pollution; • by planting trees or clean ups, the environment had become healthier reducing respiratory and other environmentally related issues.

3.4 Barriers for integrating ESD in TVET

The data on barriers was collected through face-to-face interviews. The collected data was classified, coded and collapsed.

Managers and instructors were asked to indicate barriers in the implementation of ESD in youth polytechnics. Managers and instructors indicated that said they experienced challenges in implementing ESD in the youth polytechnics. The ranked barriers to teaching ESD in TVET are described below.

The biggest barrier of all is inadequate mastery of sustainable development. After that the most severe challenges included: (a) awkward fit with the subject area; (b) lack of time to update courses; (c) not being given permission to be away from work to attend courses at KTTC enabling them to teach the Form IV level of

education; (d) perceived as irrelevant by students; (e) lack of institutional drive and commitment brought about by differences in remuneration for instructors employed by government and communities; (f) lack of staff expertise; (g) the need to acquire new knowledge due to poverty in communities; (h) confusion over what needs to be taught in ESD as the trainers had not been taught this in college; (i) lack of perception of big environmental problems since most of them reside in rural areas; and (j) the reality of future career conflicting with sustainable teaching as most of them have not yet conceptualized ESD.

One instructor said: 'I have a low level of education and I do not know how to teach issues on sustainable development', while another instructor had this to say: 'The trainees do not understand sustainable development. They say that they have never seen it being done elsewhere. It is also too much work'.

Other barriers which were cited included: (k) lack of academic rigour or misunderstanding due to low educational standards; (l) inability of trainees to grasp issues since the trainers also have low mastery of ESD; (m) lack of benchmarks for emulating good practices in ESD; (n) lack of staff awareness since some instructors have not attended courses in ESD; (o) lack of commitment due to low grants paid to majority of instructors employed by communities; (p) lack of motivation since the government is paying tuition for trainees without increasing remuneration of instructors; (q) low rating of youth polytechnics in the communities as they consider them as institutions for those with low standards of education; (r) lack of collaboration between the instructors employed by the Public Service Commission and those employed by the community; (s) inability to teach the new curriculum due to low skills in sustainable development since they were not taught during initial training.

One manager said: 'The instructors who receive grants are not interested in doing extra work. They complain about low grants paid by the government which make them lose motivation'; while one instructor said: 'I find it hard to teach well due to the low grant. After all, people in this area have a low opinion about youth polytechnics'. The barriers cited by the managers and instructors are within the control of TVET. They include training and community mobilization.

3.5 ESD skills development in TVET

Managers and instructors were asked to state knowledge, skills and attitudes that the trainees needed to live in a sustainable way. Both managers and instructors said that the trainees needed exchange programmes, practical application of ESD, life-skills and collaboration with stakeholders, including parents/guardians. One instructor said: 'The trainees need exchange programmes to enable them see how other people practice sustainable development. Our parents and guardians should also be involved'; while one manager said: 'I think that the trainees should be encouraged to carry out projects on sustainable development at school and at home to be able to practise what is taught in class'. He added that: 'All the same, our compound has become neat since we introduced ESD. It is a good programme. Some trainees are very interested in sustainable development activities in collaboration with local communities'.

The skills needed by the trainees included manipulative skills, and care of plants and animals, such as feeding arrangements. The attitudes needed by the trainees included honesty, integrity, concern for others, cooperation and community mobilization.

3.6 Non-participant observations

Non-participant observations were made as the managers and instructors went about their daily routine. Each youth polytechnics had its vision and mission clearly spelled out and displayed at strategic places in and outside buildings. The visions and missions were aligned to the vision and mission of the Department of Youth Training in the Ministry of Youth Affairs and Sports which states: 'To nurture a dynamic multi-skilled youth adding value to self and society', and the mission which states: 'To empower the youth with appropriate and adequate skills, knowledge and attitudes to realize the full potential for individual and national development' (MOYAS, 2009; MOYAS, 2008).

The vision and mission of the department are aligned with those of the ministry. The vision of the ministry states: 'To be the leader in the region in nurturing empowered and responsible youth and sports persons'. The mission of the ministry states: 'To maximize the full potential of the youth and sports persons through participatory engagements that serve their needs and aspirations for building a better Kenya' (MOYAS, 2009; MOYAS, 2008).

Messages about sustainable development were displayed in several places in the institutions. The compounds of the two model youth polytechnics were very neatly presented. The grass had been trimmed, flower beds weeded and plants labelled. In addition, the containers for waste disposal were clearly marked and properly used. There also seemed to be teamwork in place as the instructors and managers related to each other in a friendly manner.

4 Discussion

The following discussions are based on the results of the case study carried out in the two model youth polytechnics.

The report indicates that the government and development partners are committed to supporting model youth polytechnics in terms of: (a) the training of instructors in pedagogy, management, guidance and counselling; (b) subsidies for tuition for trainees, tools and equipment; and (c) construction of the infrastructure. It is noteworthy that managers and instructors whose capacity has been enhanced through training are implementing ESD in a better way than those who have not received training.

However, the managers and instructors still need further training in pedagogy for effective and efficient implementation of ESD in the training programmes. In addition, there is a need to remove or minimize barriers that hinder effective implementation of ESD. This was noted from responses on the definition of the term and explanation of how implementation of ESD is being carried out. The results support evidence from a literature review. Hence, a lot still needs to be done about improving the status of the youth polytechnics in Kenya. There is a need to carry out more research on how to fast-track development of youth polytechnics.

5 Conclusions

The following conclusions are drawn from the results of the case study.

The managers and instructors do not seem to be very clear about the concept of sustainable development as they gave a variety of meanings to explain the concept. It is therefore not clear how they could effectively implement sustainable development with such limited subject mastery which, furthermore, did not correspond at all to the United Nations' definition.

The managers and instructors unanimously agreed that sustainable development was relevant in their subject areas, despite the fact that they did not have a clear concept about its meaning. They were also able to state the relevant knowledge, skills and attitudes.

The managers and instructors still rely on traditional teacher-centred methods of teaching, such as lecturing. However, some had started using trainee-centred approaches, such as problem-solving and project work. The resources supplied by the ministry, such as personnel, tools, equipment, and teaching/learning materials, were being utilized well by both trainees and community members.

There are several barriers which hinder implementation of ESD at the institutional level. These factors can be categorized as individual, institutional and societal. The managers and instructors felt that trainees needed more exposure, interaction, guidance and counselling, amongst others things, to be able to live and work in a sustainable way.

There is still room to improve sustainable development in model youth polytechnics as the TIVET system provides opportunities for experiential learning. However, the low perception of youth polytechnics by communities still persists and hence there is a need to mobilize the community on the role of youth polytechnics in education and training. There is also a need for networking and collaboration to allow trainees to learn from best practices on sustainable development.

From non-participant observations, there seemed to be an indication that managers and instructors of the two model youth polytechnics were guided by their vision and missions in carrying out programmes and activities. Their visions and missions were tailored to those of the ministry. Besides, the visions and missions were displayed in strategic places in the youth polytechnics.

6 Recommendations

The following recommendations are made on the basis of conclusions drawn from the results of the case study.

These mechanisms need to be put in place to ensure that the concept of sustainable development is grounded amongst managers and instructors through pre-service and in-service training and induction. The trainees will grasp the concept of sustainable development from managers and instructors who already have mastery of this subject. Community sensitization and mobilization also needs to be enhanced.

The concept of sustainable development is relevant to all courses and hence should be emphasized in curricula, co-curricular programmes and service to the community so as to impart the appropriate knowledge, skills and attitudes.

Respondents should be trained in pedagogy for an effective learner-centred teaching and learning process. The managers and instructors need skills, such as guidance and counselling, and life-skills to be able to overcome obstacles to the implementation of ESD.

An effort should be made through training to reduce and remove barriers, such as the lack of relevant knowledge, skills and attitudes among managers and instructors which hinder implementation of ESD, and also to carry out community mobilization.

Communities should be mobilized on the role of youth polytechnics in education, training and industrialization.

The grant paid to instructors employed by communities should be reviewed and improved to enhance harmony between instructors employed by the government and those employed by the community.

More effort needs to be put into the actual practice of ESD on the part of all stakeholders in model youth polytechnics. However, having a clear vision and mission is a boost to the implementation of sustainable development by all stakeholders.

References

- Bassey, M. 1999. *Case study research in educational settings*. Buckingham, UK: Open University Press.
- Bogonko, S.N. 1992. *Reflections on education in East Africa*. Nairobi: Oxford University Press.
- Cozby, P.C. 2004. *Methods in behavioural research*. Maidenhead, UK: McGraw-Hill.
- Flick, U. 2002. *An introduction to qualitative research* (2nd ed.). London: Sage.
- Kelemba, J.K. 2005. *Prevention of early school leaving by girls in urban areas: the case of Buruburu Girls Secondary School, Nairobi, Kenya*. [Masters Thesis, Educational Sciences, University of Groningen, Netherlands.]
- Ministry of Education—MoE. 2009. *Education statistical booklet, 2003–2007*. Nairobi: MoE.
- Ministry of Education, Science and Technology—MOEST. 2005. *Kenya Education Sector Support Programme (KESSP) 2005–2010 (Sessional Paper No. 1, 2005)*. Nairobi: MOEST.
- Ministry of State for Youth Affairs—MOYA. 2006a. *National Policy for the Youth Polytechnics and Vocational Training Sector [NPYP & VTS]*. Nairobi: MOYA.
- Ministry of State for Youth Affairs—MOYA. 2006b. *Modern methods of agriculture levels I and II*. Nairobi: Kenya Institute of Education.
- Ministry of State for Youth Affairs—MOYA. 2006c. *Food processing technology levels I and II*. Nairobi: Kenya Institute of Education.
- Ministry of State for Youth Affairs—MOYA. 2006d. *Electrical and electronics technology levels I and II*. Nairobi: Kenya Institute of Education.
- Ministry of State for Youth Affairs—MOYA. 2006e. *Metal processing technology levels I and II*. Nairobi: Kenya Institute of Education.
- Ministry of State for Youth Affairs—MOYA. 2006f. *Building Technology levels I and II*. Nairobi: Kenya Institute of Education.
- Ministry of State for Youth Affairs—MOYA. 2006g. *Refrigeration and air conditioning technology levels I and II*. Nairobi: Kenya Institute of Education.
- Ministry of State for Youth Affairs—MOYA. 2006h. *Appropriate carpentry and technology levels I and II*. Nairobi: Kenya Institute of Education.
- Ministry of State for Youth Affairs—MOYA. 2006i. *Information communication and technology levels I and II*. Nairobi: Kenya Institute of Education.
- Ministry of State for Youth Affairs—MOYA. 2006j. *Leather work technology levels I and II*. Nairobi: Kenya Institute of Education.
- Ministry of State for Youth Affairs—MOYA. 2006k. *Fashion design and garment making technology levels I and II*. Nairobi: Kenya Institute of Education.
- Ministry of State for Youth Affairs—MOYA. 2006l. *Hair dressing and beauty therapy levels I and II*. Nairobi: Kenya Institute of Education.
- Ministry of State for Youth Affairs—MOYA. 2006m. *Motor Vehicle Technology levels I and II*. Nairobi: Kenya Institute of Education.
- Ministry of State for Youth Affairs—MOYA. 2006n. *General education levels I and II*. Nairobi: Kenya Institute of Education.
- Ministry of Youth Affairs and Sports—MOYAS. 2008. *Strategic plan, department of youth training, 2008–2012*. Nairobi: MOYAS.
- Ministry of Youth Affairs and Sports—MOYAS. 2009. *Service Charter, Department of Youth Training*. Nairobi: MOYAS.
- Mwinzi, D.C.; Kelemba, J.K. 2009. Access and retention of early school leavers in basic technical education in Kenya. In: Zeelen, J. et al., eds. *The burden of educational exclusion*, pp. 241–256. Rotterdam, Netherlands: Sense Publishers.
- Republic of Kenya. 1964. *Education Commission Report*. Nairobi: English Press Limited.
- Republic of Kenya. 1976. *The report of the National Committee on Educational Objectives and Policies*. Nairobi: Government Printers. [The Gachathi Report.]
- Republic of Kenya. 1981. *Second University in Kenya: The Report of the Working Party*. Nairobi: Government Printers. [The Mackay Report.]
- Republic of Kenya. 1999. *Totally Integrated Quality Education and Training (TIQET): Report of the Commission of Inquiry into the Education System of Kenya*. Nairobi: Government Printers. [The Koech Report.]
- Republic of Kenya. 2006. *Training needs assessment and development of TIVET curriculum structures*. Nairobi: Government Printers.
- Sheffield, J.R. 1971. Kenya. In: *The encyclopedia of education*, pp. 294–297. New York, NY: MacMillan & Free Press.
- Sifuna, D.N. 1976. *Vocational education in schools: a historical survey of Kenya and Tanzania*. Nairobi: East Africa Literature Bureau.
- Sorobea, B.N. 1992. *A history of modern education in Kenya (1895–1991)*. Nairobi: Evans Publishers.
- United Nations. General Assembly. 1987. *Report of the World Commission on Environment and Development*. New York, NY: United Nations. (Resolution 42/187, 11 December 1987. The Brundtland Report.)

- United Nations Educational, Scientific and Cultural Organization—UNESCO. 1984. *Terminology of technical and vocational education*. Paris: UNESCO.
- Yin, R. 1994. *Case study research: design and methods* (2nd ed.). Beverly Hills, CA: Sage Publishing.

**A STUDY OF A CURRENT MODEL
FOR INTEGRATING EDUCATION
FOR SUSTAINABLE DEVELOPMENT
IN CENTRES OF EXCELLENCE IN TVET
IN KENYA**

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Abstract

There is a fresh awareness among policy-makers and implementers in many African countries, as well as among the international donor community, about the critical role that education for sustainable development (ESD) can play in technical and vocational education and training (TVET). This report is based on a survey of initiatives in current use for integrating ESD in centres of excellence carried out in six TVET institutions in Kenya. Purposive sampling was used to select six TVET institutions out of twenty centres of excellence for the purpose of establishing the initiatives and approaches that are being used by the instructors in teaching and learning. Data were collected using a structured interview protocol adapted from a report from the Higher Education Academy.

The major findings were that the institutions' definitions of sustainable development are centred on improvements in poverty reduction, living conditions, education, job creation, health and the environment. The definition of ESD depended upon the individual approach to teaching by the instructors, the nature and type of content in their various disciplines and the way each instructor perceived and internalized sustainable development. 'Poverty reduction', 'living conditions', 'education', 'job creation', 'health' and 'environment' are some of the phrases used in defining sustainable development, which seems to concur with the three pillars of sustainability: environment, society and economy. These definitions coincide with common themes or goals appropriate to the scope and goals of TVET identified by the International Implementation Scheme for the United Nations Decade of Education for Sustainable Development and the socio-cultural, environment and economic perspectives of the International Labour Organization. The relevance of ESD to the disciplines offered by TVET institutions is also noted.

The teaching approaches used are both theoretical and practical, such that theory is put into practice; an approach that seems to inspire trainees to think about what they can achieve through their own lives and future careers. The major barriers to enacting ESD in TVET include overcrowding in some parts of the curriculum, the perceived relevance by the staff, limited internal accreditation including institutional commitment and validation systems, financial obligations and confusion over what and how to teach sustainable development.

It is concluded that while there has been some effort to include ESD in teaching and learning in the centres of excellence of TVET institutions, the process appears to be uncoordinated. Overall, the institutions are making a contribution to the trainees' awareness of sustainability. Substantial work is in progress and there is a range of good practices, but it remains not well co-ordinated. Although many of the skills and attributes are difficult to teach, there are a growing number of examples of teaching orientations and approaches that support the development of interdisciplinary thinking, problem-solving and teamwork. Thus, there is evidence of the underlying importance of sustainability as an integral part of these disciplines.

To make ESD more attractive, it is recommended that instructors should receive support in terms of materials, knowledge, suitable teaching methods, awareness in terms of joining professional bodies and carrying out research, among other resources. There is a need for ESD to be taught in a more flexible manner in order that graduates can function in a more complex work environment. Trainees should be made aware of the important role that they (should) play in sustainability. The initiatives and approaches used by the instructors ought to be harnessed and improved upon and documented for sharing with other stakeholders. Further research should be carried out to determine and document the models used in integrating ESD in TVET.

1 Background

Orienting TVET towards sustainable development is a task worthy of significant investment of time, energy and resources. The International Implementation Scheme for the Decade of Education for Sustainable Development (UNESCO, 2005b) states:

There can be few more pressing and critical goals for the future of humankind than to ensure steady improvement in the quality of life for this and future generations, in a way that respects our common heritage – the planet we live on.

There has been a connection between development and economic paradigms primarily focused on the production of goods and services. However, Salim (2002:16), Chair of the World Summit on Sustainable Development, argues that:

There are serious shortcomings in the way development has taken place in the 20th century [...] development has followed only the economic track and has left behind social and environmental sustainability, resulting in rising poverty, inequality in income and development opportunities and natural disasters through rising flood levels affected by sea level rise due to global warming. Development as implemented in the 20th century was not sustainable.

According to the government of Kenya, one of the objectives of TVET is for the trainees to acquire some grounding in the relevant science and technology. This strategy was developed by the Government of Kenya through the Kenya Institute of Education (KIE), a body charged with the development of the education and training curriculum so that trainees are able to understand fundamental principles of the disciplines taught in TVET. It is noted that the trainees should be able to adjust to changes in the nature of conditions of work caused by technological evolution or advances in industrial processes in order to extend the scope of understanding of the industry and society in which they work and live. This, it is hoped, should optimize and humanize the environment and instil integrity for the present and future generations. As such, it is incorporated in the curriculum as a common entity to all trainees.

The overall goal of TVET programme in Kenya is to improve access, quality and relevant skills development (Government of Kenya, 2005a). In its continuous effort to achieve this goal the government organized a symposium in 2003 involving all stakeholders with the objective of reviewing the TVET statutes in Kenya and building a consensus amongst stakeholders on the strategies for the reform process (Government of Kenya, 2005b). Accordingly, one of the major recommendations arising from the symposium was that the government should establish and fund centres of excellence in TVET institutions for:

the purpose of developing new frontiers of knowledge to train specialized human resources and to apply ideas and knowledge in the solutions of problems of society in order to nurture creativity and innovation (p. 23).

TVET in Kenya provides and promotes lifelong education and training for self-reliance. One main challenge facing this sub-sector is inadequate facilities and capacities to cater for those who complete primary and secondary education and wish to undertake TVET (Republic of Kenya, 2005a). New technologies have presented new methods of training prompting staff to be trained and retrained. To this end, the government of Kenya has revisited the centres of excellence established in 2004 to address the challenges.

