

ESD IN TEACHER EDUCATION INSTITUTIONS:
**Case Studies of Best
Practices in Zambia**



Overson Shumba and Heather Munachonga

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Zambia National Commission for UNESCO, Lusaka

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ACKNOWLEDGEMENTS

This book was conceived following an observation by the management of the Ministry of General Education that Education for Sustainable Development (ESD) best practices in institutions in Zambia were not documented and not widely disseminated. We therefore would like to acknowledge the Ministry of General Education through its Permanent Secretary, Mr Henry Tukombe. We thank the Vice Chancellor of the Copperbelt University for authorising Professor Overson to work with the Ministry and the Zambia National Commission for UNESCO to develop the concept paper and source funding from UNESCO. We thank UNESCO, Paris for funding the workshops and development of this book. We acknowledge the facilitation of the team at the Zambia National Commission for UNESCO through the Secretary General Dr. Charles Ndakala. The coordination of Ms. Heather Munachonga at the National Commission was indispensable. The Directorate of Teacher Education and Specialised Services provided support and Ms. Pascalina Chiliboyi participated and guided writers on SDG4 and the Global Citizenship Education (GCED). The book was a result of contributions made by public teacher education institutions. We would like to thank all the Principals and Deans of participating institutions for identifying the teams and coordinators of ESD who developed and contributed case studies for the chapters of this book. The following are the teacher education institutions whose case studies of ESD best practices are profiled: Chipata College of Education, David Livingstone College of Education, Department of Mathematics and Science Education, Copperbelt University, Mansa College of Education, Malcom Moffat College of Education, Mufulira College of Education, Kitwe College of Education, Solwezi College of Education, Kasama College of Education, Mongu College of Education, Charles Lwanga College of Education, School of Education, University of Zambia-School of Education, and the Zambia Institute for Special Education. We thank everyone and every institution contributing in one way or another. This book helps to profile and disseminate some of the examples of best practices in ESD in Zambia. In a small way this book demonstrates the Ministry of General Education's contribution towards the UNESCO Global Action Programme on Education for Sustainable Development.

TABLE OF CONTENTS

Acknowledgements	i
List of acronyms	iv
Introduction: Documenting and Disseminating Best ESD Practices in Zambia	1
Charles Lwanga College of Education: Promoting ESD and GCED Through Productive Entrepreneurship and Community Service Literacy Programme (COSLIP)	5
Chipata College of Education: The Change and Innovative Project Approach to Education for Sustainable Development (ESD)	14
Copperbelt University Department of Mathematics and Science Education: Integrating ESD and GCED into Biology Teaching Methods for Secondary Teachers	24
David Livingstone College of Education (DALICE): Drama and Music as Learner Centred Strategies for ESD And GCED	32
Kasama College of Education: Management and Disposal of Local Garbage and Litter	38
Kitwe College of Education: Education for Sustainable Development (ESD) in Comprehensive Sexuality Education and Environmental Management	46
Malcolm Moffat College of Education: Promoting Education for Sustainable Development through Gender Equality and Involvement in Scientific Innovation and Research	52
Mansa College of Education: Promoting ESD Through Waste, Technology and Expressive Arts Studies	60
Mongu Catholic College of Education: Education for Sustainable Development Through Expressive Arts, Technology Studies and Religious Studies	66
Mufulira College of Education: Learning Education for Sustainable Development and Global Citizenship Education Principles Through Preventive Maintenance System	72
Solwezi College of Education: Innovative Teaching and Learning With Poetry, Drama, Song and Cultural Ceremonies and Festivals	78

University of Zambia: Inventory of Best Practices on Education for Sustainable Development	85
University of Zambia: Environmental Education Community Outreach Activities	92
Zambia Institute of Special Education (ZAMISE): Promoting ESD through Community Collaboration at Zambia Institute of Special Education	97

LIST OF ACRONYMS

AAC	Anti-AIDS/HIV Committee
ACC	Anti-Corruption Commission
AFRITEIS	Africa Network for Reorienting Teacher Education Institutions for Sustainability
CBU	Copperbelt University
CDC	Curriculum Development Centre
COSLIP	Community Service Literacy Programme
CPD	Continuous Professional Development
DALICE	David Livingstone College of Education
DEC	Drug Enforcement Commission
DESD	Decade of Education for Sustainable Development
ECE	Early Childhood Education
ECZ	Examination Council of Zambia
EE	Environmental Education
ESD	Education for Sustainable Development
FAOSTAT	Food and Agriculture Organization Statistics Division
GAP	Global Action Programme
GCED	Global Citizenship Education
GHGs	Greenhouse Gases
GUPES	Global Universities Partnership on Environmental for Sustainability
ICTs	Information Communication Technologies
MACE	Mansa College of Education
MESA	Mainstreaming Environment and Sustainability in African Universities Partnership
NGO	Non-Governmental Organisation
PMS	Preventive Maintenance System
PPAZ	Planned Parenthood Association of Zambia
PU	Production Unit
REEP	Regional Environmental Education Programme
RTP	Regional Training Programme
SADC	Southern Africa Development Community
SDG	Sustainable Development Goal
SRC	Student Representative Council
SWEDESD	Swedish Centre of Education for Sustainable Development
THRASS	Teaching Handwriting, Reading and Spelling Skills
TV	Television
UN	United Nations
UNDESD	United Nations Decade of Education for Sustainable Development
UNEP	United Nations Environmental Programme
UNESCO	United Nations Education Scientific and Cultural Organisation

UNZA	University of Zambia
UNZAEESA	University of Zambia Environmental Education Student Association
VVOB	Flemish Association for Development Cooperation and Technical Assistance
YMCA	Young Men's Christian Association
ZAMISE	Zambia Institute of Special Education
ZANEEP	Zambia National Environmental Educators and Practitioners Association
ZATENSE	Zambian Teacher Education Networks for Sustainability Education
ZNBC	Zambia National Broadcasting Corporation

INTRODUCTION

DOCUMENTING AND DISSEMINATING BEST ESD PRACTICES IN ZAMBIA

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*In vain have you acquired knowledge if you have not imparted it to others-
Deuteronomy Rabbah (c.900, commentary on the Book of Deuteronomy)*

The UNESCO-led Decade on Education for Sustainable Development (UNDESD, 2005-2014) demonstrated the relevance and efficacy of Education for Sustainable Development (ESD) as a framework for re-orienting education to achieve quality and relevance for all. Zambia embraces ESD as an important holistic framework for transforming educational policies and making a difference at the level of practice at all levels of the education. Together with the other members of the international community, Zambia endeavours to implement ESD processes as featured in declarations such as the following:

- (i) The Future We Want by the UN Conference on Sustainable Development (2012) (Rio +20),
- (ii) the Global Action Programme (GAP) on ESD endorsed and launched at the UNESCO World Conference on ESD (2014) which celebrated the successful end of the UNDESD,
- (iii) the Incheon declaration Education 2030: Towards Inclusive and Equitable Quality Education and lifelong education for All emanating from the World Education Forum held in the Republic of Korea (2015), and
- (iv) Transforming our world: 2030 Agenda for Sustainable Development that contains the seventeen Sustainable Development Goals (SDGs, 2030) committed to by the international community at the UN Summit on Sustainable Development, New York (2015).

The SDG 4 in the UN Agenda 2030 is the education goal to “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”. SDG4 target 7 seeks to ensure that by 2030:

“all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non- violence, global citizenship and

appreciation of cultural diversity and of culture's contribution to sustainable development”.

2. Zambia's response, challenges, and strategies

Consultative meetings and workshops during 2015 reaffirmed the Ministry of General Education in Zambia as the custodian of quality education as mandated by the Education Act of 2011. It has been consistent in this regard as shown in policies themed Focus on learning (1992) and Educating Our Future (1996) that has since been the guiding national policy on education. In 2012, the Zambia Curriculum Framework emphasised that “this curriculum has been designed to meet the individual and societal needs through learning” (CDC, 2012; p. 17' <http://teachersforum.org.zm/assets/new-curriculum.pdf>), to address crosscutting issues or themes, and to promote responsible citizenship.

The Zambia Curriculum Framework (2014) the Standards and Evaluation Guidelines (2015) are consistent with SDG4 in focussing on ESD, global citizenship and crosscutting issues. Properly tackling some of the cross-cutting issues help to address SDG3 on good health, SDG5 on gender equality, SDG13 on climate change, and SDG14 (life below water) and SDG15 (life on land) on biodiversity. However, the number of educators, practitioners and researchers who are aware and are capable to implement ESD and the SDGs has not yet reached the critical mass sufficiently knowledgeable and confident for the desired transformation of education to achieve desired levels of quality and inclusivity.

The meeting of the Ministry of General Education's senior management in December 2015 was mindful of this deficit in awareness of ESD among practitioners. The management, however, also noted that over the course of the DESD and even before it, practitioners in Zambia have experimented and tested various innovative ways of tackling and integrating crosscutting issues and ESD in education. Many good practices in ESD remain hidden from the generality of policy makers, practitioners, and educators.

3. Scope of the Book

This book is concerned with documenting and disseminating some of the best ESD practices in the teacher education institutions in Zambia. Many of the **best practices are not well documented and not widely circulated in the education system. This book is concerned with packaging and disseminating, case examples of these best practices in ESD. In addition to contributing to the GAP process, the book contributes to the theme 'Improving Quality of Education through Quality Teachers: Sharing of Effective Practices towards the Post 2015', which was at the heart of deliberations at the Southern Africa Regional Conference on Teachers held in Maputo, Mozambique, 26-28 August, 2015.**

In the book, an ESD best practice is taken as an action or practice in an institution that contributes or has the potential to contribute to the SDG4 on education as well as other SDGs such as SDG3 on good health, SDG5 on gender equality, SDG13 on climate change, and SDG14 (life below water) and SDG15 (life on land) on biodiversity. Each institution takes a lead in presenting at least one of its best practices as a case example.

- **Charles Lwanga College of Education:** Promoting ESD and GCED Through Productive Entrepreneurship and Community Service Literacy Programme (COSLIP)
- **Chipata College of Education:** The Change and Innovative Project Approach to Education for Sustainable Development (ESD)
- **Copperbelt University Department of Mathematics and Science Education:** Integrating ESD and GCED into Biology Teaching Methods for Secondary Teachers
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- **Zambia Institute of Special Education (ZAMISE):** Promoting ESD

through Community Collaboration at Zambia Institute of Special Education.

4. Conclusion

The book illustrates some of the actions undertaken consistent with pursuit of the education SDG4 target 7. It is expected that this book will lead teacher educators and teachers to come up with further innovations and to integrate them in their professional work. Whole institution actions are encouraged so that best practices as found in this book can permeate and transform all aspects of the institution: the curriculum, teaching, assessment, research, extra-curricular activities, and operations, and must involve everyone, students, workers, lecturers, and the surrounding community.

CASE STUDY 1

CHARLES LWANGA COLLEGE OF EDUCATION

PROMOTING ESD AND GCED THROUGH PRODUCTIVE ENTREPRENEURSHIP AND COMMUNITY SERVICE LITERACY PROGRAMME (COSLIP)

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1. Introduction

This is a description of how Charles Lwanga College of Education is promoting Education and Sustainable Development (ESD) and Global Citizenship Education (GCED) through Productive Entrepreneurship and Community Service Literacy programme (COSLIP). There are five (5) sectors of the college production unit and one community service programme with the following objectives:

- To empower student teachers with productive, and entrepreneurship skills in agricultural related activities.
- To make the college self-sustaining through food production.
- To generate income for the college.
- To provide financial assistance to vulnerable students.

Figure 1. Students helping each other to administer an iron injection to a newly born piglet in the Production Unit.



- To improve the literacy levels among pupils in schools.⁷
- To develop and promote the spirit of volunteerism among trainee teachers.