There are signs on the ground to show that there is a move towards providing skills to mitigate environmental problems. These include major projects to conduct Environmental Impact Assessments by National Environmental Management Authority (NEMA) which would advise on the environment sustainability of the projects. Most construction projects are required to leave indigenous trees where possible. These are usually trees and other plants that are deemed exotic and there is a need to preserve them. It is also encouraged to preserve the natural trees in construction projects as opposed to destroying them with the aim to plant new ones. Cutting one tree and replacing by planting two is a concept that has been internalized by many people

and that since trees take many years to grow to maturity, trees on building sites or built environments should be preserved as much as possible and not to be cleared for the sake of buildings.

The International Award Winner on the Environment, Wangari Maathae, noted for her advocacy for a 'Green Environment' as being crucial in climate change, has contributed a lot to greening the environment and many people in Kenya have been inspired by her spirited efforts to urge people to plant trees in the country in order to reduce drought, which in turn would improve the conditions for planting crops and hence the people's economic livelihoods. It must be noted that sustainable literacy is a basic skill that everyone should possess and a sustainably literate person is expected to understand the need to change to a sustainable way of doing things, individually and collectively. This means not only having sufficient knowledge to decide and act in a way that favours sustainable development, but being able to recognize and reward other people's decisions and actions that favour sustainable development. What is also fresh in people's minds is the government's grappling with the ecosystem, and the issue now is the way forests have been destroyed, especially the Mau forest, to make way for human settlement. The government has now intervened strongly to reverse this trend. 'Greening' the workforce and training system has in turn impacted positively on the economic, social and environmental aspects. Without trees there is no rain and drought follows. People's economic activities end up by being affected.

Kenya is endowed with large tracts of arable soils for planting maize, wheat, coffee, rice tea and virtually all types of cash crops, but without rain drought is inevitable. Thus, environmental protection can only be achieved with due consideration to economic and social development—and never in isolation from each other. There is a symbiotic relationship involving interdependency and interconnectedness between environmental, economic and social development. It is a system. We are challenged by Kofi Annan (2002), the former Secretary-General of the United Nations, to think of two competing visions of the world:

Imagine a future of relentless storms and floods, islands and heavily inhabited coastal regions inundated, rising sea levels, fertile soils rendered barren by drought and the desert's advance, mass migrations of environmental refugees and armed conflicts over water and other precious natural resources.

Then, think again—for [...] a more hopeful picture: of green technologies; liveable cities; energy-efficient homes, transport and industry; and rising standards of living for the entire world's people, not just a fortunate minority.

Laws have been enacted prohibiting people from burning charcoal and collecting firewood in the country aimed at combating deforestation and these have been very helpful in curbing practices of environmental degradation. The growing of food crops on a small scale, such as onions, tomatoes, fruit and bananas has flourished, and people now sell these items for subsistence purposes improving the livelihoods of the majority of Kenyan people. While there are these interventions for environmental conservation and protection, not much has been done in terms of educating people on these issues, especially in the TVET sub-sector. This case study substantiates the results as provided by the respondents.

ESD represents a major shift in the way students are to be taught and learn in TVET institutions. All TVET disciplines in Kenya have a component of sustainable development in the curricula. The challenge is: do the trainees and instructors recognize ESD as an important component in the development of their respective subjects? By inference, what do they teach and how? Although substantial work is in progress, overall, there is a patchy picture of sustainable development being marginal in some disciplines and increasingly higher profile in others. Yet, TVET institutions are going to need ESD in an increasingly complex work environment. In a nutshell, although there seem to be some initiatives being practised to integrate ESD in TVET institutions in Kenya, little information is available and there is no documentation to this effect. According to UNESCO-UNEVOC (2006:27):

Re-orienting TVET towards sustainability will require collaboration and partnership across TVET administration, teachers, researchers and policy-makers of international and non-governmental organizations, business, government, trade unions and youth.

Success in these joint initiatives will require regular monitoring and evaluation based upon clearly defined goals and indicators, such as the percentage of courses in which economic, social and environmental sustainability are integrated and the percentage of graduates who have taken such courses (UNESCO-UNEVOC, 2006). The question is: what initiatives are TVET institutions in Kenya taking to integrate ESD in their teaching and learning?

This study was carried out to determine experiences being gained and practices being applied in the integration of ESD in TVET. The study examines sustainable development initiatives in TVET institutions that are the centres of excellence in Kenya.

1.1 Objectives of the study

The objectives of this study were:

1. To examine the approaches instructors use to integrate ESD in their teaching in TVET institutions that are centres of excellence.
2. To determine the extent to which ESD is being incorporated in the centres of excellence by assessing its relevance in TVET.
3. To identify the barriers and solutions in embedding ESD in teaching and learning in centres of excellence in TVET institutions.

2 Methodology

2.1 Data collection

The study adopted a descriptive research approach using a structured interview protocol. Purposive sampling was used to select six out of a target population of twenty TVET institutions that have centres of excellence in the country. The participants consisted of six principals, six heads of departments and eighteen instructors as shown in Table 1.

TABLE 1: Participants involved in the study

Institution	Principals	Heads of departments	Instructors	Total
A	1	1	3	5
B	1	1	3	5
C	1	1	3	5
D	1	1	3	5
E	1	1	3	5
F	1	1	3	5
Total	6	6	18	30

Four out of the six institutions are within the vicinity of the researcher, making it easily accessible both by phone and by transport. In order to save time, a qualitative approach was used to collect data through personal and focus-group interviews following a structured interview protocol adapted from a report of the Higher Education Academy (Dawe, Jucker & Martin, 2005) as shown in the Appendix at the end of the publication. A thirty-minute one-to-one interview with every principal from each institution, every head of department from each institution and one instructor from each institution (totalling eighteen people) was carried out. The remaining twelve instructors, that is, two from each institution, were subjected to interactive group discussions for focused interviews. Each focus group involved discussions with three instructors from each institution lasting thirty minutes on average. The questions were reformulated if the participants did not understand them in the first instance. Where needed, the actual words said by the participants were jotted down.

Documentation and the use of online information on the subject were employed to gather information about integrating ESD in TVET.

The data collected were used to analyse the approaches and practices people are using to integrate sustainable development in their teaching in centres of excellence within TVET institutions. Barriers to the integration of sustainable development in TVET were also investigated in order to make an inventory of what is lacking or what is required. Specific questions addressed content, course outline and teaching approaches to establish the dominance of sustainable development. The researcher introduced himself to the head of each institution to explain that he was carrying out a study and would like to interview teaching staff regarding the approaches they are using to integrate sustainable development in teaching in the centres of excellence. He made it clear that the information they would give was to be used only for assessing the initiatives and approaches being used and to help produce and document a readily useable resource for the stakeholders.

Data were filed in a note-book and analysed qualitatively; that is, reporting iteratively, progressively, recursively and holographically about interesting things in integrating ESD in TVET. The information is collaborative enough to bring out recommended interventions.

3 Results

3.1 Defining sustainable development

The structured questionnaire required respondents to define sustainable development as a way of finding out the extent of their knowledge about sustainable development. Efforts were made by the informants to define exactly what is meant by sustainable development; the outcome depended on each individual. The responses were analysed to establish how close they were to the definition given by the International Experts' Meeting at UNEVOC (Bonn, Germany, 24 October 2004): 'Culturally directed search for a dynamic balance in the relationships between social, economic and natural systems, a balance that seeks to promote equity between the present and the future, and equity between countries, races, social classes and genders' (UNESCO-UNEVOC, 2005). Furthermore, the definition given by UNESCO (1997) defines sustainable development as: 'Finding approaches that balance economic and social progress, address cultural differences, conform to global, national and local needs and respect ecological values and limits' as the key to sustainable development. In the context of the United Nations Decade of Education for Sustainable Development, UNESCO has used the following definition: 'A vision of education that seeks to balance human economic well-being with cultural traditions and respect for the earth's natural resources' (UNESCO, 2005b).

Some respondents clearly indicated that their understanding of sustainable development meant training to achieve the desired objective of teaching and guiding learners towards income-generating activities (IGA) and the development of lifelong skills for survival. Mention was also made of the need to offer a solid grounding, the application of learned outcomes and potential to advance further in education and training. A number of respondents also said that sustainable development is a culturally directed search for a dynamic balance in the relationships between social, economic and natural systems (environment) and no single development or environmental objective should be pursued to the detriment of any others. A highly motivated institutional culture among personnel and trainees was also mentioned by respondents with some definitions including phrases that are in line with the above-mentioned internationally agreed definitions.

A majority (70%) of the informants defined sustainable development as an improvement in poverty reduction, living conditions, education, job creation, and health or environment, while others defined it in single phrases. The definition of sustainable development from the respondents included the following:

- 'It is improvement in poverty reduction, living conditions, education, job creation, and health or environment'.
- 'Sustainable development is development of the current resources and needs so that the future ones can benefit the future generations'.
- 'Sustainable development is to involve a pattern of use of resources to meet human needs now and for future generations'.
- 'Equipping people with right knowledge, skills and attitude in order to make them live in an unending way in hardship times and conditions'.
- 'Development of quality education and training through quality staff and facilities and equipment to help people cope with the ever-changing technological world'.
- 'A comprehensive approach that encompasses all components (economic, social and environmental aspects) to make resources sustainable'.
- 'The aim of sustainable development is to meet the needs of the present generation and future generation equally'.
- 'Development of the curricula and pedagogy to equip trainees with skills and knowledge to live and work sustainably'.
- 'Encouraging trainees to adopt the concept of cleaner production in their field of specialization with the environmental aspects of sustainable development'.
- 'Equipping trainees with basic vocational skills to prepare them for smooth transition to the labour market and acquainting them with health and safety, problem-solving and how to work with others'.

According to the sampled definitions above, it can be deduced that the respondents have a basic understanding of the meaning of sustainable development. Although the definitions vary, there are phrases that can be deduced as common amongst them, such as reference to resource use for current and future generations. Generally, there seems to be a good understanding of the basic concept of sustainable development.

3.2 Relevance of sustainable development within TVET disciplines

The respondents found the relevance of sustainable development crucial in training for skills development, quality assurance and social and economic development. They indicated that the integration of ESD in TVET can be effective if the components of ESD are clearly embedded in the curricula. Luckily, the TVET curricula already have the ESD components, but there is a lack of awareness among the instructors of how to teach it effectively. 'Greening' the workforce is what remains to be done as it has an impact on environmental, economic and social development. Over 90% of the respondents asserted that sustainable development is relevant to the disciplines offered by TVET institutions. Some 10% had no opinion on this objective, perhaps due to the differences in individual opinion in different disciplines.

3.3 Approaches used to integrate ESD in TVET

All the respondents recognized the fact that sustainable aspects are incorporated in the curricula. The teaching approaches used are both theoretical and practical, such that theory is put into practice or rather theory is applied in practice. Teaching in socio-cultural aspects involves lobbying and advocacy, for example, of gender mainstreaming and also to limit or forestall the destruction of forest habitats by road-builders and extractive industries. In an environmental perspective, ESD provides society with education and knowledge to reduce vulnerability and to provide life-improving self-help strategies. From an economic perspective, learners are enabled to take action to increase public accountability and responsible commercial practices, to multiply energy sources, to introduce recycling and waste reduction, and to promote tree-planting through nurseries whereby seedlings are sold for cash. Instructors teach in the way they understand what ESD means because they conceptualize and internalize the place of ESD in TVET competently. Trainees demonstrate role-play exercises, group discussions and presentations reflecting real-life situations. Seminars and tutorials are also used.

Building trainees taking part in carpentry and joinery courses are shown how trees that have been felled for timber are replaced. The theory is covered in topics such as courses on tree nurseries, and learning about species that flourish locally, forest-type trees and ornamental trees, the season for planting, hardwood/softwood, spacing, etc. Trainees are taught the concept of 'cutting down one tree and replacing it by planting two' and that since trees take many years to grow to maturity, trees on building sites or in a built-up environment should be preserved as much as possible and not be cleared simply to make room for new buildings. More than 50% of the respondents acknowledged the importance of the conservation of trees or forests as soil cover. Existing trees and shrubs give a good indication of what new species are likely to thrive in a particular place as far as climate and soil are concerned. Furthermore, trainees specializing in construction trades recognized that grassed areas and road-side verges possess great amenity value and also perform other useful functions, such as the absorption of sound, the reduction of glare, while providing shade and shelter from winds. The economic value of grassed areas is recognized as they are cheap to establish, but they do still have maintenance costs. Trainees were taught how trees generally have great aesthetic value in form and colour and should be chosen to blend into the environment and landscape in a single composition. Trees change with the seasons giving a living quality to hard surfaces and angular shapes of buildings and roads; compare, for example, their shape in summer and winter. As a practical exercise, trainees tend trees and grass in designated areas on the institution compound, a process they commonly refer to as 'greening', and they make sign boards, such as 'Do not step on grass', and erect them in appropriate areas. Tree nursery projects become an income-generating activity when seedlings are sold. Environmental clubs are organized to engage trainees in community service through innovative sustainability issues at the local level. Road shows are organized to demonstrate some of the trainees' activities.

Vocational trainees in electrical and mechanical trades are similarly taught relevant theory and how it can be applied. Disposal of electronic waste and oil are a major consideration in these areas as far as a clean environment is concerned. Lessons demonstrate that the way of thinking about environmental issues can be changed and it inspires trainees to think about what they can achieve through their own way of life and future careers. Trainees become aware of the environmental management issues available, while instructors in their teaching outline sustainable problems relating to economic and social aspects within the society where they all live.

There is also a demonstrable degree of use of information and communication technologies, such as the Internet and computer-based tutorials that impart skills to a wider audience, as well as industrial attachment for the trainees resulting in employable individuals who are already work trained.

3.4 Barriers to enacting ESD in the training centre

A check-list of barriers to ESD was prepared as shown in Table 2 and was used to collect responses from the participants of each institution regarding the severity of the barriers. A system was used where 1 denoted the least severe problem and 6 the most severe. The sum total of the weight of views from the participants of each institution was made for each alternative and was used to determine the frequencies and percentages. From this, the researcher made conclusions and recommendations.

The respondents were provided with a list of items that could act as potential barriers to the introduction of ESD in TVET and were asked to rank them according to the degree of severity.

TABLE 2: Severity of the barriers to the enactment of ESD in TVET

Possible barriers	Severity of the barrier
Awkward fit with subject area	5
Perceived irrelevance by staff	2
Curriculum too crowded already and lack of time to update courses	3
Internal accreditation, validation systems, benchmarks	3
Requirements of professional associations	3
Lack of staff expertise and the need to acquire new knowledge	2
Perceived irrelevance by students	2
Inability of students to grasp the issues	3
Lack of institutional drive and commitment	2
Lack of staff awareness	2
Financial restrictions	5
Confusion over what needs to be taught	3
Lack of market for students	3
Lack of relevant course examples	3
Reality of future career conflicts with sustainability teaching	5
Lack of perception of big environmental problems	4
Lack of academic rigour/misunderstanding	3
No barriers identified	2

Note: 1 = the least severe problem; 6 = the most severe problem.

From the responses to Table 2, it can be noted that eleven of the barriers are weighted 'average' and 'above average', while six responses are given a value 'below average' with a rank of 2. The most-severe responses are indicated in the Table 3.

TABLE 3: The most-severe barriers to the enactment of ESD in TVET

Most-severe barriers	Severity of the barrier
Awkward fit with subject area	5
Financial restrictions	5

Reality of future career conflicts with sustainability teaching	5
Lack of perception of big environmental problems	4

It appears that the most-severe barriers experienced by the institutions are: (a) awkward fit with the subject areas; (b) financial restrictions; and (c) the reality of future careers. The curricula need to be revisited and remodelled so as to allow for a compatible orientation and smooth connectivity of sustainable development with TVET. This should assist trainees to become confident in inter- and trans-disciplinarity, and in assessing processes and solutions that draw their elements from different disciplines.

Financial restrictions may hamper the process of sustainable development. Hence, ample resources are needed to speed up the process. The government is keen to contribute seed money, including external support from the Constituent Development Fund (CDF), while the rest should be found at the initiative of the trainees and instructors to 'keep the fire burning'. As a matter of fact, the centres of excellence receive funds from income-generating activities that are used within the institutions and for the benefit of the community. Fees are also subsidized from this same source. Efficiency in the utilization of existing resources and evidence of accountability are paramount. When the reality of a future career creates a barrier with sustainability teaching, the curriculum needs to be streamlined to allow for continuity in people's future careers. Lack of perception of big environmental problems appeared to be above average at four points and is a noticeable barrier which should be tackled. The government should take the lead in raising people's awareness.

The other responses ranked 3 as 'severe' are shown in Table 4.

TABLE 4: Severe barriers to the enactment of ESD in TVET

Curriculum too crowded already and lack of time to update courses	3
Internal accreditation, validation systems, benchmarks	3
Requirements of professional associations	3
Inability of students to grasp the issues	3
Confusion over what needs to be taught	3
Lack of market for students	3
Lack of relevant course examples	3
Lack of academic rigour/misunderstanding	3

All of the responses appeared to be on an equal footing in terms of severity and most are within the control of TVET, showing that further reform initiatives in the TVET sub-sector are needed to reduce or eliminate the severity of the barriers. The remainder of the six barriers shown had responses of below average, that is, a value of 2 as in Table 5.

TABLE 5: Less severe barriers to the enactment of ESD in TVET

Perceived irrelevance by staff	2
Lack of staff expertise and the need to acquire new knowledge	2
Perceived irrelevance by students	2
Lack of institutional drive and commitment	2
Lack of staff awareness	2
No barriers identified	2

Although these barriers recorded below average scores, they should still not be neglected as they may have some impact in the way of thinking by institution principals, heads of departments and instructors. Greening the workforce should be embraced in the institutions so that trainees are more responsive and adopt positive attitudes when addressing issues and challenges of sustainability.

Generally, all of these possible barriers should be regarded as impeding the smooth integration of ESD in TVET in Kenya. Thus, it would be appropriate for action to be taken against them by all stakeholders to correct the situation.

3.5 ESD knowledge, skills and attitude development in TVET

Respondents indicated the need for graduates of TVET institutions to develop technical knowledge, skills and attitudes that will require them to live and work in a sustainable way. A sizeable proportion of the respondents identified that the right skills, attitudes and responsibility towards sustainable development and the right balance of practical training and theoretical knowledge would be major factors required of graduates to live and work sustainably. A positive attitude and the application of learned concepts are, thus, crucial. The respondents identified the knowledge, skills and attitudes as shown in Table 6.

TABLE 6: The right knowledge, skills and attitudes towards sustainable development

Experience	Characteristic
<i>Knowledge</i>	To seek solutions in real-life situations
	To develop social and environmental responsibility
	To identify, understand and evaluate values conducive to sustainable development
	To understand different methodologies of the humanities
<i>Skills</i>	Creativity in interdisciplinary teams
	Critical judgement
	Participation in a creative environment
	Transformative learning
<i>Attitudes</i>	To manage change
	To create a stimulating and supportive environment
	Appreciation of the importance of social, environmental and economic contexts
	Self-reflection

All the experiences are generic across TVET specialties. These skills are consonant with those identified from the literature and identified as significant to ESD. The respondents emphasized the need to encourage and involve trainees, from the earliest stages, in 'shaping their world' and to integrate them with personal choices.