All the sectors of the college production unit largely promote education and sustainable development since skills of productive enterprise are transferred not only to the students, but to members of staff as well. However, in a less direct way, GCED is also promoted because the right to education for all students is promoted, since even the vulnerable ones, who would otherwise have been excluded from the course due to financial challenges, are helped to pursue and complete their studies. In other words, one of the fundamental human rights of students, which is the right to education, is promoted. Pupils in the primary schools begin to develop an awareness of global issues through improved literacy from the COSLIP programme.

2. Description of the Initiative

A total of five (5) agricultural related productive areas are run by the college. These include the college garden, the cattle section, the poultry section, the piggery and the college field. All these sectors have a worker who is paid a monthly salary from the revenue generated. Although there is a committee of lecturers for each sector, one senior lecturer plays the role of manager. This officer is responsible for reporting to administration, supervising the worker and students and generally seeing to it that each entity is running efficiently. Students are involved in doing various tasks. Each class has a period for production unit on their timetable in a week, and this is the time they use to do production activities. Sometimes, managers of the Production Unit entities request groups of students to help during PMS in the afternoon on Wednesday. Science lecturers use these projects for some of their practical activities in Science Education course. Students that receive support from PU do a little more work than the other students; they work during weekends and during school holidays. In other words, PU is both a core curricular and an extra-curricular activity in the College.

The initiative is guided by a four pronged philosophy. It is intended to be an avenue for knowledge and skills transfer, income generation, food security for the college, and to support vulnerable students. Since students carry out most of the physical works in the PU sectors, skills of productive enterprise are transferred to trainee teachers, so that in turn, they implement these in the schools and finally pass them on to the children that they serve in the primary schools. In this way, development from the college is being sustained as it is being transferred from the lecturers to the Zambian communities.

A major aspect of the initiative is the support it provides for vulnerable students in the college using some of the income and savings that are made

from the PU ventures. The college is able to provide financial support to students who are vulnerable. Each year, vulnerable first year students are identified at the end of the third term, and are put on the college bursary scheme. They continue being on this scheme for the entire period of their training.

The college generates income, and is self-sustaining since it does not buy a number of essential food items from external suppliers. Food produced by the students is sold to the boarding, and this helps to serve money, and reduce on the running costs. As such, the college is able to charge nominal tuition and boarding fees that are not too high for the students. Apart from this, the college is able to procure equipment from the funds generated from PU ventures.



Figure 2. Planter bought from PU funds in October 2016.

3. Components of the Initiative

The components of the initiative include the college garden, the field, cattle rearing, and the piggery and poultry sections.

3.1 The college garden

The garden produces a wide variety of vegetables such as cabbage, rape and tomatoes that are sold to the college boarding and the surrounding community. Students learn how to grow various vegetables, and how to maintain them. They learn skills of effective soil management such as how to make composite using grass, how to use animal manure, how to control vegetable pests.



Figure 2. Second year students pruning tomatoes.

3.2 The college field

The college field produces a wide range of crops such as maize, soya beans, and watermelons



Figure 4. First year students and principal weed a field of watermelons.

Students working in the field learn how to plant and maintain various crops, including maize, sunflower, soya beans, butternuts, pumpkins, and watermelons. They learn how to apply various types of weed killers, as well as chemical fertilizers. Their attitudes towards physical work become more positive.

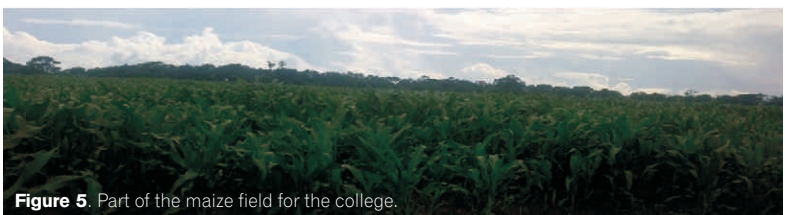


Figure 5. Part of the maize field for the college.

3.3 Cattle rearing section

The cattle section has more than 160 herd of cattle, and occasionally sells beef to the college boarding. The section has a dip tank that serves not only the college animals, but also cattle from the surrounding community at a fee on a weekly basis. This service is extended to the nearby community because the college realizes that its animals could still contract infectious diseases if animals from the nearby community are not treated.



Figure 6. College bull bought in November 2016.

At the cattle section, students learn the importance of dipping the animals weekly; they learn other management strategies such as vaccinating cattle against lamp skin infections, and East Cost fever. Students also learn the importance of alternating the types of dipping chemicals, since ticks develop resistance if the same chemical is constantly used.

3.4 The poultry section

The poultry section produces broiler chickens and eggs that are sold to the boarding and the nearby community. The droppings from the poultry are used in the college garden. Students learn how to keep broiler chickens from the first day up to the sixth week when they are ready for sale. They learn the various medications and food types suitable for every age. They also learn how to keep layers and the optimum conditions necessary for good egg production.

Figure 7. First year students feed layers.



3.5 The college piggery

The college piggery has about 200 pigs. At least twice in a year, the college supplies pork to ZAMBEEF in Lusaka, and termly to the college boarding. The college makes its own feed for pigs. At the piggery, students learn how to make feed using some chemicals such as lysine, D.C.P, pig booster, pig grower or pig creep. They also learn how to deworm the pigs, and the correct time of deworming them. Additionally, they learn general care and management of pigs such as teeth clipping and cutting of tails to avoid cannibalism among pigs



Figure 8. Pigs in the fattening pen.

4. Community Service Literacy Programme

Charles Lwanga College runs the Community Service Literacy Programme (COSLIP). This is a programme in which trainee teachers devote an hour of their time every Friday to teach reading to the children in the nearby schools.



Figure 9. Third year student in a COSLIP session.

COSLIP was introduced with the aim of improving literacy in the schools. A survey of the literacy levels in schools near the college showed that many children were reading at levels below their grade level, and some were not

able to read at all. Therefore, the college initiated this programme in an effort to solve the problem of low literacy levels in the schools. Additionally, the programme provides students with an opportunity to offer a charitable service to the community, since they are not paid for their contribution.