Discussion

The traditional initiatives and approaches to integrate ESD in TVET are by seminars, lectures, role models, road shows and workshops. Open discussions are also being practised. The use of information technology, such as the Internet and computer-based tutorials, has also become common and is being viewed as a good delivery method for ESD. The findings suggest that the approaches used are far from adequate to integrate ESD into TVET and a significant impact is yet to be noticed. The findings also suggest that integration of ESD into TVET is being hampered by various factors, such as institutional structures, finance, attitudes and the perception of the workplace.

Workforce training, particularly for instructors, is of paramount importance to ensure that they conceptualize sustainable development, as adduced in the way respondents understood the relevance of ESD in their institutions. Capacity-building is vital. There is an urgent need for the international community to inform TVET systems at country level about policies that support sustainable development. This, for example, would involve educating people in the practices that are known to reverse environmental degradation. A well-articulated and focused TVET policy can lead to huge improvements in education and living conditions. Hence, TVET as an integral component of lifelong learning has a crucial role to play as an effective tool in achieving the objectives of an environmentally sound sustainable development culture.

Furthermore, the International Labour Organization recommendation for TVET defines three aspects of sustainable development: the social, the economic and the environmental. Social aspects are described as 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. As much as TVET prepares people for employment, it must also make them responsible citizens who give due consideration to preserving the integrity of the environment and the welfare of others. New material, therefore, needs to be incorporated into TVET teaching and learning to address this issue.

The economic aspects involve the development of a better understanding of sustainable production and services, and knowledge of ways in which resources can be conserved and waste managed through recycling and reuse.

The environmental aspects focus on how to use resources wisely and minimize waste and pollution, among other matters.

Conclusions

This case study has unearthed the naked truth about the status of ESD in the teaching of TVET in the vocational institutions of Kenya. In general, as defined by the respondents there is a satisfactory understanding of the meaning of sustainable development and what it entails. This study has revealed that Kenya has yet to look at the status of ESD in centres of excellence in TVET institutions. The country needs to embark on programmes that are specific in integrating ESD, particularly in TVET. An initiative such as developing a national qualifications framework is one of the ways forward to closing the gap. It will contribute to a viable curriculum and pedagogy relevant in education and training.

Whilst some effort has been made in the process of embedding sustainable development in teaching and learning in TVET institutions in Kenya, it appears uncoordinated and haphazard. Overall, TVET institutions are making a contribution to awareness about sustainable development. Yet, substantial work is in progress and there is a range of good practice, though not yet well co-ordinated. Although many of the skills and attributes are difficult to teach, there are a growing number of examples of orientations of teaching and approaches that support the development of interdisciplinary thinking, problem-solving and teamwork. The teaching approaches used are both theoretical and practical, whereby theory is applied to real-life situations. There is evidence of an underlying importance for sustainability to be an integral part of all disciplines cutting across the different content taught. There is hope of changing the scenario so as to reach the right path to ESD in TVET.

Recommendations

The government of Kenya should undertake an active campaign among curriculum designers to raise awareness about the importance of sustainable development. While instructors should be supported in terms of acquiring more materials, more knowledge, more training in suitable teaching methods, more awareness in terms of joining professional bodies and carrying out research, among other resources, they should also be made to fully conceptualize and internalize the meaning of ESD in order to make sustainable development more attractive. There is a need for ESD to be taught in more flexible ways in order for the graduates to function in a more complex work environment. To do this requires redesigning the curricula to include some units that promote the skills of critical thinking, fieldwork and the development of the concepts and situations that lead to the adoption of sustainable development. Trainees should be made aware of the important role they (should) play in sustainability. The initiatives and approaches used by the instructors ought to be harnessed and improved upon and documented for sharing with other stakeholders as best practice. Workforce and the training system have to embrace the ESD concept. Models to integrate ESD in TVET, methods of teaching it, and a pool of trainers should be developed in various disciplines for the purpose of knowledge sharing.

References

- Annan, K. (2002). Beyond the horizon. *Time magazine*, 18 August 2002. <www.time.com/time/2002/greencentury/enannan.html>
- Dawe, G.; Jucker, R.; Martin, S. (2005). *Sustainable development in higher education: current practice and future developments*. York, UK: Higher Education Academy.
- Government of Kenya (2005a). *A policy framework for education, training and research*. Nairobi: Government Printer. (Sessional Paper No. 1.)
- Government of Kenya (2005b). *Kenya Education Sector Support Programme 2005-2010: delivering quality education and training to all Kenyans*. Nairobi: Government Printer.
- Salim, E. 2002. *A journey of hope: from Rio to Johannesburg. Words into Action. For the UN World Summit on Sustainable Development, Johannesburg*. London: International Institute for Environment and Development.
- United Nations Educational, Scientific and Cultural Organization—UNESCO (1997). *Educating for a sustainable future*. Paris: UNESCO. (EPD-97/CONF.401/CLD.1.)
- United Nations Educational, Scientific and Cultural Organization—UNESCO (2005a). *Definition of education for sustainable development (ESD)*. Paris: UNESCO.
- United Nations Educational, Scientific and Cultural Organization—UNESCO (2005b). *International implementation scheme for the Decade of Education for Sustainable Development*. UN Decade of Education for Sustainable Development (2005-2014). 171st session of UNESCO Executive Board. Paris
- United Nations Educational, Scientific and Cultural Organization—UNESCO (2009). *Report by the Director-General on the execution of the programme adopted by the General Conference*. Paris: UNESCO.
- UNESCO-UNEVOC (2005). *Final report of the International Experts' Meeting, Bonn, Germany, 24-25 October 2004*. Bonn, Germany: UNEVOC.
- UNESCO-UNEVOC (2006). *Orienting technical and vocational education and training for sustainable development*. Bonn, Germany: UNEVOC.

A CASE STUDY ON INITIATIVES IN THE CURRENT USE OF INTEGRATING EDUCATION FOR SUSTAINABLE DEVELOPMENT IN TVET IN MALAWI

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Executive summary

The importance of post-secondary training in countries like Malawi has become clear with emerging competitiveness in international production markets as well as in job markets. Malawi, as a developing economy, has been striving under the Poverty Reduction Strategy to promote sustainable development using locally available resources. This realization is rooted in the understanding that sustainable development is possible if the economy is able to drive production growth through optimum use of the nation's resources. The availability of skilled manpower in the economy through the existence of well-designed skills-training programmes is one of the important pillars for such development to take place.

As an immediate response to increasing unemployment among Malawians, Malawi enacted the Technical Education, Vocational and Entrepreneurship Training (TEVET) Act in 1999 (Malawi. Government, 1999), which led to the creation of the Technical, Entrepreneurial and Vocational Education and Training Authority (TEVETA), with the sole objective of spearheading reforms in technical and vocational education. In this way, TEVET became part of national human-resources development policy. TEVET policy propagates the need to develop a system that would promote sustainable development, while calling for the need to integrate sustainable development issues even in the approach and delivery of technical and vocational education and training (TVET).

This study describes the experiences Malawi has gone through in its quest to integrate education for sustainable development (ESD) in TEVET. The study looked at the approaches used in the delivery of programmes and also the extent to which ESD has been incorporated and assimilated in curricula and teaching. In short, the guiding principles of the study were to look at the understanding and relevance of ESD among TEVET providers, assessing the extent to which ESD has been integrated in TEVET and how it is being delivered, what barriers hinder effective enactment of ESD and to what extent these barriers are impeding the integration of ESD in TEVET. Finally, the paper looks at ESD skills in TVET.

Key findings

Analysis of the results from the data collected reveals that ESD is a new concept in TEVET. The understanding of most respondents is that sustainable development refers to initiatives that institutions undertake to ensure growth and expansion; or is a kind of positive change that can deliver the expected results over a long period of time. On the other hand, sustainable development has been defined as an activity that continues to self-propagate after initial funding has been exhausted. However, all training providers indicated the need to have sustainable development issues included in the curricula in order to ensure delivery. Currently, TEVET curricula in Malawi do not explicitly cover sustainable development issues. Sustainable development issues are introduced through best practices in workshop settings and construction project sites. The construction projects have adopted environmentally friendly methodologies by using sun-baked instead of fire-baked bricks. In almost all occupational areas the delivery of curricula follows the competence-based education and training (CBTE) approach, which emphasizes training that promotes production of usable products rather than use of models.

There is a wide range of understanding on integration of education for sustainable development among most TEVET providers in Malawi. However, key to the varied understandings are issues of sustainable environmental management, use of sustainable energy sources and the impact of pollution on climate change. The study found that those training areas that are still using traditional approaches have a lesser appreciation of ESD as they focus more on appropriate disposal of wastes. The competence-based training curricula combine both the appropriate disposal of wastes and the development of positive attitudes among trainees on environmental protection issues.

Against a list of ten possible barriers, four came out prominently as substantially obstructing the effective incorporation of ESD in TEVET: These are:

- An overcrowded curriculum with too little time to update courses;
- Lack of staff expertise and the need to acquire new knowledge;
- Internal accreditation, validation systems and benchmarks;
- Financial restrictions.

The key to overcoming these barriers was identified as curriculum review, which would result in ESD occupying a more prominent position. This would necessitate staff training as well as the development of appropriate systems supporting the delivery of ESD.

Considering that TVET is becoming a known pillar of sustainable development, it cannot be separated from ESD. The study revealed that most providers are aware of the need to incorporate ESD as a fundamental subject within TEVET programmes in Malawi. The barriers existing in the process of integrating ESD in TEVET are seen to be surmountable as long as there is commitment and resources at policy and implementation level.

This paper recommends that:

1. While curricula are being reviewed, a deliberate effort should be made to incorporate ESD in all spheres of TEVET;
2. TEVET provider staff should attend capacity-building programmes that would empower them to deliver curricula effectively by comprehending ESD issues;
3. Effective links between employers' contribution and demands towards curriculum development and ESD should be established. This would arise naturally if there was awareness among all users of TEVET graduates.

1 Introduction

1.1 Background

Development and growth in Malawi are guided by the Malawi Growth and Development Strategy (MGDS). This medium-term development strategy spells out that sustainable development is the main pillar contributing towards poverty reduction among Malawians. This is in contrast to past development initiatives that focused on the production of goods and services without taking into consideration sustainability in production processes, and social and environment stability. The result was an increase in poverty, inequality in income and development and natural disasters arising from global warming. Schellnhuber et al. (2004) further argued that our ecological footprint suggests that by following past development initiatives we are not meeting the standards of our immense and unprecedented responsibility for reshaping our planet and its ecosystems. In such a situation, an appeal was being made by the former United Nations Secretary-General, Kofi Annan (United Nations. Secretary-General, 2002).

Let us stop being economically defensive, and start being politically courageous. And let us face an uncomfortable truth: the model of development we are accustomed to has been fruitful for the few, but flawed for the many. A path to prosperity that ravages the environment and leaves a majority of humankind behind in squalor will soon prove to be a dead-end road for everyone.

The emphasis of his call is 'thinking of reversing the environmental degradation'. And the global priority recognizes that environmental protection cannot be achieved without due consideration of sustainable economic and social development. Thus, sustainable development involves interconnections and interdependence between environmental protection and economic and social development.

The MGDS has been comprehensively designed to ensure that development and growth take into consideration the interdependence and interconnections required for sustainable development to take place.

The MGDS identifies several key areas to guide the country towards sustainable development. Technical, entrepreneurial and vocational education and training (TEVET) is among the key areas of focus as a means of creating an enabling environment for private-sector-led growth. The emphasis in the MGDS within this sector is to broaden equitable access to quality TEVET. This forms part of the goals of the TEVET Authority's 2007–2012 Strategic Plan, which in principle inspires the TEVET sector towards creating a situation in Malawi where there is 'an adequate and sustainable generation of internationally competitive skilled workforce capable of spearheading the country's production and export-led socio-economic growth in a socially responsible manner'. Sustainable development is the pinnacle of TEVETA's 2007–2012 Strategic Plan (TEVETA, 2007). As such, objectives under this strategic plan emphasize managing programme implementation for the maximization of impact on sustainable development.

In Malawi (as one of the developing nations) it is inevitable to find a combination of unspecialized/unskilled and skilled labour in most of its development initiatives. The unspecialized labour force basically uses crude production methodologies dependent on natural resources which pose a threat to sustainable development. Substantively, TEVET programmes are tailored to ensure optimum resource utilization both in school and in industry. TEVET programmes in Malawi integrate non-formal and formal training programmes. The non-formal programmes are intensive and practical. Training under these non-formal programmes follows a newly introduced competence-based education and training (CBET) approach. The programme objective is to directly address the skills and development needs of the communities by making a skilled workforce available at that level. This is then ideal for rural empowerment in development activities through job creation and improvement of the rural infrastructure. The programme plays a leading role in opening up access to mass population as it has expansive intake and hence high potential for reducing the training unit cost which is argued to be very high in Malawi (the highest for Africa) (World Bank, 2009). The programmes are never limited in terms of workshop and boarding space. They are environmentally friendly as they ensure that all resources used form part of the intended final products, which are either sold or handed over for use by the community at the end

of training. To ensure that the desired results are achieved, the beneficiaries are provided with a complete toolkit as a targeted input for their training, settlement after training and establishment of income-generating activities (McKeown, 2002). In 2008–2009, a total of 983 trainees benefited from the programme (612 males and 371 females). This is in direct support of the TEVET policy which advocates sustainable and environmentally friendly skills development as enshrined in the MDGs.

On the other hand, the apprenticeship programme is implemented through public and private providers. Training under apprenticeship programmes also follows the CBET approach. The programme also offers an opportunity for upgrading to graduates from the non-formal programmes. As in non-formal programmes, the emphasis in training delivery is making tangible products that after training can easily find a market or can be utilized by the community. Curricula in TEVET are divided into two main blocks of learning modules—occupational modules and fundamental modules which are either industry or institutional based. Fundamental modules are cross-cutting and delivered as stand alone, though the research conducted by TEVETA in 2009 revealed the need for the fundamentals to be integrated and tailor-made to occupational modules. Since 2000 the apprenticeship programme has recruited 4,465 trainees (3,216 males, 1,249 females) (TEVETA, 2009).

Literature on sustainable development indicates that ESD traces its origins from the Earth Summit in Rio de Janeiro in 1992. This was the United Nations Conference on Environment and Development which adopted Agenda 21, The Rio Declaration on Environment and Development. UNESCO was designated as task manager for Chapter 36 of the Agenda, which deals with education, training and public awareness. The task manager identified four overarching goals affecting this chapter: (a) promotion and improvement of the quality of education; (b) reorientation of curricula; (c) raising public awareness on the concept of sustainable development; and (d) training the workforce.

However, the definition of ESD is still not well understood by many, especially in developing countries. In its simplistic form, the Rio Conference defined sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (United Nations, 1987).

A good foundation for understanding the tenets of sustainable development in their entirety is graded on levels of literacy among the population. UNESCO and UNEP argue that education is a foundation for sustainable development and much of the work on ESD must be closely linked to the pursuit of Education for All (EFA) (UNESCO & UNEP, 2005). It is further argued that education is a key instrument for bringing changes in values, behaviour and lifestyles consistent with sustainable development within and among countries. ESD brings the need to address issues of equity in education with regard to gender equality, environmental protection, climate change, biodiversity, rural development, human rights, health care and responsible and sustainable consumption, as these interact within the sustainable development agenda (UNESCO Associated Schools, 2009).

There has been a great deal of effort exercised by different learning institutions on ESD, ranging from small-school projects to huge projects replicated across different localities. More of these projects have been championed under ASPnet good practices. UNESCO's Good Practices on ESD (UNESCO Associated Schools, 2009) presents rich empirical information on integrating sustainable development with education. It argues that good practices have shown that schools today have developed a capacity to initiate, to innovate and to succeed in bringing the concept of sustainability into the forefront of the learning process. This has placed initiatives in the integration of ESD in TEVET on a better footing, considering that current trends in TEVET have seen a shift from traditional approaches to competence-based education and training or outcomes-based approaches in training delivery. Malawi piloted the competence-based training approach from 2003 to 2005. The process involved a rigorous review of the curricula and in 2006 all public and some private colleges embraced the new approach. The new approach ushered in the need to reduce wastage and spillage of training resources as the approach emphasizes making tangible products that can be utilized in people's day-to-day lives.

As an example, in 2004 all public colleges replenished the stock of their beds, classroom chairs and desks using the production of the training process. Since then most school infrastructure projects have also been developed using the same approach—hostels, libraries and classrooms. Some colleges are currently running revolving funds

using money generated through products made through training. This is unlike the traditional approach that trained people using models. The use of models has been proved to be expensive from the point of view of financial resources, natural resources and utilities like electricity. This means that all the resources used in training based on models becomes wasted at the end of training.

Under the Informal Sector Skills Development Programme (ISSDP), TEVETA runs different programmes ranging from one week to six months in duration. The programmes have involved integration of skills development in community-based enterprises. The main objective of such programmes is to shift the mind-set of people from a livelihood based on exploitative forestry to sustainable forest-based enterprises (TEVETA, 2009). Participation of different stakeholders has also been overwhelming in ISSDP and this has necessitated the adoption of different appropriate technologies. One initiative is currently promoting the use of sun-baked bricks which, in principle, has contributed to reducing the cutting down of trees for fuel and gas emissions during the baking of bricks.

1.2 Objectives of the study

This case study attempts to analyse the extent to which ESD is integrated into TVET in Malawi, particularly from the following aspects:

1. To determine how TVET providers define ESD;
2. To assess the relevance of ESD in TVET;
3. To determine methods used to deliver ESD in TVET;
4. To find out barriers to enactment of ESD in TVET.

2 Methodology

2.1 Data collection

The study involved different methodologies of data collection and analyses. The methodology involved a literature review which was conducted on existing training programmes in TEVET, best practices in ESD and TVET and efforts TEVETA is putting in place with regard to integrating sustainable development in TVET. This was supported by a nation-wide study targeting respondents from seven public and four private providers. The study was based on stratified random sampling. While thirty informants were targeted, only twenty-four were involved. A questionnaire adapted from Dawe, Jucker & Martin (2005) was administered to all respondents. The questionnaire had four sections.

- Section A collected personal information;
- Section B collected information on the definition of sustainable development;
- Sections C sought information on the pedagogy used in delivering ESD and possible barriers to enacting it;
- Section D looked at student experience.

Where there was more than one informant from the same institution, group focus discussions were used. This also gave an opportunity to collect more information compared to what could be obtained from the questionnaire. Two research assistants were contracted to collect the information.

2.2 Data analysis

Data analysis was carried out using Microsoft Excel. Tallies were developed for each question item on the questionnaire as this was seen as the best method for analysis since responses for most questions required grouping according to best fit with regard to keywords. Respondents were also divided between administrators and instructors. Each response was given a weight of one and where respondents had given more than one responses to any question, each response counted as one.

Document analysis was also carried out to substantiate the findings from quantitative and focus group discussion data.

3 Results

3.1 The definition of sustainable development

Understanding of sustainable development varies from individual to individual. A questionnaire and focus group discussion were administered in the collection of data. In defining sustainable development, respondents indicated that it refers to initiatives that institutions undertake to ensure growth and expansion. Some indicated that sustainable development is a kind of positive change which can bring expected results over the long term. On the other hand, sustainable development has been defined as an activity that continues to self-propagate after initial funding has been exhausted. Looking at keywords appearing within these definitions, there is a strong indication that respondents understand the term sustainable development but are not able to express it in such simple terms as is found in the literature. This applied both to formal and non-formal programmes. One informant responded using the UN definition: 'Development that should meet the needs of the present generation without compromising the needs of future generations to meet their own' (United Nations, 1987). An effort was made to breakdown respondents between administrators and instructors within private and public institutions. As outlined in Table 1, administrators in public and private institutions (67%) define sustainable development as setting up education systems that are able to produce relevant and marketable courses and trainees in the economy (50% public and 17% private). Some 33% of administrators looked upon sustainability as giving training to beneficiaries in order for them to become self-sufficient after training. As far as instructors in private colleges were concerned, sustainable development was development that can exist and be maintained for a long period of time (67%), while 33% defined sustainable development as giving beneficiaries skills that can lead to them becoming independent.

TABLE 1: Definitions of sustainable development by respondents

Keywords in definitions	Public colleges		Private colleges	
	Administrators	Instructors	Administrators	Instructors
Set up of education system that is able to produce marketable courses and trainees	3		1	
Development that can exist for a longer period				2
Development that should meet the needs of the present without compromising the needs of future generations		1		
To give training beneficiaries skills in order to be self-supported			2	2
Development that can be kept going and maintained		1		2
Initiatives and programmes which an institution undertakes to promote expansion		2		
Positive change which can last for a long time bearing expected results and outcomes		1		
Development initiative that self propagates after initial funding has been exhausted		2		
Maintenance of standards of growth at an institution		2		
Embracing activities which can sustain oneself while reducing dependency		2		

3.2 Relevance of sustainable development in TVET

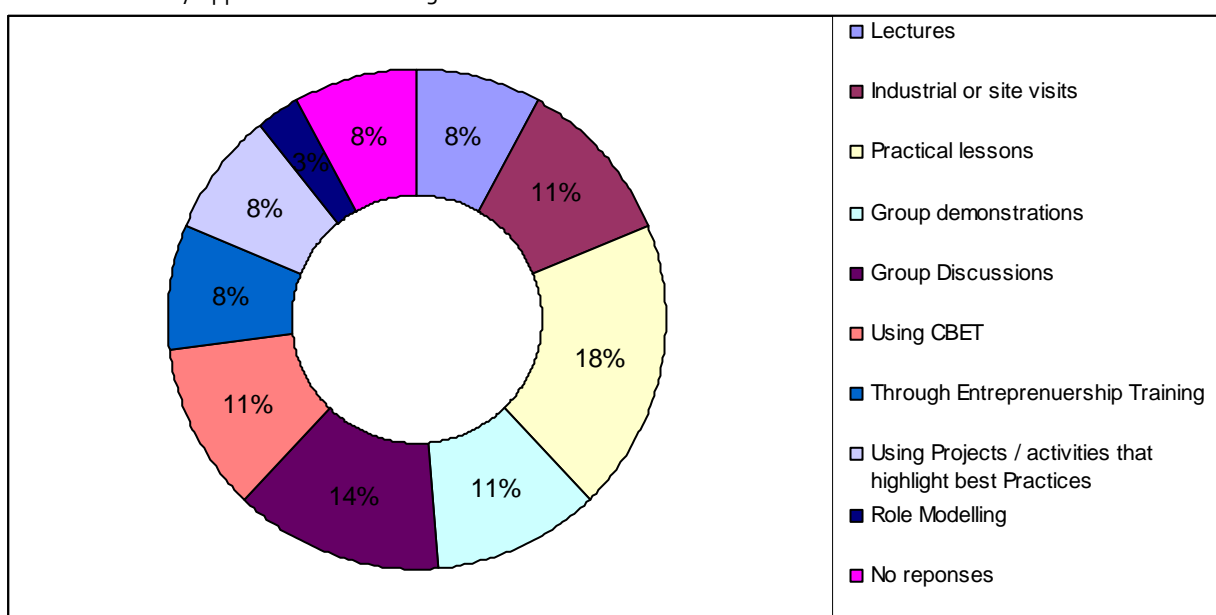
Looking at the relevance of sustainable development in TEVET, the study revealed that apart from delivery of training there is a need to link TVET to development at the individual level as it relates to community

development and later to national economic development. TEVETA's Strategic Plan for 2007–2012 mentions sustainability in its mission statement. Thus, sustainability in the skills imparted and the approach encourages lifelong learning. Responses talk about skills that are both self-sustaining and are able to bring sustainable development to the nation. TVET is able to provide the public and private sector with a skilled workforce. Studies on TVET indicate that the external efficiency of TVET in Malawi is very high, both for wage earning employment as well as self-employment (JIMAT Development Consultants, 2008; Pfeifer & Chiunda, 2008). Significant responses on the relevance of ESD to TVET indicated that TVET made the necessary human resource available for enhanced productivity, both at society and country level. In this regard there is a strong indication that most of the TVET providers appreciated and understood the relevance of ESD in TVET in Malawi. Key issues that came out of responses to a question indicated that relevance of ESD in TVET should be looked at with respect to the following aspects: (a) do the TVET curricula address the social, economic, political and cultural factors of the society? (26%); (b) availability of necessary skilled manpower for improved productivity in public and private sector (43%); (c) colleges becoming self-reliant through the enactment of ESD (4%); and (d) ESD being used as an effective tool for entrepreneurship development (9%). This to some extent agrees with the tenets of sustainable development that looks at society and the economy at the same time. The responses indicated very minimal appreciation of environmental issues. Some 22% of answers were not relevant to the question of relevance of ESD to TVET.

3.3 Approaches for integrating ESD in TVET

Respondents were asked to indicate how ESD is being delivered in their institutions. This question sought to collect information on how ESD is taught in TVET. All informants except three attempted to respond to this question. The results indicate that there is no uniformity in delivery of ESD in Malawi. Document analysis revealed that ESD is still not an integral part of existing and revised curricula. This means that, apart from modules on Occupational Safety and Health, HIV/AIDS and Entrepreneurship, there is nothing directly addressing ESD. The responses on pedagogy and resources indicated nine delivery approaches being used in ESD. Practical lessons (18%), group discussions (14%), industrial or site visits, group demonstration and using CBET (11%) are among the popular approaches used in the delivery of ESD. As indicated in Figure 1, other approaches are entrepreneurship lessons, using projects/activities that highlight best practices, lectures and role modelling. This can mean that while efforts are being made to integrate ESD in TVET at the institutional level, these efforts go unnoticed. This further indicates that the monitoring systems do not focus on ESD.

FIGURE 1: Delivery approaches concerning ESD in TVET in Malawi



3.4 Barriers for integrating ESD in TVET

Respondents were asked to determine the level of severity of a provided list of possible barriers to effective enactment of ESD in TVET. The study results indicated that effective integration of ESD in TVET requires more effort and resources. Out of twenty-three questionnaires received from various training providers, about 75% indicated more than seven parameters that were severe barriers to enacting ESD. The principal barriers are indicated in Table 2.

TABLE 2: Possible barriers to effective enactment of ESD in Malawi

Possible barrier	Number of training providers mentioning this barrier	Severity of barrier
Curriculum too crowded already and lack of time to update courses	16	1
Lack of staff expertise and the need to acquire new knowledge	14	2
Perceived irrelevance by students	17	2
Lack of institutional drive and commitment	14	2
Lack of staff awareness	17	1
Financial restrictions	19	1
Confusion over what needs to be taught	15	1
Lack of relevant course examples	14	1
Reality of future career conflicts with sustainability teaching	12	1
Lack of perception of big environmental problems	12	2
Lack of academic rigour/misunderstanding	18	1

Table 2 shows that lack of academic rigour and financial restrictions are the greatest barriers to enacting ESD in TVET in Malawi, with administrators and instructors in public as well as private institutions indicating that these are the most severe barriers. Administrators' prioritization on financial restriction ranged from 1 to 4, while instructors rated the same within the range of 1 to 2. Lack of staff awareness, an overcrowded curriculum and lack of time to update courses are also among the severe barriers listed. Further, on this same subject, those interviewed in focus group discussions were also asked how they viewed the practicality of introducing ESD in their institutions. Some 40% of training providers viewed sustainable development as a complex issue that can hardly be achieved by the present efforts. They argued that awareness about sustainable development among many players and the context of TVET curricula do not make these issues a core area of study. Inclusion of sustainable development issues in TVET curricula can help address awareness amongst TVET staff and students.

3.5 The knowledge, skills and attitude required by TVET graduates

All respondents were asked to respond to the question on what knowledge, skills and attitudes TVET graduates would require in order to live and to work in a sustainable way. The responses indicated that there is a thin line between knowledge and skills. Administrators looked at a combination of skills and knowledge in life-skills, entrepreneurship, occupation/trade skills, occupational safety and health and communication skills as being essential to ensure that TVET graduates live in a sustainable way. Instructors indicated that graduates needed to have knowledge on information and communication technologies and the conservation of natural resources. Instructors also indicated that graduates could live in a sustainable way if they had skills in business management (marketing and costing) and problem-solving skills. The responses from administrators are more general and obvious in TVET. Document analysis on CBET curricula indicates that entrepreneurship, occupational skills and knowledge, occupational safety and health and communication are already available, including instruction on HIV/AIDS. The CBET curricula further emphasizes the development of knowledge, skill and attitudes. Instructors, on the other hand, have given very specific responses going beyond a classroom situation and articulated issues that concern the environment and society. As supported by responses on attitude, administrators indicated that graduates need to be ambitious and passionate, while instructors indicated that graduates need to feel the ownership and entitlement of assignments and contracts given to them, to appreciate and always to be aware of quality, at the same time as being honest and trustworthy, and always economically informed.

TABLE 3: Knowledge, skills and attitudes required for TVET graduates to live in a sustainable way

Administrators	Instructors
Skills and knowledge	
Life skills	Information, communication and technology skills
Entrepreneurship	Conservation knowledge and skills about natural resources
Occupational skills	Business management (marketing and costing) skills
Occupational safety and health	
Communication skills	
Attitude	
Ambition	Ownership and entitlements
Passion	Quality consciousness and appreciation of quality
	Honesty and integrity
	Economic awareness

4 Discussion

The results reflect that there is a great misconception about sustainable development among TVET providers in Malawi. Most of them looked at sustainable development as simply concerning institutional development. In general terms, the definitions focused on setting up education systems, making students self-reliant at the end of training and including initiatives that would sustain these student after training. This indicates a significant deviance from the UN definition of sustainable development that talks about the present needs not compromising future needs. On another note, it is worth noting that keywords like 'maintenance', 'long-lasting', 'self-supporting' and 'reduced dependence' indicate that there is some crude understanding of sustainable development which needs to be enhanced through appropriate interventions.

However, the study indicates that ESD is relevant to TVET in Malawi as the arguments are in line with the literature. This further shows that both instructors and administrators appreciated the need to integrate ESD in TVET. While this study observed that curricula place little emphasis on ESD, administrators and instructors indicated that the approaches are available for the integration of ESD in TVET. This is an advantage, but employers who are also key stakeholders in TVET should not be left out of the process. The approaches used in Malawi correspond to approaches that have been used elsewhere. The study reveals that there is a favourable attitude towards integrating ESD in TVET. However, the effectiveness of this integration will depend on the way barriers are dealt with.

5 Conclusion and recommendations

Concerted efforts are paramount in order to make ESD a reality. In principle, the TVET curricula needs to be shaped in such a way that ESD become prominent, as promoted by Education for All. As Malawi's TVET sector reform continues and curricula are being updated, stakeholders can take advantage of this situation and incorporate ESD as a fundamental subject in all occupations. A rigorous capacity-building (awareness) of ESD is imperative as trainers seem equally at a loss on ESD issues. Based on the identified barriers, the study recommends key agents and possible remedies as in Table 4:

TABLE 4: Barriers, suggested key agents and possible remedies

Possible barrier	Suggested key agent	Possible remedies
Curriculum too crowded and lack of time to update courses	TEVETA, Malawi Government, employers	Review curricula in TVET
Lack of staff expertise and the need to acquire new knowledge	Malawi Government, UNESCO and TEVETA	Capacity-building for TVET staff
Perceived irrelevance by students	College administrators and instructors	Deliver training based on reviewed curriculum
Lack of institutional drive and commitment	Malawi Government, TEVETA and TVET providers	Capacity-building
Lack of staff awareness	Malawi Government, TEVETA and TVET providers	Conduct capacity-building and awareness meetings
Financial restrictions	UNESCO/donors, Malawi Government and TEVETA	Provide financial resources
Confusion over what needs to be taught	Malawi Government, UNESCO and TEVETA	Conduct capacity-building and awareness meetings
Lack of relevant course examples	Malawi Government, UNESCO and TEVETA	Conduct capacity-building and awareness meetings
Reality of future career conflicts with sustainability teaching	Malawi Government, UNESCO and TEVETA	Conduct capacity-building and awareness meetings
Lack of perception of big environmental problems	Malawi Government, UNESCO and TEVETA	Conduct capacity-building and awareness meetings
Lack of academic rigour/misunderstanding	Malawi Government, UNESCO and TEVETA	Conduct capacity-building and awareness meetings

References

- Dawe, G.; Jucker, R.; Martin, S. 2005. *Sustainable development in higher education: current practice and future developments*. York, UK: Higher Education Academy.
- JIMAT Development Consultants. 2008. *Malawi labour market survey*. Lilongwe: TEVETA Secretariat.
- McKeown, R. 2002. *Education for sustainable development toolkit*. <www.esdtoolkit.org/esd_toolkit_v2.pdf>
- Malawi. Government. 1999. *TEVET Act*. Zomba, Malawi: Government Press.
- Pfeiffer, D.; Chiunda, G. 2008. *Tracer study of TEVET and higher education completers in Malawi: final report*. Lilongwe: GTZ/World Bank.
- Schellnhuber, H.J. et al. 2004. *Global change and the earth system: a planet under pressure*. Heidelberg, Germany: Springer (IGBP Series).
- Technical, Entrepreneurial and Vocational Education and Training Authority—TEVETA. 2007. *TEVETA 2007–2012 Strategic Plan*. Lilongwe: TEVETA. [Unpublished.]
- Technical, Entrepreneurial and Vocational Education and Training Authority—TEVETA. 2009. *Annual report*. Lilongwe: TEVETA. [Unpublished.]
- United Nations. 1987. *Our Common Future: report of the World Commission on Environment and Development (WCED)*. Oxford, UK: Oxford University Press.
- United Nations. 1992. *Agenda 21: The Rio Declaration on Environment and Development, Chapter 36*. New York, NY: United Nations.
- United Nations. Secretary-General. 2002. *Address to the World Summit on Sustainable Development Johannesburg, South Africa, 26 August–4 September 2002*. (A/CONF.199/20.)
- United Nations Educational, Scientific and Cultural Organization—UNESCO; United Nations Environment Programme—UNEP. 2005. *First Expert Meeting for United Nations Decade of Education for Sustainable Development in Africa*. Nairobi, Kenya: UNESCO/UNEP. <portal.unesco.org/education/en>
- UNESCO Associated Schools. 2009. *Education for sustainable development: second collection of good practices*. Paris: UNESCO.
- UNESCO-UNEVOC. 2008. *UNESCO-UNEVOC in action: Report on Activities 2006–2007*. Bonn, Germany: UNEVOC. <www.unevoc.unesco.org/wiki.html>
- UNESCO-UNEVOC. 2009. *Case study on ESD in TVET from Malawi*. Bonn, Germany: UNEVOC.
- World Bank. 2009. *The education system in Malawi: country status report*. Washington, DC: World Bank. (CSR 2008/2009.)

**A CASE STUDY OF PRACTICES
FOR INTEGRATING EDUCATION
FOR SUSTAINABLE DEVELOPMENT
IN TVET FOR THE TOURISM INDUSTRY
IN MAURITIUS**

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Acknowledgements

This case study on ESD has come at a timely moment given the run up to the Climate Conference (Copenhagen, December 2009). UNESCO-UNEVOC must be congratulated for having decided to produce this series of case study aimed at arriving at a model of ESD that could eventually be integrated into all TVET programmes. Indeed, the idea had already been mooted at the second UNESCO International Congress on TVET (Seoul, 1999). Unfortunately, not many actions have been implemented so far in spite of an action plan that was developed in 2004 at an Expert Meeting in Bonn.

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Executive summary

Given that tourism is earmarked to become the first pillar of the Mauritian economy by the year 2015, tourism studies have become very popular and are being offered by the École Hôtelière Sir Gaëtan Duval of the Industrial and Vocational Training Board (IVTB), the leading TVET organization in Mauritius, and as well as at the University of Mauritius, the University of Technology Mauritius and some private training centres.

At the second UNESCO International Congress on TVET held in Seoul in 1999, TVET was given an orientation to incorporate sustainable development. At about the same time, Mauritius became aware of the need to protect its milieu and was one of the first countries to sign the Kyoto Protocol, followed by a series of measures to protect its environment. Furthermore, a 'Building a Green Mauritius' Project was announced in the budget speech of 2008/2009, while pressure is building up everywhere to sensitize the global population about climate change. The IVTB, the two universities in Mauritius, as well as the private institutions providing training in tourism studies, are conscious of this uncomfortable truth and strongly believe that it is only an educated population with a sound awareness of the issues that can understand the importance of sustainable development and help translate all the measures announced into real projects, thereby contributing to making Mauritius into an economically, socially and environmentally developed country.

It was therefore appropriate to find out how education for sustainable development (ESD) is being handled, if at all, in these different institutions. Thus, the purpose of the case study was to find out the status of ESD in selected training institutions in Mauritius. The sample consisted of training officers from the IVTB, private training providers and university lecturers involved in the teaching of tourism studies. Data were collected using a structured questionnaire outlining an understanding of sustainable development, the initiatives adopted and the possible barriers that could prevent the inclusion of ESD in training programmes.

Data analysis showed that sustainable development revolves around five important elements: process, a balanced economy, society, the environment and the future. This first analysis indicated that the population has a rather good understanding of sustainable development, which is being delivered through traditional educational means, as well as through other approaches, such as focus-group interviews, distance learning and e-learning, amongst others. Most of the respondents indicated that the most severe barriers are *financial restrictions* and *perceived irrelevance by students*. After a detailed analysis of the data, it was concluded that an action plan for a national TVET sustainability policy should be produced and some recommendations were made for its implementation.