In the COSLIP, each student is given a small group of children to teach reading for the whole term. The activities of COSLIP are coordinated by lecturers in the Languages Department, in conjunction with the class teachers in the schools. Students prepare lesson plans using provided reading material, and the lecturers check these plans before they are delivered to the learners. Previously, pupils from the schools would come in the college every Friday at 15:00hrs for the reading lessons. However, now the students go out to the schools to teach the pupils. The resident class teacher is consulted before starting to teach a particular child. This helps to create a base line from which to start engaging a particular learner in some reading activities

5. Uniqueness, innovation and impacts of the initiative

The initiative of the college is unique and innovative. The college is located in an area that culturally thrives in agriculture engagements. Therefore, students are therefore empowered to uphold and promote the culture of self-sustenance. The literacy programme is empowering to both pupils and student teachers. The initiative helps transform people's attitudes towards physical work, and community participation. They become more focused, hardworking, and selfless. Female students learn to do tasks that are culturally perceived to be a preserve of the males and thus promoting gender equality and productivity.

From the PU ventures, some members of the community have found employment, and this has helped to improve their livelihoods. With financial support from PU, vulnerable students are able to complete their course. Women from the community help to slaughter chickens every two weeks. As appreciation, they are given chicken trotters, and intestines. This helps to improve nutrition in their families. Some members of staff have been inspired by the various PU ventures, and have since started similar ventures of their own. Students are able to demonstrate the various skills they have learnt, while a number of those who graduated are able to set up similar entities of their own in the schools.

The COSLIP programme helps the trainee teachers to develop attitudes of selflessness and community service, since they give their time and skills to the community without being paid, nor an assessment mark being attached to their input. When they graduate, they participate in development related projects in their communities, without demanding to be paid. COSLIP has further created an additional avenue for collaboration and dialogue among the college administration, the head teachers in the primary schools, the lecturers, students and class teachers as they routinely hold planning and review meetings for the COSLIP programme. Additionally, literacy levels in

the schools are reported to have improved. Finally, COSLIP is development related since it aims at making the learners more literate. A population that is able to read and write has access to information, and is capable of initiating and sustaining meaningful development that does not degrade the environment nor threaten the wellbeing of current and future generations.

6. Successes and challenges

There are successes as well as challenges associated with the initiatives run by the college. Box 1 shows the successes.

Box 1. Some of the successes

The college is able to support 30 vulnerable students every year.

1. Sufficient amounts of food are produce by the college through the students' efforts.
2. Tuition and boarding fees are kept low because of the extra income generated from PU.
3. Students are given survival, productive skills from PU.
4. Capital investments are undertaken using income generated from PU.
5. Improvements in literacy levels have been reported in the schools due to COSLIP.
6. Cattle diseases have been controlled in the college and surrounding communities.
7. Farmers near the college have improved their herds because of access to the college dipping facility. Other nearby institutions have also started similar projects.

Even with these noteworthy successes, there are some challenges to be observed. Not all vulnerable students are assisted through the college bursary scheme. Constant interaction between college cattle and that from the community has risks. Recently, one college bull was killed in a fight by another from the community. Lengthy procurement procedures sometimes lead to high mortality of the livestock. Constant power load shedding is affecting negatively on the garden, piggery, and poultry. Inadequate transport limits the number of schools in which COSLIP is implemented. The college has further ideas to ensure more innovation, to tackle challenges, and to achieve growth and sustainability (Box 2).

Box 2: Further ideas for innovation and growth

1. A comprehensive research to be carried out to assess the exact impact of COSLIP.
2. COSLIP is currently being reviewed with the aim of introducing another interactive methodology known as THRASS (*Teaching Handwriting, Reading And Spelling Skills*)
3. The confidence of students is boosted when they first deal with small numbers in the COSLIP sessions before going for teaching practice. Other colleges could start community literacy programmes in schools near them.
4. To expand the revenue base from PU so that more vulnerable students could be assisted.
5. To expand the college field, and introduce more crops.

CASE STUDY 2

CHIPATA COLLEGE OF EDUCATION

THE CHANGE AND INNOVATIVE PROJECT APPROACH TO EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD)

Crispin Cholwe

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1. Introduction

The Earth's climate has changed due to anthropogenic activities resulting into increased atmospheric concentration of greenhouse gasses. This is expected to lead to an increase in the mean annual temperature of about 1.2 to 3.4°C by 2060 (Thurlow, et al., 2009). These changes are projected to result into seasonal droughts, dry periods within the rainy season, intense rainfall, heat waves, increased temperatures, flash floods and changes in growing season as a result of delayed onset of rainy season or shortened growing periods. Climate change is likely to be the major cause of low food production, food insecurity, crop failure, flooding, collapse of fisheries and livestock deaths due to alterations in temperature and rainfall. Since the majority of Zambia's population lives in rural areas and is highly dependent on rain-fed agriculture for food and income, climate change will have very bad consequences for them.

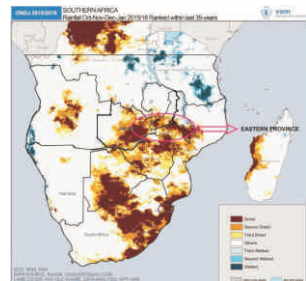
The Eastern Province of Zambia is one of the provinces showing early signs of being affected by climate change. Figure 1 shows the map of Zambia and the

Figure 1. Map of Zambia showing the position of Eastern Province and its districts.



Source: https://en.wikipedia.org/wiki/Districts_of_Zambia#/media/File:Zambia-districts-eastern_province.svg.

Figure 2. Rainfall map for southern Africa.



Source: <https://ec.europa.eu/jrc/sites/jrcsh/files/wfp-southern-africa-map-rainfall.jpg>.

location of Eastern Province. Figure 2 shows the rainfall distribution on a map of southern Africa. At least 50% of the Eastern Province has drier and driest effects.

Chipata College of Education is located in the capital of the Eastern Province. It draws its students from the districts shown in Figure 1. The climate scenario such as shown in Figure 2 has an effect on this institution. An example of this are students who come from the vulnerable districts in the rural areas that have less adaptation and mitigation capabilities. Due to this, the students are affected in some direct and indirect ways. It is the vulnerability that prompts the need to empower and engage in knowledge sharing that will enable the proper decision-making and an understanding of education for sustainable development (ESD). One of the aims of ESD is to nurture an individual who is able to solve environmental challenges facing the world and promote the formation of a sustainable society. This needs different approaches that suit the needs of the particular society. As an institution, Chipata College of Education has used the Innovative Projects Approach to bring about the best practices of understanding ESD to students and the community at large.

2. The change project initiatives

A variety of change projects are conducted in an effort to impart the necessary knowledge and skills among student teachers.

2.1 Tree planting and landscaping

As of 2011, 66% of Zambia's land was forest area. The annual deforestation rate is estimated to be around 1.5%, with 250,000 to 300,000 hectares deforested per year. (FAOSTAT, 2015). Zambia is ranked among the countries with the highest rate of deforestation and trend analysis from 2000-2030 predicts an increase in the deforestation rate. At this rate, we predict an increase in the effects of global warming and climate change to be high. This knowledge is needed by students who come from the communities that are highly affected by this. Tree planting will mitigate deforestation.

This activity was carried out with the support of one Non Governmental Organization (NGO) Total Landcare Chipata, Zambia. With the support of a Forestry Natural Resource Management Field Coordinator, my Community of Practice learned the skill of planting seedlings and manage them through and through until they are grown. A second workshop held attracted a donation of 2000 seeds of eight varieties, a watering can, a hoe and three cutters was made. Leadership in Tree Planting activity was to be achieved by the formation of a subcommittee to spearhead the activity and give direction on the way forward from henceforth. This was done on a voluntary basis where lecturers volunteered to be in this committee for this activity. The following seed varieties were donated and sown following the approach shown in Figure 3:

- Acacia Polyacantha Acacia Galpinii
- Senna Simea
- Senna Spectabilis
- Fidhebia Albida
- Khaya Nyasica,
- Albizia Leebeck and
- Oxytenanthera Abyssinica (Bamboo)

Figure 3. Tree planting activities.



A monitoring instrument (Figure 4) was designed to enable the one who plants to monitor the growth of the seedlings. It monitors also the variables that exist with different types of seed germination rates given the same atmospheric conditions. This exercise was a success and to date, the planting is ongoing.

CHIPATA COLLEGE OF EDUCATION
ENVIRONMENTAL EDUCATION &
EDUCATION FOR SUSTAINABLE DEVELOPMENT
MONITORING FORM FOR SEED GERMINATION

Name of Student: _____

Name of Seed Planted: _____

Date Planted: _____

	WEEK 1		WEEK 2		WEEK 3		WEEK 4	
	Has seed Germinated		Has seed Germinated		Has seed Germinated		Has seed Germinated	
	YES	NO	YES	NO	YES	NO	YES	NO
DAY 1								
DAY 2								
DAY 3								
DAY 4								
DAY 5								
DAY 6								
DAY 7								

Figure 4. Sample of student made seed germination monitoring instrument.

2.2 Waste Management Issue

As an institution, the major type of waste is paper. Since the college does not have equipment to recycle, a way to recycle had to be found. Every positive action done towards environment creates a positive impact despite the magnitude. The main focus here was to use the artistic skills students learn from Expressive Arts to address issue of Waste in the College. It is important to note that this project did not look at the issue of waste and the Environment alone but that it promoted the Creativeness and Innovative Skills which teachers are supposed to have to make their teaching interesting. The second Change Project is titled 'A Creative Approach to Improve Waste Management at Chipata College of Education'.

In promoting re-using, a Sustainable Centre in Figure 5 was built out of the waste and also re using the discarded iron sheets and other materials. This centre housed, Learning and Teaching Aids made by recycling waste. When these items were many, they were donated to the nearby school, Umodzi Primay School as Learning and Teaching Aids. The Sustainability Centre was razed down to pave way for building a more permanent structure.

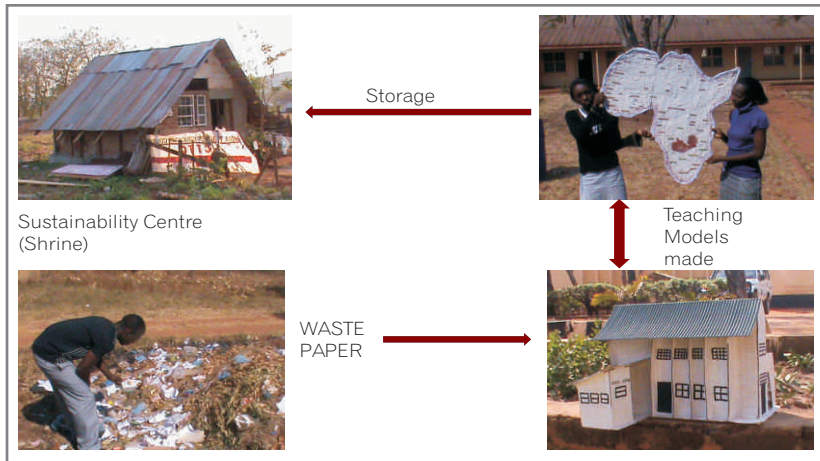


Figure 5. How paper is artistically recycled to make teaching and learning models stored in the Sustainability Centre.

2.3 Re-orienting the Mediating Activities and processes for ESD

The third Change Project is concerned with 'Re-orienting the Mediating Activities and processes for ESD'. The main theme basically looked at how the College has been involved in teaching, imparting knowledge to the students. Furthermore, the students have been making learning and teaching aids. But the question is, how effective has this been done especially in the new era of trends like globalisation, climate change, poverty and many issues that have come to stay? It is in this vein that a re-orienting of mediating activities (use of methodologies and learning and teaching aids and many others) to include the aspect of ESD. The ESD components are also important in order for Active Learning to take place.