1 Background

Tourism is earmarked to become the first economic pillar of Mauritius since the government is targeting to welcome 2 million tourists annually by the year 2015, representing a regular yearly increase of 10%. The tourism sector contributed 9% to the Mauritian gross domestic product (GDP) in 2008, providing direct employment for 25,000 people and indirect employment for a further 50,000. This massive growth of the tourism sector has led to some serious debates in Mauritius as to the number of people the economy of Mauritius was capable of supporting, since it is already sustaining a population of over 1.2 million for an area of 2,000km² or a population density of 600 persons per km². The debates are centred around the three main pillars of responsible and sustainable development, namely, the economic, the social and the environmental impact.

A key question of interest is whether the image of Mauritius as a high-class tourist destination can be sustained. The Mauritian Government is very conscious of the consequences of that policy, its impact on the economy, the negative effects on society and its implications on direct and indirect employment in the tourism sector. As a result, a series of measures has been initiated to protect the environment over the years and the 'Building a Green Mauritius' Project was announced in the budget speech of 2008/2009. Responsibility for this project was attributed to the Office of the Deputy Prime Minister in an effort to send a strong signal to the population.

On the international scene, people are becoming very conscious of the adverse effects of climate change on our environment. People from over 170 countries participated with their banners in peaceful demonstrations in the last weekend of November 2009 prior to the Copenhagen Conference on Climate Change held in December 2009 in the context of the Kyoto Treaty which would be expiring in 2012.

At the UNESCO Second International Congress on Technical and Vocational Education and Training (TVET) held in Seoul, Republic of Korea, in April 1999, Colin Power, the then UNESCO Deputy Director-General for Education, mentioned in his closing address that:

TVET can play an instrumental role in developing a new generation of individuals who will face the challenge of achieving sustainable socio-economic development. A number of new subjects (issues) therefore need to be incorporated into TVET teaching and learning or be further emphasized for the sake of the future of all of us as we struggle to learn throughout life (Power, 1999).

It is no coincidence that the central theme of the congress was 'Lifelong Learning and Training for All: a Bridge to the Future'. In the preamble to the recommendation contained in the Final Report of that same conference, it was clearly stated that:

We have considered the emerging challenges of the 21st century, a century that will be an era of knowledge, information and communication. Globalization and the revolution in ICT have signalled the need for a new human-centred development paradigm. We have concluded that TVET, as an integral component of lifelong learning, has a crucial role to play in this new era as an effective tool to realise the objectives of a culture of peace, environmentally sound sustainable development, social cohesion, and international citizenship (UNESCO, 1999).

At the World Summit on Sustainable Development (Johannesburg, 2002), a special United Nations Decade of Education for Sustainable Development (DESD) was established running from 2005 to 2014. Its primary goal was to make sustainable development central by refining and promoting the transition to a sustainable future through all forms of education, public awareness and training. UNESCO was designated as the lead UN agency for the Decade and has catalyzed key initiatives in all parts of the world.

In October 2004, UNESCO hosted an International Experts' Meeting on 'Learning for Work, Citizenship and Sustainability' in Bonn, Germany. The participants made an assessment of the extent to which the recommendations from the Seoul Congress were being implemented by UNESCO Member States with particular

reference to: (a) learning for skills development; (b) the transition to the world of work; and (c) TVET for sustainable development. It was noted, however, that not much progress had been achieved. The Bonn Declaration on Learning for Work, Citizenship and Sustainability indeed stressed further that:

We, the participants in 'Learning for Work, Citizenship and Sustainability', a UNESCO meeting of international experts on TVET, are agreed that, since education is considered the key to effective development strategies, 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-UNEVOC, 2004).

Globalization and technological change resulted in modifying the nature of the world of work: the demand is towards a skilled, committed and motivated workforce that matches the new requirements. It is believed that greater exposure of trainees to sustainability concepts, practices and examples is more likely to lead to the desired change in the workplace culture in the future.

The delivery of sustainability practices must take place in pre-service TVET as well as in on-the-job training and in worker upgrading and retraining. TVET is both a consumer and producer of resources and therefore has many different concerns about sustainability. This situation will continue to predominate in the future in order to reflect both technological advances and job change.

The existing practices at the Industrial and Vocational Training Board's École Hôtelière Sir Gäetan Duval (IVTB-EHSGD) emphasize the fact that TVET is central to achieving the Millennium Development Goals (MDGs). In Mauritius, TVET has been in existence for a number of years, although its importance has accelerated since the late 1980s with the setting up of the IVTB and subsequently the Technical School Management Trust Fund (TSMTF). Since that period, it has evolved gradually to its present state where a module on awareness of environmental issues and an examination of the consequences of man's activities on the environment now forms part of the training programme. It can also be pointed out that the IVTB and all its trainees celebrate World Environment Day on 6 October every year and new initiatives to develop the trainees' creativity and sense of belonging are usually launched on that same occasion. The first tourism studies were introduced at the IVTB-EHSGD some ten years ago through a two-year vocational diploma course designed to produce middle managers for the tourism sector. Other training programmes were intended to make graduates employable in the tourism industry immediately after graduation. However, when the IVTB diploma in tourism was reviewed in 2003, other imperatives came to the fore and different stakeholders from the tourism industry, involving both the private and public sectors, were brought together with a view to harmonizing their strategies in order to ensure a relevant training programme aimed at safeguarding and enhancing the tourism industry. The curricula were redesigned with a view to making trainees more competitive on the global market. Various modules were then introduced, such as:

- (a) economy—encompassing, inter alia the impact of tourism on the economy of Mauritius;
- (b) geography and history;
- (c) ecotourism and cultural tourism;
- (d) tourism planning where the teaching emphasis is laid on an understanding of the importance of proper planning and the development of tourism in order to sustain it;
- (e) real case studies in Mauritius and other countries throughout the world;
- (f) knowledge of current affairs, amongst others things (see: <www.ivtb.mu/ehsgd/index.aspx>).

Thus, samples of insights covered in the programme include an analysis of the impact of tourism and its limits of growth—demographic, technical, institutional—and social aspects associated with the growth of tourism and trouble-shooting. As part of the course, the students need to carry out a study tour (preferably overseas), three work placements, as well as completing a professional project in collaboration with professionals in the tourism industry. The overseas study tour allows the students to better understand and live the reality of international tourism and make a personal assessment of the possible impact—positive and negative—of tourism on the society of the country visited. Over and above their training programme, students are called upon to participate in projects of local interest, such as cleaning debris in a river bed, adopting and greening a traffic island, etc. This further helps to raise their awareness about sustaining the quality of the environment in which they live, alongside the necessity for them to earn their living decently and for the country to progress economically.

In that respect and as already mentioned, every year the IVTB and all its trainees celebrate the World Environment Day on 6 October and new initiatives to develop the creativity and sense of belonging of the trainees are usually launched on that occasion. A couple of years ago, the EHS GD signed the pledge for an environmental charter developed by the Association of Hotels and Restaurants of Mauritius. In 2008, IVTB launched the Green IVTB project encompassing a series of projects (ranging from the simple to the more ambitious) in line with the new Mauritian Government's 'Building a Green Mauritius' Project, an initiative that was clearly spelt out in the budget speech of 2008/2009. To further enhance this new initiative, one trainer was made responsible for training in the related modules of 'economy and tourism planning', so as to emphasize the case for the integration between economy, society and environment.

The mode of teaching and learning used so far in the different tourism programmes offered in Mauritius has been very effective in making the students employable. It has certainly contributed significantly to the development of the sector as it has helped, *inter alia*, to produce the right number of trainees in increasing numbers every year and to increase employability of those trainees trained within the IVTB and by the other training providers.

In spite of the critical importance of a workforce aware of sustainability to control the expansion of the tourism sector in Mauritius, there has never been any systematic effort to identify the initiatives integrating education for sustainable development (ESD) in TVET undertaken by these institutions. The purpose of this study was to bridge this information gap. However, in addition to the IVTB, there are many independent private training institutions, major groups of hotels with their own in-house training services and the two Mauritian universities that provide training in tourism studies. Hence, it is timely that an inventory of all the measures, however diverse, be carried out and a model developed that brings together all TVET programmes being offered in Mauritius.

1.1 Objectives

The ultimate objective is to get all these stakeholders together and discuss the possibility of coming up with a coherent approach to ESD that can be integrated in all TVET programmes. The objectives are:

1. To determine approaches TVET providers are using to integrate ESD in their training programmes.
2. To determine if there is a coherent approach being used for integrating ESD in TVET programmes.
3. To assess the level of awareness of ESD amongst lecturers/training officers involved in the teaching of tourism studies
4. To determine barriers to enacting ESD in training.
5. To find out the perceived knowledge, skills and attitudes the students might require in order to live and work in a sustainable way.
6. To determine the extent to which ESD is being incorporated and to assess its relevance in tourism studies.

2 Methodology

2.1 Data collection

In this challenging and dynamic world, we need to be aware that whatever we do today that affects our environment will have consequences that may last a century or more. Sustainable development is considered to be one of the main ways through which socio-economic development meeting present needs can be achieved without endangering our future. However, sustainable development is not a simple concept and introducing ESD in the teaching of tourism studies implies an integrated approach to economic, social and environmental issues. Sustainable development should not be seen to affect the ability of future generations to achieve their needs. In fact, the Brundtland Commission in 1987 defined sustainable development as 'development which meets the needs of the present without compromising the ability of future generations to meet their own needs' (United Nations, 1987).

With a view to eventually introducing ESD in tourism studies in Mauritius, a survey was carried out to find out the present situation in the teaching of tourism studies at the University of Mauritius, the University of Technology, the Industrial and Vocational Training Board and private training institutions where the subject is being taught, irrespective of the different levels of teaching.

Data collection was effected through the distribution of a structured questionnaire which was adapted from a similar one utilized by the Higher Education Academy in 2005. The questionnaire consisted of four sections, namely:

- Section A: Introduction, including the profile of the key informants;
- Section B: Defining sustainable development and its relevance to tourism studies;
- Section C: Pedagogy and resources, as well as possible barriers to enacting ESD in the training centres;
- Section D: Student experience.

The key informants selected were all training officers at the IVTB, including the Training Centre Manager, private training providers as well as university lecturers and the Dean of Faculty involved in the training of tourism studies.

The questionnaires were duly filled in and returned either by post or by e-mail. However, the actual number of lecturers and training officers directly involved in either training or lecturing in tourism studies in these different institutions is not large. Altogether some thirty training officers and lecturers have been identified either by contacting the responsible officers of the institutions and/or consulting the Mauritius Qualifications Authority Directory. They are either the Dean of Faculty, director/managers, lecturers or training officers/trainers. They were first contacted by telephone, after which the questionnaires were either e-mailed or hand delivered. They were given two days to one week to fill them in. Given the relatively small size of the population of interest, a census methodology was used. Seventy percent responded to the survey. It should be pointed out that all the training officers of the IVTB and the University of Mauritius who were contacted responded positively.

2.2 Data analysis

For the purpose of data analysis, five components of ESD (knowledge, skills, perspective, values and teaching issues) were incorporated in the formulation of the questionnaires distributed to all those involved. The key respondents were on the staff of the two Mauritian universities and training institutions.

At the University of Mauritius and the University of Technology Mauritius, tourism studies are offered at the first degree level, while the IVTB, the lead institution involved in training in Mauritius, provides training in tourism at the diploma level through its hospitality and tourism training centre, namely the EHS GD. The EHS GD,

the first ever hotel and catering school in Mauritius operational since 1971, came under the umbrella of the IVTB upon the creation of the latter in 1988. The school eventually came to be called the Ecole Hôtelière Sir Gaëtan Duval, after the former Deputy Prime Minister and Minister of Tourism, and is the biggest hotel and tourism school in Mauritius. It played a crucial role in the development of the tourism sector in Mauritius and did a lot to place Mauritius on the world map as a high-class tourism destination. Ever since its inception, the IVTB, through its training in tourism studies, has catered for different categories of worker, from the lowest operational level to middle cadres. Through sheer hard work over the years and the quality of outgoing students who were readily accepted by the industry, the school has earned a sound reputation. Since 2009, it has introduced a top-up degree.

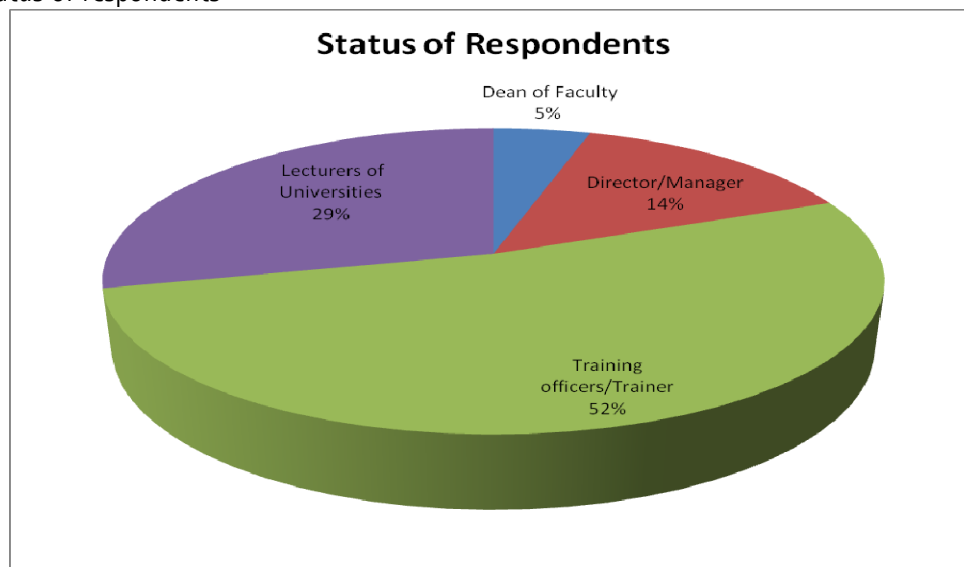
There are also private training providers in tourism studies, mostly at the operational level, namely the institutional training providers whose only business is the delivery of training. Their trainees may come from anywhere. There are also hotels that have their own in-house training provision, offering training exclusively for their own employees or for potential employees who will be working in their hotels.

The survey carried out was a qualitative one. Thus, to better analyse the data, they have been grouped in such a way that some quantitative analysis could be done to see whether there is a trend in the way the respondents answered the different questions. Concerning Section A (Introduction) of the questionnaire, respondents were asked some general questions regarding their background. There were two questions in this section regarding the name, status, e-mail address, contact numbers and the school/training centres/university where the respondents worked. All the respondents replied satisfactorily to this section, giving full details about themselves. The respondents can be categorized as follows:

- (i) Dean of Faculty, 5%;
- (ii) Director/manager, 14%;
- (iii) Training officers/trainer, 52%;
- (iv) University lecturer, 29%.

This distribution is better shown in Figure 1.

FIGURE 1: Status of respondents



3 Results

3.1 Definition of sustainable development

In Section B of the questionnaire (Definition), specific questions were asked to determine how lecturers/training officers conceptualize sustainable development and their appreciation about its relevance to the sustainability of the tourism sector. Firstly, respondents were required to define sustainable development. The responses provided by the respondents were analysed to see how close they were to the definition provided by the UNESCO-UNEVOC International Centre for TVET drawn up at the UNESCO International Experts Meeting of October 2004 in Bonn:

Sustainable Development is a culturally-directed search for a dynamic balance in the relationships between social, economic and natural systems, a balance that seeks to promote equity between the present and the future, and equity between countries, races, social classes and genders (UNESCO-UNEVOC, 2006).

Certain keywords/groups of words that were looked for in the responses were the following: process, balance of economy, social, environment and equity between present and the future. The analysis shows that, despite the lack of homogeneity in the different responses, it is encouraging to note that most of the respondents have done some research about the definition and/or have more or less a thorough understanding that sustainable development consists of the interdependency and interconnectedness between economic, social and environmental issues that are of utmost importance to safeguard the future. It is noteworthy that virtually every respondent tended to associate sustainable development with the element of environment and/or natural resources.

BOX 1: Examples of some of the most comprehensive definitions provided by the respondents

1. 'SD is the development that meets the needs of the present without compromising the ability of the future generations to meet their own needs'.
2. 'SD is a pattern of resource use that aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for future generations'.
3. 'It is about the development (regarding the triple bottom line) that meets the needs of the present without compromising the needs of the future generation'.
4. 'Development that meets the needs of the present without comprising the ability of future generations, that is meets the needs of the organization with respect to the local environment and community'.
5. 'Developing tourism in a holistic approach that is taking into account consideration of its impact on the environment, population, economy, of the destination'.
6. 'SD is development of the present resources in the view so that the future generation can also benefit [from] the resources'.
7. 'SD is development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.
8. 'SD is to use resources available to meet today's needs without compromising the future requirements of the same resources'.
9. 'SD is integrating the skills and resources of the local community within broader development so that there is fair and equitable share of benefits to all stakeholders which are less 'powerful' in the community. SD also considers preserving the natural environment as opposed to depletion of natural resources which is increasingly being observed due to intensive development'.
10. 'SD is development of a country, region or even organization utilizing resources in an efficient and effective manner so as to ensure it will not be detrimental to future generations and the planet.'
11. 'SD should aim at meeting the needs of the present generations and at the same time safeguard resources for future generations to meet their own needs'.
12. 'SD would be keeping a good environment at work while at the same time helping oneself to achieve in our career. Thus, keeping or using the resources effectively would help to maintain now and even afterwards; it will help to build on customer satisfaction (internal and external) and also work efficiently.'
13. 'SD is development which is long-term focused and environment-friendliness of all decisions providing for future generations'.

14. 'It is defined as a process of change through which the use of resources, the orientation of investment and technical and institutional changes are in harmony and strengthen the present and future potential to satisfy men's needs'.
15. '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 the future generations'.
16. 'SD is development which meets the needs of the present generation without compromising the ability of future generations to meet their own needs'.

Most of the definitions provided by respondents in Box 1 were seen to be more or less consistent in one way or another with the definition of sustainable development provided by UNESCO. This shows that the lecturers and training officers from the two universities, the IVTB and the private training providers have a thorough grasp of the definition of sustainable development. However, it is amazing to note that two of the respondents did not answer this question, implying that they might not be confident about their definition of sustainable development and/or have not conducted any research given the short time available. Their response could also indicate a total lack of awareness about the subject. Due to their very small number, it was not possible to verify whether there was a pattern among these responses. But it was surprising to note that one of the two who did not reply to this question was in a top management position and the other was a training officer. Unfortunately, due to lack of time, face-to-face interviews could not be carried out that would have helped to better understand their motivation.

3.2 Relevance of sustainable development in TVET

The second objective in this section was to ascertain the relevance of sustainable development within the tourism studies as perceived by the respective training providers. For the University of Technology of Mauritius (UTM) lecturers, sustainable development is crucial to tourism studies and is already fully integrated in them. The name of their faculty is indicative in that it is called the School of Sustainable Development and Tourism. On the other hand, the University of Mauritius (UOM) lecturers emphasized that sustainable development 'should' be included in the tourism studies offered by their university, indicating clearly that it is not yet the case. Concerning the training officers of the IVTB, their responses imply that different elements of sustainable development are offered in tourism studies, but they would like to see a complete module devoted to this subject.

3.3 Approaches for integrating ESD in TVET

This section covers the means and approaches in current use for integrating ESD in tourism studies and the possible barriers to enacting ESD within the different training institutions. 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. When asked about the other approaches that are being utilized to deliver ESD, no UTM lecturer answered this question, indicating that the only mode of delivery at the UTM is through traditional means. On the other hand, the UOM lecturers as well as the training officers of the IVTB and private training providers specified other approaches being used to deliver ESD, such as: placement in hotels and travel agencies; participation in educational tours; focus-group interviews; distance learning; e-learning; case studies; extra-curricular activities; talks by professionals; study trips and industrial attachments; interaction with industry; empowerment of trainees; site visits and evaluation exercises; and class discussions on the subject. These approaches could possibly be used with the aim of delivering ESD more efficiently and effectively. One respondent also indicated on-line delivery through the Moodle Course Management system, where the platforms included features such as discussion forums, wiki and blogging, where up-to-date information can be disseminated, shared and captured for the betterment of ESD.

Whilst, as mentioned above, all university lecturers at the UTM felt that ESD is already incorporated in the curriculum for tourism studies, those from the UOM firmly believe that introducing ESD is a must. On the other hand, all the training officers of the IVTB and private training centres believed that the objectives, concepts and learning experiences of education for a sustainable future are already included to a certain extent in the syllabuses. Indeed, they identified various other non-traditional approaches for the delivery of ESD besides

traditional means, such as lectures, seminars and tutorials. However, the IVTB training officers propose that a dedicated module for sustainable development is necessary.

Various modules were then introduced such as economy encompassing, inter alia the impact of tourism on the economy of Mauritius, geography and history, ecotourism and cultural tourism, tourism planning where the emphasis of the teaching is laid on the understanding of the importance of proper planning and development of tourism in order to have sustained tourism, accompanied by real case studies in Mauritius and other countries throughout the world, as well as knowledge of current affairs, amongst others. Thus analysis of the impact of tourism and its limits of growth, demographical, technical, institutional and social aspects associated with tourism growth rate and trouble shootings are just samples of insights covered in the programme.

The IVTB-EHSGD has been in the forefront in revamping its programme of tourism studies to make it more responsive to the needs of the industry and to some extent make the graduates more conversant with the elements of sustainable development. The emphasis in other industries is on greening the industry and equipping workers with green skills.

3.4 Barriers for integrating ESD in TVET

The second question of Section C asks about possible barriers preventing the introduction of ESD in tourism studies. Table 1 presents these barriers, which have been codified B1 to B18 for ease of analysis.

TABLE 1: List of possible barriers to sustainable development

B1	Awkward fit with subject area	B10	Lack of staff awareness
B2	Perceived irrelevance by staff	B11	Financial restrictions
B3	Curriculum too crowded already and lack of time to update courses	B12	Confusion over what needs to be taught
B4	Internal accreditation, validation systems, benchmarks	B13	Lack of markets for students
B5	Requirements of professional associations	B14	Lack of relevant course examples
B6	Lack of staff expertise and the need to acquire new knowledge	B15	Reality of future career conflicts with sustainability teaching
B7	Perceived irrelevance by students	B16	Lack of perception of big environmental problems
B8	Inability of students to grasp the issues	B17	Lack of academic rigour/misunderstanding
B9	Lack of institutional drive and commitment	B18	No barriers identified

ESD is a fairly new subject and not much progress has been achieved on a global scale so far despite the commitments of different Member States. Thus, each training provider seems to approach the subject of sustainable development in a haphazard way and from a different angle. Nevertheless, the question of how easy or difficult it is to introduce ESD in tourism studies, either as a subject or in a course that is already being taught, was seen to be very pertinent. It would necessarily provide decision-makers with an appreciation of the possible difficulties that they were likely to encounter if a decision were taken to integrate ESD as a model in all TVET programmes already on offer or to be introduced.

The respondents were provided with a list of issues (B1 to B17) in Table 1 that might act as potential barriers to the introduction of ESD in TVET and were asked to rate them in descending degree of severity with 1 as the most severe. B18 representing no barrier was also an option provided to the respondents. One respondent made a mistake when answering this question and could not be reached as she was out of the country; hence her response was not taken into consideration. All the other respondents replied to this question properly by ranking them from 1 to 17 and the following analysis is based on their responses.

For the purpose of the analysis, the degree of severity was broken into four categories, namely 1 to 5 (most severe), 6 to 10 (severe), 11 to 15 (less severe) and 16 to 17 (least severe). For the sake of simplicity, Table 2 presents these four categories in two groups.

TABLE 2: Severity of barriers to ESD in TVET

Most severe to severe	Percentage of response
Financial restrictions	95
Internal accreditation, validation systems and benchmarks	75
Reality of future careers conflict with sustainability teaching	75
Lack of staff expertise and the need to acquire new knowledge	70
Lack of labour markets for students	70
Less severe to least severe	
Perceived irrelevance by students	65
Lack of academic rigour/misunderstanding	55
Lack of perception of big environmental problems	55
Lack of relevant course examples	50

'Financial restrictions' came out strongly as the most severe barrier that might prevent the introduction of education for sustainable development in tourism studies. Indeed, 60% of the respondents indicated it as the most severe barrier and another 35% as a severe barrier. 'Internal accreditation, validation systems and benchmarks' as well as 'Reality of future careers conflict with sustainability teaching' and 'Confusion over what needs to be taught' have been indicated by 75% of the respondents as falling in the most severe to severe category. It has to be underlined that 70% of respondents also pointed to 'Lack of staff expertise and need to acquire knowledge' and 'Lack of labour markets for students' as the most severe to as a severe barrier for the introduction of ESD in tourism studies.

It is interesting to note that 65% of respondents rated 'Perceived irrelevance by students' as a less severe or least severe barrier, followed by 'Lack of academic rigour/misunderstanding', 'Lack of perception of big environment problems' and 'Lack of relevant course examples'. A further analysis of the responses might suggest that the biggest problems facing the introduction of ESD in tourism studies relate more to the means and system affecting the introduction of the subject and not the subject itself. There are similar fundamental issues to the introduction of any other subject that needs to be addressed. The necessary financial support together with the appropriate quality assurance system and clarification of what needs to be taught as spelt out in any curriculum to eliminate confusion are normal issues that should be addressed for the introduction of any module to be taught in any training institution or university. 'Lack of staff expertise and need to acquire knowledge' as well as 'Lack of markets for students' might no longer be major barriers in a few years time. Many Mauritians are specializing in environmental issues and businesses are becoming more concerned and involved in alleviating any socio-economic barriers through corporate social responsibility, most particularly in the tourism sector that depends to a large extent upon a sustainable 'green' Mauritius. Students specializing in sustainable development should not have problems in finding a job in the years to come.

It is not surprising that 'Lack of academic rigour/misunderstanding', 'Lack of perception of big environmental problems' and 'Lack of relevant course examples' have been placed as less severe to least severe barriers, since the questionnaire was answered by lecturers and training officers. But it is comforting to see that the latter rated 'Perceived irrelevance by students' as the least severe barrier. Thus, it should not be a major obstacle.

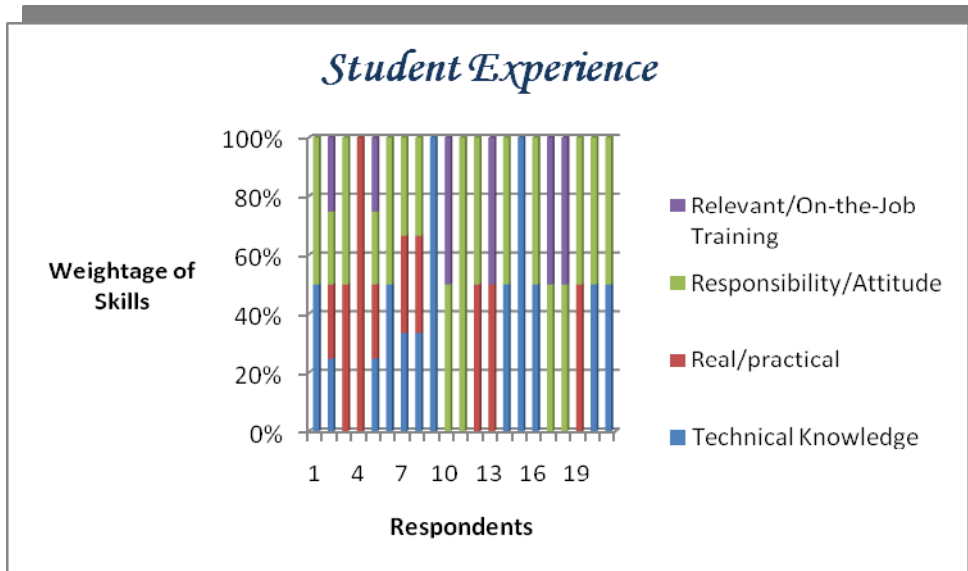
It may therefore be interpreted that most students are conscious of sustainable development issues, but need to be properly equipped through relevant training that will help them to be more responsible and address the issues professionally. This is in line with their answers to the next question where again the respondents mentioned right attitudes and responsibility towards sustainable development as one of the key factors that graduates might require to live and work in a sustainable way.

3.5 ESD skills development in TVET

Section D of the questionnaire deals with the types of knowledge, skills and attitudes that students might need to live and work in a sustainable way. The responses depict four main facets, namely 'relevant/on-the-job training', 'responsibility/attitudes', 'real/practical knowledge' and 'technical knowledge of sustainable development'. A high proportion of the respondents have identified right attitudes and responsibility towards sustainable development as one of the key factors that graduates might need to live and work in a sustainable way.

Furthermore, another important proportion of the respondents, mostly academics, indicated that technical knowledge of sustainable development is of prime importance. However, some respondents (mostly the training officers) believed that a combined approach of equal emphasis on practical training as well as on theoretical knowledge is a must, while relevant/on-the-job-training has been identified by a minority group. The analysis of this section is represented in Figure 2. Altogether it seems that 'right attitude and responsibility' is the most important facet to be developed by students if they want to live and work in a sustainable way.

FIGURE 2: Student experience



4 Discussion

Sustainable development is catching on at an unprecedented rate at the present time. After the meeting on climate change in Barcelona in November 2009, the Siemens CEO said that green products are the leading technology for the twenty-first century. This will be the third wave of industrialization. The Green Revolution has started and by 2020 green technology will have surpassed the car industry as well as the engineering sector in Germany.

But are different countries prepared to be part of this revolution? Are we in Mauritius getting ready for this change? The government has come up with a series of measures in recent years to sustain a 'green' Mauritius, more so since Mauritius forms part of the Small Islands Development States (SIDS) that are predicted to be the worst affected by climate change. Recently, at the Commonwealth Heads of Government Meeting (CHOGM) in Trinidad and Tobago, it was decided to devote at least 10% of the US\$10 billion fund to deal with climate change and global warming towards vulnerable states. Other suggestions accepted were the transfer of technology and the appointed date to grant help to small States.

However, it is also being argued by the Mauritian Minister of the Environment that it is imperative that Mauritian consumers change their behaviour in order to achieve sustainable development in Mauritius. The editor-in-chief of the magazine *Eco Austral* argued that the sustainable development revolution must start first in our minds if it is to happen (*L'Eco Austral*, 2009).

This case study has in a small way tried to look at the status of our TVET system, most particularly our training approach to tourism studies which is one of the very first sectors to be impacted by climate change which will have repercussions on the socio-economic development of Mauritius.

5 Conclusion and recommendations

5.1 Conclusion

The findings of this study confirmed the haphazard introduction of sustainable development as an element in the teaching of tourism studies at the various training institutions in Mauritius. This conclusion has been reached despite the commitment and leadership of the Mauritian Government in the struggle to protect our environment with a view to sustaining the tourism sector, a major contributor to the economy and an important employment provider. It is, however, interesting to note that virtually all of the definitions of sustainable development provided by respondents to the questionnaire were more or less consistent in one way or another with the definition of sustainable development provided by UNESCO. This shows the high level of understanding of the concept of sustainable development among lecturers and training officers from the two Mauritian universities, the IVTB and private training institutions.

However, when it comes to the type of knowledge and skills that might be required of graduates to be able to live and work well in a sustainable environment, unsurprisingly the academicians seem to place heavier emphasis on theoretical knowledge while the training officers preferred a combined approach of equal emphasis on practical training as well as theoretical knowledge. A similar artifice can be seen in the teaching of engineering at some universities, where focus is placed on an academic approach resulting in graduates who are not readily employable. A mixed approach combining theory and practice would be the best method to provide future students with the best skills to advance and sustain sustainable development. In fact, the IVTB-EHSGD has since 2004 introduced new modules in the Diploma in Tourism Studies that closely resemble ESD.

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. In Mauritius, a tremendous amount of work has been done at the level of different institutions in a disorganized manner, as well as at the level of the Ministry of the Environment, to promote awareness with regard to the protection of our environment. It is in this respect that various awareness-raising campaigns have been initiated by the Ministry of the Environment. Similarly, research on solid waste and renewable energy has to a certain degree been initiated by professionals—too few though to make any significant impact on society.

The major barriers to the integration of ESD in TVET have been identified by respondents as financial ones, an appropriate quality assurance system, lack of staff expertise and the need to acquire knowledge, as well as a lack of markets for students. It is not surprising therefore to find out that many of our training officers and lecturers involved in delivering training/lectures in tourism studies, whether at universities or training centres, with the exception of those of the IVTB-EHSGD, have so far barely integrated any elements of sustainable development in their subjects. However, these are problems that could easily be resolved with further commitment, particularly if a coherent strategy was developed and accepted by all concerned. Already the government has shown the way by creating the 'Building a Green Mauritius' Project (GMP) with an appropriate budget. What is needed is a concrete and shared action plan that can be implemented according to a time frame. These are not problems that are difficult to grasp. A proper project proposal discussed and agreed by all partners should be prepared for consideration under the GMP.

Lack of staff expertise and the need to acquire knowledge as well as a lack of markets for students should not be major barriers any more in a few years time. Many Mauritians are now specializing in environmental issues. Students specializing in sustainable development should also not encounter problems finding work in the years to come as it seems that companies are getting more and more involved in the idea of a Green Mauritius through their corporate social responsibility actions. According to respondents, teaching of the subject itself might not pose problems as the perception is that it is neither a difficult subject to teach nor to grasp. It would certainly not be a major problem to arouse interest among the young students. However, it is its introduction and effective delivery that poses the biggest problem that needs to be addressed. Until and unless there is an

accepted and shared strategy and action plan for the inclusion of ESD in TVET with its contents clearly defined together with full commitment on the part of policy decision-makers to support its introduction and delivery, integrating ESD into TVET might never be a reality.

To conclude, this case study has shown the true status of ESD in the teaching of tourism studies in Mauritius. The situation might be the same if not worse in other TVET areas. The possible barriers to its introduction have been identified and necessary recommendations to help integrate ESD into TVET have been proposed. We have no doubt that implementing them will be a step forward on the way to building a nation literate in sustainable development—to the benefit of our future.

5.2 Recommendations

Taking into consideration the findings of the survey, the following measures are recommended to facilitate the integration of education for sustainable development into technical and vocational education and training:

- An action plan for a national TVET sustainability policy should be developed at the level of each Member State. A model to integrate ESD in TVET should be developed urgently, agreed, tested in some institutions (a combination of training centres and universities in some selected countries), fine tuned and adopted. It is urgent to identify different countries to trial this process and to bring it to fruition. The key presenters could start working on this model in their respective countries with one person (such as Chris Chinien) co-ordinating the project. A pilot study could be launched in some selected countries. Mauritius could be one of them and the IVTB the lead organization in its implementation inviting university lecturers and private training centres to participate. A certain experience exists already at the EHS GD and it might not demand a great effort to come up with such a model. Mauritius has already distinguished itself at the Commonwealth Summit by the diplomatic prowess of the Prime Minister in facilitating a consensual agreement on the question of hosting the next summit and in securing 10% of the US\$10 billion Climate Change Fund for Small Islands Development States (SIDS). Thereafter, a workshop should be held bringing together all the pilot implementers for a debriefing session and to decide how best to include ESD in all TVET programmes, bearing in mind the potential barriers as indicated in the survey. An implementable action plan can then be prepared.
- In order to ensure implementation, ESD can be an item on the agenda of the Southern African Development Community (SADC) of Presidents/Prime Ministers. The policy-makers would be informed accordingly so that they can take informed decision. There must be political will to ensure the necessary systemic support.
- The necessary budget should be earmarked for the ESD as financial restrictions have been perceived to be the most severe barrier preventing the introduction of ESD by training providers. Funding could be obtained from the Green Mauritius Fund.
- As indicated by the UNESCO International Experts Meeting in Bonn in October 2004, there is a need to re-orient TVET curricula to better prepare students and trainees about the conservation and sustainable use of resources, social equity and appropriate development, as well as with competencies to practise sustainable tasks at the workplace (UNESCO-UNEVOC, 2004). Thus, training materials on ESD could be developed by UNESCO and the International Labour Organization (ILO). 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.
- 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.
- A sustained national campaign by the relevant authority about the importance of sustainable development should be initiated in different countries. In Mauritius the IVTB could try out sustainable development in its different training centres. It is probable that the necessary funding could be obtained from the Green Mauritius Fund

References

- Power, C.N. 1999. UNESCO's Programme on Technical and Vocational Education for the First Decade of the New Millennium. In: UNESCO. *Final Report: Second International Congress on Technical and Vocational Education*. Paris: UNESCO.
- L'Eco Austral. 2009. Le développement durable ne doit pas être l'opium du peuple. *L'Eco Austral* (Port Louis, Mauritius), no. 13, 2009.
- United Nations Educational, Scientific and Cultural Organization—UNESCO. 1999. *Final Report: Second International Congress on Technical and Vocational Education*. Paris: UNESCO.
- United Nations. General Assembly. 1987. *Report of the World Commission on Environment and Development*. New York, NY: United Nations. (Resolution 42/187, 11 December 1987. The Brundtland Report.)
- UNESCO-UNEVOC. 2006. *Orienting Technical and Vocational Education and Training for Sustainable Development: A Discussion Paper*. Bonn: UNESCO-UNEVOC.
- UNESCO-UNEVOC. 2004. *Bonn Declaration: Learning for Work, Citizenship and Sustainability*. Bonn: UNESCO-UNEVOC.