When talking about ESD components, the knowledge, skills, values and perspectives and issues are brought to light. One should note that for any learning activity, to be effective, the teacher should have knowledge of the subject (all housed as ESD components) and also use learning and teaching aids which in this vein is mediating activities, i.e., models, charts, and others so that the end result is an active learning process. What ESD promotes is the trans-disciplinary approach, where all disciplines play a role in communicating the skill, values or knowledge respectively.

Figure 6 is the model or pattern that was developed to show the interaction between ESD components and the mediating activities to achieve a meaningful learning situation.

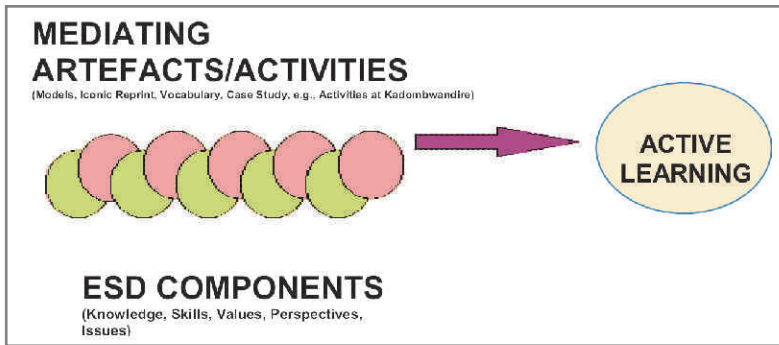


Figure 6. Active Learning when ESD Components and Mediating artefacts interact.

2.4 Efficient brick stove

Chipata College of Education graduates about 400 Students on average every year. Most of these are deployed in the rural areas, where they depend on either charcoal or traditional fires for cooking. In the vein where they use traditional fires, the fires emit a significant amount of smoke, which fills the home; this indoor cooking smoke has been associated with a number of diseases, the most serious of which are chronic and acute respiratory illnesses, such as bronchitis and pneumonia.

Moreover, where demand for local biomass energy outstrips the natural regrowth of local resources, environmental problems can arise. There is evidence that biomass fuels burned in traditional ways contribute to a build up of greenhouse gases (GHGs) (Venkataraman, et al. 2010), as well as other climate forcers, including black carbon (BC), in the atmosphere (Ramanathan & Carmichael 2008).

Going by energy demands, innovations that promote sustainable usage of energy need to be promoted. One such is the efficient brick stove shown in Figure 7. It is made of a mixture of 10kg river sand, 10 kg of anthill soil, 10 kg of cow dung, and 26 pan bricks. The stove lessens the demand for tree cutting but rather uses twigs to cooking stove is encouraged. The following bill of quantities follows the size of the brick stove to be made as the panbricks are smaller in size thus even the outlet holes where the twigs are put should not be too big, but smaller. There are other parts of Zambia that do not have so many trees thus lacking twigs, so this stove can use cow dung to cook. It reduces use of big logs of trees but uses twigs to help in cooking.

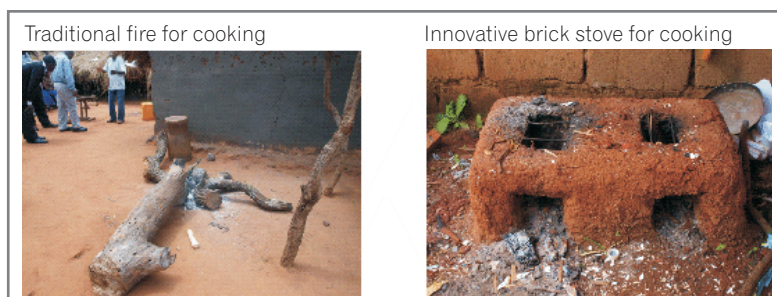


Figure 7. Efficient Brick Stove.

The benefits of this stove are shown in Table 1.

Table 1: Benefits of the efficient brick stove.

Health benefits	Environmental benefits	Social benefits
<ul style="list-style-type: none"> ▪ Decreases exposure to respiratory diseases ▪ Lowers effects of smoke to lung and eyes ▪ Eliminates severe burns risks in case of falling into open fires. 	<ul style="list-style-type: none"> ▪ Immediate reduces deforestation ▪ Cuts wood use by 60% or more ▪ Lowers threats to Climate Change 	<ul style="list-style-type: none"> ▪ 60% less time by women/girls to collect fire wood ▪ Reduces risks of rape in bushes ▪ Fewer bush trips

2.5 Engaging Academic Staff to promote Climate Change Awareness

Southern Africa like any other region in Africa experiences more severe droughts and floods due to climate change, and this is projected to intensify in the future. Therefore, Zambia due to its geographical location, high poverty levels, lack of adaptive capacity, inadequate investment in the agriculture sector and early warning systems makes it vulnerable to the adverse impacts of climate change (Vincent et al, 2012). Climate change has the potential to disturb many human programmes. Even when humans try to find solutions, there is a limit to which extent they can go. For instance, when human activities upset the natural phenomena of weather by cutting down trees, haphazard rain patterns could arise.

There are sectors that are considered most vulnerable. One example is the Agriculture. This sector hold within it the anchor board of life in that people's source of food is provided by it. This means that when this sector becomes vulnerable to Climate Change, the possibility of hunger and poverty trickle in. It is from this perspective that this report tries to bring out the effects of climate change on sectors like Agriculture and how this affects other sectors.

When other sectors like education get secondary effects of Climate change through Agriculture, human beings becomes vulnerable.

It is such realities that this topic tries to impress on the minds of student teachers to play a significant role in promoting awareness projects. This should be done through sensitization and campaigns. Some of the objectives of the topic included among others:

- To create awareness about the issues and risks of Climate Change to Chipata College of Education and promote sustainable remedies and solutions to climate change impacts.
- To influence new teaching strategies towards Climate change in schools through the revised curriculum.