Other sources

- The challenge of TVET reform in Mozambique* <www-wds.worldbank.org>
- Dawe, G.; Jucker, R.; Martin, S. 2005. *Sustainable development in higher education: current practice and future developments*. (A report for The High Education Academy, York, UK, November 2005.) <www-new2.heacademy.ac.uk/assets/York/documents/ourwork/sustainability/sustdevinHEfinalreport.pdf>
- Industrial and Vocational Training Board. 2010. *Diploma in tourism studies curricula*. Réduit, Mauritius: IVTB/EHSGD. <www.ivtb.mu/ehsgd/index.aspx>
- Mauritius. Government. <www.gov.mu/portal/site/cso>
- Mauritius. Ministry of Education and Human Resources. 2007. *TVET reform: contributing to shape the future of Mauritius*. Port Louis.
- Mauritius. Ministry of Finance and Economic Empowerment. 2010. *Budget speech, 2010*. <www.gov.mu/portal/site/MOFSite/menuitem.5b1d751c6156d7f4e0aad110a7b521ca/?content_id=f979d9565e005210VgnVCM1000000a04a8c0RCRD#_portal_goc_mof_files_budspeech09_pdf>
- TVET issues and debates <info.worldbank.org>
- United Nations Educational, Scientific and Cultural Organization—UNESCO. <www.unesco.org>
- United Nations Educational, Scientific and Cultural Organization—UNESCO. 1999. *Final Report, Second International Congress on Technical and Vocational Education*. Seoul, Republic of Korea. Paris: UNESCO.
- United Nations Educational, Scientific and Cultural Organization—UNESCO. 2010. *UNESCO Strategy for the United Nations Decade of Education for Sustainable Development, 2005-2014*. Paris: UNESCO.
- UNESCO-UNEVOC. 2006. *TVET for sustainable development: opportunities and challenges*. (Experts' meeting held in Ho Chi Minh City, Viet Nam, 2–5 July 2006.) <www.unescobbk.org/education/apeid/programme-areas/tvet/>
- United Nations. 2000. *United Nations Millennium Declaration*. New York, NY: United Nations. <www.un.org/millennium/declaration/ares552e.htm>
- United Nations. General Assembly. 2005. *United Nations Decade of Education for Sustainable Development*. New York, NY: United Nations. (A/RES/59/237.)

A CASE STUDY OF PRACTICES IN INTEGRATING SUSTAINABLE DEVELOPMENT IN TVET

THE CASE OF MOBILE MISSION MAINTENANCE VOCATIONAL TRAINING CENTRE, NDOLA, ZAMBIA

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Abstract

In the technical and vocational education and training (TVET) sector in Zambia, some attempts have been made to apply sustainable development at the institutional level. This paper looks at the practice of integrating entrepreneurship in TVET carried out by the Mobile Mission Maintenance Vocational Training Centre (MMMVTC) in Ndola, Zambia. The purpose of the study was to examine the extent to which MMMVTC had integrated the principles of education for sustainable development (ESD) in its skills development programmes. The specific objectives of the study were:

1. To examine the definition of sustainable development as used by the centre;
2. To examine how entrepreneurship training in TVET has incorporated economic, social and environmental issues;
3. To identify methods that trainers use to deliver sustainable development;
4. To highlight some of the best practices that the MMMVTC employs in entrepreneurship training with respect to economic, social and environmental issues;
5. To identify barriers and challenges faced by the centre in integrating economic, social and environmental issues in entrepreneurship training;
6. To identify the business case for integrating ESD in the entrepreneurship training programmes.

The study used a series of interviews and a questionnaire to collect data. The first phase was a 45-minute interview conducted with the training manager of MMMVTC. The responses of the interview are included as an Appendix. The second phase was a questionnaire that was distributed to three members of staff: one from the administration and two from the teaching staff.

The study found that the staff at the centre defined sustainable development as 'development of both the social and economic areas that impact positively on citizens and the graduate applying their skills in society to reduce poverty'. Members of staff stated that the relevance of sustainable development was that 'the training was useful to the graduate and the community'. The methods used to deliver sustainable development in the training programmes are students carrying out projects, forming student companies and an emphasis on practical work. The study found that the most severe barriers were: financial restrictions; the requirements of professional associations; internal accreditation and validation systems; the reality of a future career conflicts with sustainability teaching; lack of staff expertise and the need to acquire new knowledge; lack of staff awareness; and lack of academic rigour/misunderstanding. The knowledge and skills identified by the respondents that could ensure that graduates lived and worked in a sustainable way included knowing about the relevance of sustainable development as a way to avoid conflicts in their future.

The study recommended that UNEVOC in Bonn, Germany, should collaborate with the Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA) to hold awareness workshops and produce publications on sustainable development for training institutions and those involved in TVET. Technical education, vocational and entrepreneurship training policy and TVET curricula need to address issues of sustainable development.

It was also recommended that MMMVTC should employ different approaches in order to integrate ESD in TVET, such as plays, publications like magazines and talks by people from organizations that are implementing sustainable development effectively. To incorporate sustainable development in teaching programmes, MMMVTC also needed to procure materials on sustainable development available through UNEVOC and the Internet. These materials should provide simple and practical approaches on the incorporation of sustainable development in teaching programmes. It was also recommended that TEVETA should ensure that all curricula have aspects of sustainable development integrated in them. The Ministry of Science, Technology and Vocational Training, as the policy-maker, and UNEVOC need to ensure that sustainable development is popularized. They should also provide a policy framework for the integration of sustainable development in TVET institutions. Further, it was recommended that UNEVOC should identify the knowledge, skills and attitudes that are required for the development of ESD skills. These needed to be integrated in TVET documents, such as the policy documents, strategy papers and curricula.

1 Introduction

1.1 Background

This article looks at the practice of integrating entrepreneurship in technical and vocational education and training (TVET) by the Mobile Mission Maintenance Vocational Training Centre (MMMVTC) in Ndola, Zambia. The purpose of the study was to examine the extent to which MMMVTC had integrated the principles of education for sustainable development (ESD) in its skills development programmes. The article outlines the problem statement and provides some background information to the study, as well as the objectives. The methodology of the study discusses how data were collected and analysed. This is followed by a presentation and a discussion of the results of the study. The paper ends with conclusions and recommendations on how entrepreneurship training can be improved in order to lead to sustainable development.

Entrepreneurship training has been offered in TVET institutions in Zambia since 1996. It was introduced in order to meet the challenges of a shrinking formal sector where TVET graduates could not be assured of jobs. A number of institutions started to offer entrepreneurship training as a stand-alone subject, while more recently they have integrated entrepreneurship training into various programmes. Entrepreneurship is the process whereby an individual or group uses organized efforts and means to pursue opportunities to create value and growth by fulfilling wants and needs through innovation and uniqueness, no matter what resources are currently controlled (Robbins & Coulter, 2004:43). In the pursuit of opportunities, it is important that issues such as environmental, economic and social sustainability are addressed in the training and practice of entrepreneurship. Sustainable development is a pattern of resource use that aims to meet human needs while preserving the environment so that those needs can be met not only in the present, but also by future generations.

UNESCO (2002:1) defines ESD as a vision of education that seeks to balance human and economic well-being with cultural traditions and respect for the Earth's natural resources. ESD is important in TVET because, although students need to acquire skills to earn an income and run a profitable enterprise, this should be done in a way that does not deplete the Earth's natural resources and should also take into consideration the well-being of present and future societies. Zambia has been represented at high-level sustainable development meetings, such as the World Summit on Sustainable Development held in Johannesburg, South Africa, in 2002. Sustainable development has been made one of the national priority programmes within ministries, some of whom have taken a leading role, such as those of Finance and National Planning, Foreign Affairs and Tourism, and Environment and Natural Resources. In the TVET sector, UNESCO has held seminars and conferences and produced publications on sustainable development as it relates to the TVET sector. African nations, including Zambia, that are Member States of UNESCO have signed agreements and protocols on sustainable development in TVET. The degree of implementation of sustainable development in TVET in African nations has varied with some nations attaining some progress while others have lagged behind.

In the TVET sector in Zambia, some attempts have been made to apply sustainable development in TVET. This has been carried out at the institutional level. One such institution is the MMMVTC, a TEVETA-accredited and Examination Council of Zambia certified institution. It is a non-profit Christian mission that seeks to empower, encourage and equip people. MMMVTC offers entrepreneurship training and has set up its own graduate companies where graduates have been able to form partnerships and create small business enterprises. Since 2006, in addition to training, the training centre has created initiatives that have seen graduates set up viable and sustainable work projects. These initiatives expanded the current training styles and mind sets of both trainees and trainers, thus helping graduates to start their own enterprises (Mutono, 2008:1).

Integrating sustainable development in TVET has its own challenges. Some of the challenges in integrating education for sustainable development in TVET include:

- The general lack of cooperation both for TVET and teacher education for TVET across sectoral boundaries between and among NGOs, government, industry providers and international agencies.
- The division between theory and practice in TVET and TVET teacher education.
- The general lack of contextual responsiveness in both TVET and TVET teacher education -- their isolation from real work and employment contexts. There is a common failure to keep TVET and TVET teacher education abreast of changes in workplace practices.
- Educational approaches generated in developed countries may be unsuitable for transfer to developing countries and systems, given their association with unsustainable work practices.
- The lack of interactivity between TVET and ESD cultures and sectors.
- The lack of guidelines for sustainable development in TVET and TVET teacher education.
- The delivery of TVET and TVET teacher education uses traditional educational techniques and is driven by a supply-side culture.
- There is limited use of interactivity or networking among TVET teacher education practitioners (UNESCO-UNEVOC, 2007:5).

Other challenges include:

- The curriculum being already too crowded and a lack of time to update courses.
- Perceived irrelevance by staff and awkward fit with the subject area.
- Lack of staff expertise and the need for them to acquire new knowledge.
- Lack of institutional drive and commitment.
- Lack of staff awareness (Dawe, Jucker & Martin, 2005:28).

These barriers and challenges involve policy issues, curricula, staff awareness and cross-sectoral cooperation. In a developing nation like Zambia, these challenges are frequently encountered in the TVET system. This study will investigate this situation.

Some measures that could be used to improve the integration of ESD in TVET include drawing lessons from:

1. The 'sufficiency economy' project of Thailand, as an example of an integrated system for achieving sustainable development through TVET and lower-level TVET teacher education.
2. The sustainable VET modules developed in the Netherlands, as examples of creative approaches to engaging young learners in sustainable development issues.
3. The TVET curriculum revisions undertaken in Pakistan, as an example of revising TVET curricula to incorporate sustainable development.
4. The Australian Government's work to embed sustainability within TVET industrial training packages, through the National Centre for Sustainability at Swinburne University.
5. The National Institute of Science and Technology Education (NISTE) Entrepreneurship Resource Centre (NERC) in Pakistan, as an example of sustainable development in entrepreneurship programmes.
6. UNESCO Bangkok's programme of inter-agency consultations on TVET issues, as an example of how different stakeholders interact (UNESCO -UNEVOC, 2007:6).

The above recommendations can be applied to the Zambian situation once the barriers and challenges of integrating ESD in TVET have been identified. It is worth ensuring that transfer of knowledge is done after adequate consultation with different nations on best practices for ESD in TVET. Bhuwanee (2007:37) notes that:

If education is to be made sustainable in the life of the beneficiary, then it has to be delivered in an all-inclusive, multi-disciplinary and holistic manner, using the Integrated Education Program approach. An Integrated Education Program approach will comprise, but is not limited to literacy, vocational and life skills (including critical-thinking skills, skills to organise and interpret data and information skills to formulate questions as well as the ability to analyse issues that confront local communities), ethics and civic education, environmental protection, HIV/AIDS awareness through family planning programs, peace and conflict resolution awareness, information and communication technologies (ICT), democracy and human rights (especially children's rights), and gender issues. For this type of program to be sustainable, it must be contextualised in the culture, language, value, habits and traditions of the people. It must also

be rural or community based, using a non-formal approach. There is also the need to create linkages between these initiatives in order to achieve results.

By investigating how entrepreneurship training at MMMVTC has integrated issues of sustainable development, this study provided strategies on how entrepreneurship training can be carried out in other TVET institutions so as to involve sustainable development. The study also identified ways in which the case study could be used by other UNEVOC centres so as to draw relevant lessons for their own institutions.

1.2 Objectives of the study

Integrating the principles of education for sustainable development in entrepreneurship training for TVET is not an easy task. In a number of cases, entrepreneurship is taught like any other course. The objective of education for sustainable development is that students should derive some benefits from their training that will encourage them not compromise the ability of future generations to meet their own needs. For entrepreneurship training to be effective and lead to sustainable development, there is a need to have good role models and a practical approach. The purpose of this study was to examine the extent to which entrepreneurship training at MMMVTC integrates the principles of education for sustainable development in its skills development programmes. The specific objectives of the study were:

1. To examine the definition of sustainable development as used by the centre.
2. To examine how entrepreneurship training in TVET has incorporated economic, social and environmental issues.
3. To identify the teaching methods that trainers use to deliver sustainable development.
4. To highlight some of the best practices that MMMVTC has in entrepreneurship training with respect to economic, social and environmental issues.
5. To identify barriers and challenges faced by MMMVTC in integrating economic, social and environmental issues in entrepreneurship training.
6. To identify the business case for integrating ESD in entrepreneurship training programmes;

2 Methodology

The study used an interview and a questionnaire to collect data. The first phase was a 45-minute interview conducted with the training manager of MMMVTC. The responses of the interviewee are included as an Appendix. The second phase was a questionnaire distributed to three members of staff: one from the administration and two from the teaching staff.

2.1 Data collection

Data were collected by a face-to-face interview with the training manager and by self-administered questionnaires to three staff members of MMMVTC. Out of these three staff members, one was an administrator. The college has a total of fifteen members of staff. The questionnaire used was adapted from Dawe, Jucker & Martin (2005:48). The instrument had four questions where respondents were expected to define sustainable development, explain the relevance of sustainable development as offered by the training centre, describe approaches used to deliver ESD in the learning programmes and recommend the knowledge, skills and attitudes that graduates may require to live and work in a sustainable way. One question required respondents to rate the severity of barriers to performing their work, starting with 1 as the most severe barrier and increasing in number up to 10 for the least severe barrier. The staff members were deliberately selected according to the TVET programmes that they teach. The target population of the questionnaire was members of staff teaching in each of the four study programmes of the college. The target population of the study was five; returned questionnaires totalled three (60%). The data obtained from interviews and discussions was reduced into interview summaries, while that from questionnaires was analysed in order to obtain common patterns. The data collected in Question 6 of the questionnaire (the severity of barriers) was displayed in tabular form for easier comprehension.

2.2 Data analysis

In order to analyse the data that were collected during the research, two major activities were undertaken. These were the categorization and unitizing of data (Saunders, Lewis & Thorhnull, 2003:381). The next level of the analytical process was to attach relevant units of data to the appropriate category or categories that would be devised. The responses given in questions 3, 4, 5 and 15 were analysed to establish common and different definitions of sustainable development, understanding of relevance of sustainable development within the discipline offered by MMMVTC, methods of ESD delivery (if any) and the student experience as it relates to ESD. The barriers to enacting ESD at MMMVTC were analysed by taking the mean of responses by the three staff members.

3 Results

The results were presented in five categories according to the questions filled in by the respondents.

3.1 Definition of sustainable development

The study found that staff at the centre defined sustainable development as 'development of both the social and economic areas that impact positively on citizens and the graduate applying their skills in society to reduce poverty'. This shows an understanding of the social and economic areas as being part of the definition of sustainable development. It can be noted that the staff are agreed on the social and economic aspects of sustainable development. However, surprisingly, the aspect of environment is missing from the definition. The United Nations (1987) defines sustainable development as 'meeting the needs of the present generation without compromising the ability of future generations to meet their own needs.' The definition of sustainable development by staff at MMMVTC is similar to the United Nations definition with regard to meeting the needs of the present generation.

3.2 The relevance of sustainable development in TVET

Members of staff stated that sustainable development was relevant because 'the training was useful to the graduate and the community'. Further, the study found that entrepreneurship had to some extent incorporated economic, social and environmental issues with respect to society.

3.3 Approaches for integrating ESD in TVET

The data on the various approaches of integrating ESD were collected by staff responses to a question on how ESD was delivered at the institution. Respondents wrote their responses which were summarized by comparing similarities and differences. The study found that the methods used to deliver sustainable development in the training programmes were the students doing project work, forming student companies and an emphasis on practical work. During the interview conducted with the training manager, it was found that MMMVTC blended practical and theoretical training in order to deliver sustainable development. The manager stated that practical training helped to reinforce theory and sharpen learners' vocational skills. It was also found that the formation of student companies enabled the students to work together, using entrepreneurship to create employment for themselves and others. The training manager mentioned that 'graduates used the income raised from their businesses to sponsor new students for programmes at the centre. This was done for vulnerable students who could not afford to pay tuition fees. This provides economic sustainability for the community as the graduates are using their skills to provide access to training for students'. The training manager also said that 'the centre was working with the community to provide special programmes for women. This addresses social aspects of sustainable development.' From the above, it can be noted that the MMMVTC is making efforts to integrate sustainable development in its training through the formation of graduate companies and special programmes for women. However, these efforts could be enhanced if the centre taught more about the integration of sustainable development through literature and training.

3.4 Barriers to integrating ESD in TVET

The mean of severity of barriers rated by members of staff (as indicated in Table 1) was calculated so as to represent the average of the three respondents. The study found that the most severe barriers were: financial restrictions; requirements of professional associations; internal accreditation and validation systems; the reality of future career conflicts with sustainability teaching; the lack of staff expertise and the need to acquire new knowledge; the lack of staff awareness; and the lack of academic rigour/misunderstanding. To address these barriers there is a need to examine their root cause and to provide appropriate measures to address them.

TABLE 1: Hierarchy of possible barriers to sustainable development (1 being the most important)

Possible barriers	Severity of the barrier
No barriers identified	
Financial restrictions	1
Requirements of professional associations	3
Internal accreditation, validation systems, benchmarks	3
Reality of future career conflicting with sustainability teaching	5
Lack of staff expertise and the need to acquire new knowledge	5
Lack of staff awareness	5
Lack of academic rigour/misunderstanding	5
Perceived irrelevance by staff	6
Lack of market for students	6
Curriculum too crowded already and lack of time to update courses	6
Perceived irrelevance by students	7
Lack of perception of big environmental problems	7
Awkward fit with subject area	8
Inability of students to grasp the issues	9
Lack of relevant course examples	10
Lack of institutional drive and commitment	10
Confusion over what needs to be taught	10

3.5 ESD skills development in TVET

Data were collected using the question: 'What knowledge, skills and attitudes might graduates require to live and work in a sustainable way?' The following responses were given:

- 'By them knowing the relevance of sustainable development to avoid conflicts in their future'.
- 'By making the students very much aware of how to participate in sustainable development'
- 'They need to acquire skills that might help them with the issues on sustainable development'.

The responses focus mainly on the knowledge and skills required for ESD skills development in TVET. The respondents do not address the issue of attitudes, which is an important area if graduates are to live and work in a sustainable way.