Through these objectives, the major focus was the role that student teachers play in creating awareness both within the college community and within the school community where they go to teach.

3. Impact of the Change Projects in the Institution

When tracing the impact of Change Projects that have been implemented in the college, the main one has been the mindset paradigm shift, bring about an agency of change in the manner people look at the Environment. The Projects brought new insights that were grounded in transformative, experiential, and place-based approaches.

When engaging students in the change projects, a knowledge quest brought them to inquire more both in the classroom and outside environment thus developing a positive attitude with an agency to be better citizens and stronger problem solvers within the context of sustainability and beyond. Other initiatives like the 'Go Green Ambassadors' (Figure 8), where students want to keep the college Clean and Green have also helped to slow down the business as usual attitude where negative vices are just watched without a positive response to reduce or end them.

Figure 8. Go Green Ambassadors, an initiative by students to spearhead greening and cleaning the College.



4. Conclusion

The college has learned that the promotion of ESD and best practices in the institution needs an inter disciplinary, innovative and creative approach. It needs a collaborative approach where partnerships are identified to champion a common goal. Only when all are going to shift in old ways of thinking and doing, shall we have solutions that will benefit a sustainable livelihood for all.

5. Acknowledgements

The Coordinator acknowledges the following organisations and individuals for the success of the Change Project. The SADC-REEP WESSA and Environment Learning Centre at Rhodes University-South Africa, the Swedish International Development Agency (SIDA), and Swedish Meteorological and Hydrological Institute (SMHI) for some funding towards climate change research in the college. The Total Landcare (TLC) in Chipata played a supervisory role in the expansion of the Sustainability Centre. The support and efforts of the Principal, Mr. Peter Chishimba and colleagues Mr. Mwilola Namukolo and Mr. Joseph Phiri made for success of the projects in the college.

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CASE STUDY 3

COPPERBELT UNIVERSITY DEPARTMENT OF MATHEMATICS AND SCIENCE EDUCATION

INTEGRATING ESD AND GCED INTO BIOLOGY TEACHING METHODS FOR SECONDARY TEACHERS

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1. Introduction

In the ESD Lens (UNESCO, 2014) it was estimated that 70 million teachers in the world need to begin reviewing their teaching practices to include education for sustainable development. Therefore, preservice teachers must be trained with the objectives in mind that science education must be learnt for living and this requires adoption of appropriate teaching strategies. This is because ESD seeks to achieve a range of objectives to all areas of the curriculum- knowledge, values, and attitudes, thinking and decision making skills and active and informed citizenship. It develops the capabilities for participating in learning from sustainability practices. This is to be achieved by providing opportunities for students to investigate questions, issues and problems of concern to local and global society and to develop action competence for participating in tackling unsustainable practices of their choice.

We take the position that universities in which teachers are trained to teach must actively engage in programmes and initiatives to foster the aims of ESD and GCED. We observe that target 4.7 in Sustainable Development Goal 4 (SDG 4.7) aims to ensure all learners acquire knowledge and skills needed to promote sustainable development and good citizenship in local and global context. We integrate and incorporate this target into pedagogical approaches in biology education without diluting the existing curriculum. The focus has been in identifying problems in our local society and reflecting on it in terms of ESD. Pre-service teachers create lessons to teach and transform learners and the society upon this reflection.

2. The initiative

In this initiative, the Biology teaching methods course is the useful platform in which to integrate the ESD and GCED principles. The following are the objectives of the initiative.

- To bring certain objectives of ESD alive in formal, non-formal and informal education so that learners and the entire society learn school biology as well as values, responsibilities and social goals.
- Enhance the five fundamental types of learning to provide quality education and foster sustainable human development; learning to know, learning to be, learning to live together learning to do learning to transform oneself and society.
- Enabling people/society and pupils to detect changes, analyse the reasons and consequences of such changes, and provoke them to be committed to a sustainable lifestyle so that they can be motivated to participate and make a difference.
- To connecting biology education to the realities of life in the community, enhancing biology and not diluting it.

Box 1: How the innovation works

- Step 1- In the teaching methods course, students are given assignment to reflect and document experiences of growing up in their communities to identify environmental, social, economic, and cultural issues.
- Step 2- Students generate an aims of teaching and learning related to a syllabus topic with a focus to tackling the issue and design lessons to achieve them.
- Step 3- Implement the lessons incorporating ICTs, social media, etc.

The innovation is through teaching strategies in which students engage in practical work through the immediate environment and their communities of practice by using their scientific skills. These include observation and application of science in solving some of society's sustainable development problems and issues. Examples include skin bleaching, synthetic female hair disposal and environmental impacts on birdlife and other living things, drug abuse, tobacco smoking, life styles, environmental pollution and solid waste management, energy using charcoal and impacts on the environment, water and sanitation are used as case studies. Having identified the issues, student teachers use strategies that are learner centered. They create innovative lessons that include teaching using drama, simulation, social media and videos and pictures downloaded from the internet. The lessons also feature guest speakers such as ex-smokers are invited during lessons to answer questions, educate the learners on smoking and its dangers and ways of

quitting are used amongst students to learn the teaching methodology curriculum. This provides for practical, contextualized and transformative learning in a real life setting. This also stimulates the curiosity students have on their school communities.

2.1 Case study 1: Charcoal burning and energy

- We started with the group work assignment in which we identified problems in our local communities, e.g., charcoal and energy
- Thereafter, a lesson plan was created with clear aim and analyzed the syllabus to better teach the learners to know and to be transformed.