4 Discussion of the results

The purpose of the study was to examine the extent to which entrepreneurship training at MMMVTC integrates the principles of ESD in its skills development programmes. The data identified some level of understanding that the definition of sustainable development includes aspects of social and economic development. The relevance of ESD to TVET was that it was 'useful to the graduate and the community'. The approaches for integrating ESD in TVET were not very well structured to the extent that they could not have been replicated in other centres. Barriers for integrating ESD in TVET were identified from the most severe to the least severe. For ESD skills development in TVET it was found that there was a need for graduates to be made aware of the relevance of sustainable development and how to participate in it.

4.1 Definition of sustainable development

The study found that staff at the centre defined sustainable development as 'development of both the social and economic areas that impact positively on citizens and the graduate applying their skills in society to reduce poverty'. This definition was supported by the existing literature in United Nations (1987) of meeting the needs of the present generation without compromising the ability of future generations to meet their own needs. It was understood that the social and economic areas are part of the definition of sustainable development. It can be noted that the staff agreed on the social and economic aspects of sustainable development. However, surprisingly, the aspect of environment is missing from their definition.

4.2 Relevance of sustainable development to TVET

The data found that sustainable development was relevant because 'the training was useful to the graduate and the community'. Further the study found that entrepreneurship education had to some extent incorporated economic, social and environmental issues with respect to society. In discussing the relevance of sustainable development to TVET, the Australian National VET Sector Sustainability Action group framework is used, which has developed four clusters on issues of sustainability:

- Developing a workforce skilled for sustainability;
- Providing VET system products and services that support skills for sustainability;
- Encouraging the adoption of sustainability values, principles and practices by VET leaders, partners and champions; and
- Reduce the VET sector carbon footprint (National VET Sector Sustainability Action Group, 2009).

These were used in the following paragraphs to analyse the responses given by members of staff when looking at the relevance of sustainable development in TVET:

4.3 Developing a workforce skilled for sustainability

To some extent MMMVTC has developed a workforce that is aware about sustainability due to the integration of sustainable development in the training programmes for students. However, this is not carried out in a structured manner by the MMMVTC and thus interventions are required that would lead to a more structured approach in the teaching of sustainable development. This would enable the students to have a mindset allowing them to apply the principles of sustainable development in the workplace.

4.4 Providing TVET system products and services

TVET system products are made up of the curriculum, the trainers, learning and assessment materials. From the responses given by the respondents, there is some effort at providing TVET system products and services that support skills for sustainability. However, this is not being performed in a co-ordinated manner. There is a need

for much clearer policy guidance on how the TVET system can provide products and services that support skills for sustainability.

4.5 Encouraging the adoption of sustainability values, principles and practices

In the case of MMMVTC, it would be expected that encouraging the adoption of sustainability values, principles and practices would be carried out by the director and the management team. From the outcomes of the study, it can be noted that there is a lot of work yet to be done on encouraging the adoption of sustainability values, principles and practices on the part of leaders, partners and champions. This needs to be promoted by MSTVT and TEVETA, who are the policy-makers and regulators.

4.6 Reducing the TVET sector carbon footprint

From the responses given by members of staff, it can be deduced that the issue of the TVET sector carbon footprint is not familiar to the administrators and members of staff. There is a need for advocacy of the TVET sector carbon footprint issues on the part of UNEVOC. This should be done for all TVET institutions.

4.7 Approaches for integrating ESD in TVET

The study found that the methods used to deliver sustainable development in the training programmes were: (a) students carrying out projects; (b) the setting up of student companies; and (c) an emphasis on practical work. During the interview conducted with the training manager, it was found that the MMMVTC blended practical and theoretical training in order to deliver sustainable development. The manager stated that practical training helped to reinforce theory and sharpen the learners' vocational skills. It was also found that the formation of student companies enabled the students to work together in co-operatives and use entrepreneurship to create employment for themselves and others. It can be noted, however, that the approaches for integrating ESD in TVET require further improvement to ensure that the concept of sustainable development is better understood and practised by members of staff and students. UNESCO (2007:12) recommends expansion of the knowledge-base where case studies should be researched in order to incorporate the experiences of small- and medium-sized enterprises and companies from developing nations and a learning network of those involved and interested in sustainable development be established. The relevance of sustainable development in TVET has been discussed in literature. Bulmahn (2004:3) states that:

Vocational education and training is an important lever to implement sustainability because it reaches people at the interface between learning and work. What is important is, on the one hand, imparting knowledge and skills which place what has been learnt in a theoretical context and, on the other hand, the specific implementation of acquired knowledge in vocational practice. And there is another issue: Vocational education and training does not only impart modern occupation-related skills and knowledge but also cross-occupational skills, such as independence and communication skills, the ability for networked thinking, openness towards other cultures and the ability to deal with contradictions and conflicts. In this sense, vocational education and training promotes the ability to recognise and use opportunities for sustainable action at the workplace. Furthermore, it enables people, as consumers and politically mature citizens, to take responsibility for other people and for the conservation of the environment.

4.8 Barriers to integrating ESD in TVET

The barriers identified in the study are similar to those found in the literature (Dawe, Jucker & Martin, 2005:28), such as 'curriculum being overcrowded, perceived irrelevance by staff, lack of staff expertise and lack of staff awareness'. UNESCO-UNEVOC (2007:5) also indicates the division between theory and practice in TVET and the lack of interactivity between TVET and ESD cultures and sectors as some of the challenges to integrating ESD in TVET.

4.9 ESD skills development in TVET

The findings in the study for this item revealed some understanding of what needs to be done to ensure that graduates have knowledge, skills and attitudes enabling them to live in a sustainable way.

- 'By them knowing the relevance of sustainable development to avoid conflicts in their future'.
- 'By making the students very much aware of how to participate in sustainable development'.
- 'They need to acquire skills that might help them understand the issues on sustainable development'.

The issue of attitudes is not addressed in these responses. Attitude or change of mindset is very important in any change programme. Sustainable development, being a relatively new area in TVET, requires a new mindset and attitude change in students if they are to live and work in a sustainable way. Examples of how to integrate ESD skills development in TVET include learning from Pakistan where TVET curriculum revisions incorporate sustainable development and Australia where sustainability has been embedded within TVET industry training packages through the National Centre for Sustainability at Swinburne University (UNESCO, 2007:6).

5 Conclusions

5.1 The definition of sustainable development

From the definitions provided by administrators and members of staff, a certain understanding of sustainable development can be seen, except that the aspect of 'environment' is not mentioned.

5.2 Relevance of sustainable development to TVET

The centre has seen the relevance of sustainable development to TVET. However, there is an incomplete understanding of the relevance of sustainable development to TVET by both administrators and members of staff. This calls for intervention from policy-makers and regulators of TVET.

5.3 Approaches to integrating ESD in TVET

There seems to be a lack of a proper approach to integrating ESD in TVET. At present, integration is being carried out in a non-structured manner. Though knowledge of ESD may be limited, there is some measure of application of ESD in entrepreneurship training. The MMMVTC's special programmes for women in the community help in addressing social aspects of sustainable development. Women, young people and handicapped persons are among the vulnerable groups. Therefore, the community programmes which include literacy lessons, hygiene and basic skills such as tailoring, empower women with the knowledge, skills and attitudes to become self-reliant entrepreneurs and to generate income for themselves.

5.4 Barriers to integrating ESD in TVET

The barriers that the centre faces in integrating ESD in TVET range from financial restrictions to confusion over what needs to be taught. If the most severe barriers are not addressed, it could lead to a failure to integrate economic, social and environmental issues in entrepreneurship training. There is therefore a need to ensure that these barriers are addressed by the MMMVTC, TEVETA and the MSTVT.

5.5 ESD skills development in TVET

MMMVTC identified the need for knowledge about the relevance of sustainable development among graduates and making them aware of how to participate in sustainable development programmes. Also noted was the need to acquire skills that might help them grasp the issues on sustainable development.

6 Recommendations

Based on the above conclusions, the following recommendations to improve entrepreneurship training with regard to the integration of education for sustainable development in TVET are made.

6.1 Improving knowledge of sustainable development in TVET

There is need for UNEVOC, in collaboration with TEVETA, to hold awareness-raising workshops and to produce publications on sustainable development for training institutions and those involved in TVET. The TEVET Policy and TVET curricula need to address issues of sustainable development.

6.2 Expanding approaches for integrating ESD in TVET

In addition to the methods that the centre is using to deliver sustainable development, the institution could also use plays, publications such as magazines and talks by people from organizations that are implementing sustainable development effectively. In order to incorporate sustainable development in teaching programmes, the MMMVTC needs to procure materials on sustainable development through UNEVOC and the Internet. These materials should have simple and practical approaches on the incorporation of sustainable development in teaching programmes. The centre also needs to conduct annual reviews on how it is integrating sustainable development in entrepreneurship training. It needs to ensure that teaching and support staff are aware of the importance of sustainable development in training. This could be carried out through seminars (face-to-face and on-line), discussions and publications. TEVETA as a regulator of TVET needs to support these awareness-raising efforts through publications and ensuring that sustainable development is part of the minimum standards in training programmes. It is also recommended that TEVETA should ensure that all curricula have aspects of sustainable development integrated in them. MSTVT, as the policy-maker, and UNEVOC need to ensure that sustainable development is popularized and should provide a policy framework on the integration of sustainable development in TVET institutions.

6.3 Improving ESD skills development in TVET

There is need for UNEVOC to identify knowledge, skills and attitudes that are required for ESD skills development. These need to be integrated into TVET documents, such as policy documents, strategy papers and curricula.

References

- Bhuwanee, T. 2007. A strategic paper on the reform and renewal of secondary education in Africa. *In: UNESCO. Reforming Secondary Education in Africa. Proceedings of a regional seminar.* Addis Ababa, 21–24 November 2006 Pp. 17–46. Dakar: BREDA.
- Bulmahn, E. 2004. *Speech by the Federal Minister of Education and Research at the UNESCO Conference on Vocational Education and Training, Bonn, Germany, 25 October 2004.* <www.unevoc.unesco.org/fileadmin/user_upload/pubs/SD_Bulmahn.pdf>
- Dawe, G.; Jucker, R.; Martin, S. (2005). *Sustainable development in higher education: current practice and future developments.* Hestington, UK: Higher Education Academy.
- Mutono, L. 2008. *Promoting skills training for employment and wealth creation.* Kitwe, Zambia: Ministry of Science, Technology and Vocational Training. (TEVET Stakeholders Consultative Forum.)
- National VET Sector Sustainability Action Group 2009. *National VET Sector Sustainability Policy and Action Plan (2009–2012).* <www.vta.vic.edu.au/docs/170209%20NVSSPolicy%20&%20Action%20Plan%20Consult%20draft.pdf>
- Robbins, S.P.; Coulter, M. 2004. *Management* (7th ed.). New Delhi: Pearson Education.
- Saunders, M.N.K.; Lewis, P.; Thornhill, A. (2003). *Research methods for business students*, 3rd ed. Harlow, UK: Pearson Education.
- UNESCO-UNEVOC 2007. *Final Report of the International Consultation on Education for Sustainable Development, Chiang Mai, Thailand, 19–24 August 2007.* Bonn, Germany: UNEVOC. <www.unevoc.unesco.org/fileadmin/user_upload/docs/Report_TVET_TE_TowardsSustainability.pdf>

Other sources

- Hisrich, R.D.; Peters, M.P.; Shepherd, D.A. 2005. *Entrepreneurship* (6th ed.). New York, NY: McGraw-Hill.
- Konayuma, G.S. 2009. *Relevance of entrepreneurship training in a market driven economy.* Lusaka: Ministry of Education. (Curriculum Review Symposium.)
- Konayuma, G.S. 2006. *Challenges of shrinking formal sector in Africa.* Livingstone, Zambia: Commonwealth Association of Polytechnics in Africa.
- Mertineit, K. 2003. *Berufsbildung für eine nachhaltige Entwicklung: erfolgreiche Praxisbeispiele aus Betrieben, Berufsschulen und Bildungsstätten* (Vocational education and training toward sustainable development: successful practical examples from enterprises, vocational schools and training centres). [In German.] <www.voced.edu.au/cgi-bin/get-iso8.pl?off=49746469>
- Technical Education, Vocational and Entrepreneurship Training Authority—TEVETA 2002. *Entrepreneurship curriculum chart.* Lusaka: TEVETA.
- United Nations 1987. *Our common future: report of the World Commission on Environment and Development (WCED).* Oxford, UK: Oxford University Press.
- United Nations Educational, Scientific and Cultural Organization—UNESCO. 2002. *Education for sustainable development.* Paris: UNESCO.
- Zambia. Ministry of Science, Technology and Vocational Training 1998. *Technical education, vocational and entrepreneurship training policy.* Lusaka: Ministry of Science, Technology and Vocational Training.

Appendix

Interview with the training manager

Interview of Ms. Jane Banda – Training Manager – Mobile Mission Maintenance Vocational Training College, Ndola by Gabriel S. Konayuma, Senior TEVET Officer (Entrepreneurship), Ministry of Science, Technology and Vocational Training on Friday, 9 October 2009.

Q: What courses are offered by the College?

The courses offered are:

1. Bricklaying;
2. Carpentry;
3. Tailoring; and
4. Construction management

Q: What is the level of training in these courses?

The level of training is Trade Test at Grade 5 and 6 levels.

Q: What is the duration of the training offered?

The duration is one year.

Q: How is entrepreneurship taught?

In the first two terms it is taught as a stand-alone subject while in term 3 it is integrated in the various courses.

Q: How are the graduates assisted to start graduate companies?

The graduates are attached to existing companies in Ndola and also encouraged to start their own companies as groups. The college has some projects which graduates take part in and part of the profit (30%) is paid to the college.

Q: What are some of the benefits of the graduate companies?

The benefits are:

1. Graduates have sponsored some students for training at the college.
2. The companies offer employment to graduates and others in the community.
3. Graduates are trained for self-employment.

Q: How does the college ensure issues of sustainable development are integrated in the curriculum and the courses?

The college buys finished wood for use in carpentry from a sawmill company that replants trees to replace those that are cut down. Students are assigned days to clean up the workshops and equipment used. This is meant to ensure a clean working environment. Students are also taught the importance of taking care of equipment and the workshops. In addition, the Tailoring and Construction Management courses have designated places for disposing of waste materials.

Q: How has entrepreneurship and graduate companies addressed economic issues?

This has been addressed through the graduate companies supporting and training graduates, thus creating employment in the community. Students are trained to be hard working and produce quality products.

Q: How does the college integrate cross-cutting issues such as HIV and AIDS, gender and disability in its curriculum?

The college teaches the students how to care for the infected and those that are disabled. Training in all the courses is open to any gender, although males tend to dominate the Bricklaying, Carpentry and Construction Management programmes, while females dominate the Tailoring programme.

Q: Could you talk about programmes that you run for the community?

The College runs a WIN (Women In Need) one-year programme for women in Kafubu block and George Compound in Ndola. These women are from the age of 28 upwards. The women are taught literacy, hygiene and tailoring.

Some of the challenges of this WIN programme are:

1. Commitment is a challenge, especially for married women who are also breadwinners.
2. During the farming season attendance is poor.
3. Literacy levels differ among the women. The women are taught in English and Cibemba.

Some of the opportunities are:

1. Improvement in the skills levels in the community.
2. Women are able to mend clothes and thus improve the appearance of their families.
3. Women can make clothes for themselves and for sale.

Acronyms

AIDS	Acquired immune deficiency syndrome
APEID	Asia-Pacific Programme of Educational Innovation for Development
BOTA	Botswana Training Authority
CBET	Competence-based education and training
CBTE	Competence-based education and training
CDF	Constituent Development Fund
CHOGM	Commonwealth Heads of Government Meeting
CSO	Central Statistic Office, Mauritius
CSR	Country status report
CTVE	College of Technical and Vocational Education
DESD	Decade of Education for Sustainable Development
EFA	Education for All
ESD	Education for sustainable development
DESD	Decade of Education for Sustainable Development
EHS GD	École Hôtelière Sir Gâetan Duval
GDP	Gross domestic product
GMP	'Building a Green Mauritius' Project
HIV	Human immunodeficiency virus
ICT	Information and communication technologies
IGA	Income-generating activities
ILO	International Labour Organization
ISSDP	Informal Sector Skills Development Programme
IVETA	International Vocational Education and Training Association
IVTB	Industrial and Vocational Training Board
KIE	Kenya Institute of Education
KTTC	Kenya Technical Teachers College
MDGs	Millennium Development Goals
MGDS	Malawi Growth and Development Strategy
MMMVTC	Mobile Mission Maintenance Vocational Training Centre
MOYA	Ministry of Youth Affairs and Sports
MOYAS	Ministry of Youth Affairs and Sports
NCCCK	National Council of Churches of Kenya
NISTE	National Institute of Science and Technology Education
NGO	Non-governmental organization
NQF	National qualifications framework
QDA	Quality data analysis
SADC	Southern African Development Community
SIDS	Small Islands Development States
SD	Sustainable development
SSTF	standard-setting taskforces
TEVET	Technical, entrepreneurial, and vocational education and training
TEVETA	Technical, Entrepreneurial, and Vocational Education and Training Authority
TIVET	Technical, industrial, vocational and entrepreneurship training
TSMTF	Technical School Management Trust Fund
TVET	Technical and vocational education and training
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNEVOC	UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training
UOM	University of Mauritius
UTM	University of Technology of Mauritius
VTI	Vocational training institute

Appendix: Data collection instrument

Questionnaire on ESD for training providers

A. Introduction

1. Subject centre name:
2. Name of person filling out the questionnaire:
 - Status of person:
 - E-mail address:
 - Contact telephone number:

B. Defining sustainable development for your training centre

3. What is your definition of sustainable development?
.....
4. What is the relevance of sustainable development within the [*discipline being investigated*] as offered by your training provider?
.....

C. Pedagogy and resources

5. How is ESD delivered within your area?
Through traditional means of delivery in lectures, seminars and tutorials..... Yes/No
Other approaches Yes/No
If the answer is yes, kindly spell out the approaches used:
.....

6. What are the barriers to enacting ESD within your training centre in order of priority? (**Using 1 AS THE MOST SEVERE BARRIER and 10 FOR THE LEAST SEVERE BARRIER**)

Possible barriers	Severity of the barrier
Awkward fit with subject area	
Perceived irrelevance by staff	
Curriculum too crowded already and lack of time to update courses	
Internal accreditation, validation systems, benchmarks	
Requirements of professional associations	
Lack of staff expertise and the need to acquire new knowledge	
Perceived irrelevance by students	
Inability of students to grasp the issues	
Lack of institutional drive and commitment	
Lack of staff awareness	
Financial restrictions	
Confusion over what needs to be taught	
Lack of market for students	
Lack of relevant course examples	
Reality of future career conflicts with sustainability teaching	
Lack of perception of big environmental problems	
Lack of academic rigor/misunderstanding	
No barriers identified	

D. The student experience

7. What knowledge, skills and attitudes might graduates require to live and work in a sustainable way?
.....

E. Focus group

Please consider the questionnaire just distributed and comment in general about your understanding of sustainable development and how you relate it to training in your institution and to Botswana as a country?

Please return the completed questionnaire to:

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