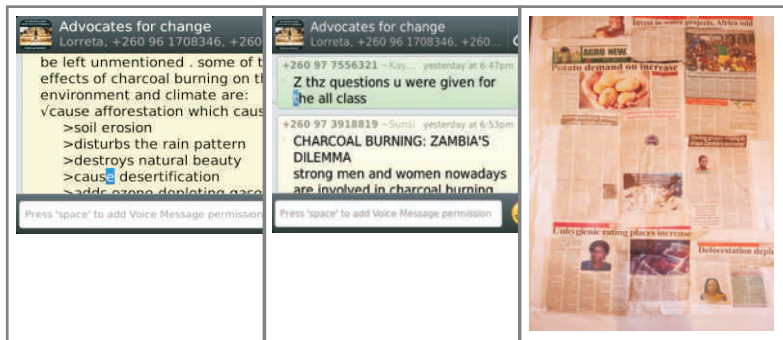


Figure 1. Some extracts of social media interactions and poster by participating students.

- Video on charcoal burning (Mufumbwe and Livingstone) were downloaded from YOUTUBE and incorporated it into a lesson plan for learners to watch.
- Teaching method employed were drama, debate, poetry, group discussions and problem solving.
- Teaching resources used were the social media such as WHATSAPP, FACEBOOK and YOU TUBE. For example, a student WhatsApp discussion group 'Advocates for change' was initiated. Posters were created too from local newspaper cuttings.
- Learners are assigned problem solving task on how they would deal with the issue practically, e.g., alternative energy sources.

Lesson is drawn after students look for videos educating the whole nation on dangers of charcoal burning and alternative solutions for charcoal as energy source from people in Mfuwe. The learners are challenged to come with alternative solutions for charcoal as the source of energy. Attached is the video used and discussions on WhatsApp on the solutions to charcoal as a

source of energy. Learners are also taken for a field trip in which they observe the forest from which plants are harvested and discuss the impact on the forest of the charcoal burning.

2.2 Case study 2: Beauty, lifestyles and skin bleaching

- As biology student teachers we created lesson plans by analyzing the syllabus on the topic health and the subtopic diseases. We incorporated skin bleaching and lifestyles as an issue in local communities.
- Lesson was taught to a group of first year students incorporating ICTs and social media, e.g., YouTube, WhatsApp, to explore issues of skin bleaching.
- We created a WhatsApp group where learners were able to share opinions and ideas on why people bleach their skin, values about beauty in different cultures. We collected pictures from Google used to educate the learners for transformation. On the WhatsApp group, learners are able to share ideas on how to sensitize the society on society issues such as skin bleaching.
- Transformative aspect of learning was shown through the WhatsApp groups created where the learners were able to share their views, opinions and suggested solutions to such society issues.
- The class also observed a video from the local community where a raven was entangled in a nest it had built with synthetic female hair fiber it picked from rubbish dumps. The raven was amputated and later died from its wounds.
- In the WhatsApp group, the learners were able to come up with ways of safe disposal of synthetic hair.



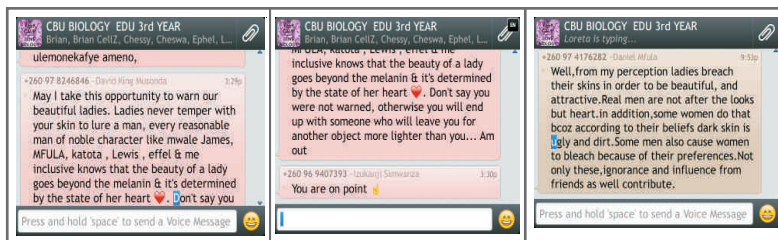


Figure 2. Some social media interactions by participants.

3. Impacts of the initiative

The initiative contributed as the learners learn how to identify topical issues connected to the school syllabus they will to teach and to solve society problems while achieving ESD and GCED goals. The initiative does change the way students think about issues in the society as they individually identify the problem, decide how to solve, transform their own life styles and how ESD and GCED is integrated through high school biology. As noted in the ESD Lens (UNESCO, 2014) practical projects and activities such as those in this initiative help students to learn in groups to explore alternative perspectives, reach their own conclusions and make plans to improve human wellbeing and environment through. It is hoped that the success of this initiative will influence practices in other science and mathematics education in the Department.

There are tangible results in terms of creativity the learners are developing in terms of searching for materials in which society problems are taught or presented. Being very creative in their presentation of work by avoiding teacher centered approached but more contextualized problems and problem solving skills. Being aware of the society issues in the immediate environment, using them to teach, and initiating that in learners.

3.1 Sample learner reflections

- "It is good because it will get rid of the memorizing aspect and replaced by knowing to doing as It involves case studies of real cases in class".(COSMAS)
- "I enjoyed because we never used to learn like this, and I'm sure pupils will reduce the tendency of abusing the internet".(HILTON)
- "I'm motivated with the way we have been taught, so beautiful and encouraging. I wish it could be introduced in schools it is so nice, because most of the things I learnt in grade ten, eleven and twelve, I have forgotten them. They say seen is believing. We just used to study for the sake of passing the exams." (MICHEAL)
- "Its quiet encouraging and I think if we are taught in this way, we will be innovative as we are living in a modern world where the issue of internet is concerned." (MERCY)

3.2 Uniqueness and innovative aspects

The innovation is unique as it changes the status quo in which knowledge is individualized and focused on learning to pass examination. The students are engaged in real-life problems with their input necessary to bring about change in the learners as well as the society. We are trying to achieve all these as a means of empowering our learners (the future generation) and all the people around us with new knowledge and skills to help resolve common issues that challenge global society's collective life now and in the future. Other student teachers are involved by participating in providing observed problems in the communities and as activists in solutions in which campaigns are done in the university, e.g., solid waste management campaigns using beauty issues of disposal of hair. The students provide the information using social media on what up and face book on the observed society issue in line with the case studies of students on ESD and GCED. Students learn how to work in groups to explore alternative perspectives reach their own conclusions and make plans to improve human wellbeing and environment through practical projects and activities. The innovation is in the formal curriculum and informal curriculum.

4. Successes and challenges

The impacts above show the success of the initiative as a best ESD practice. While the activities take a lot of time to prepare and a lot of creativity and critical thinking skills must be in the students. It requires a lot of collaboration among learners as they work and research on the issues.

The initiative provides a unique teaching approach that needs to be extended across the curriculum for teacher education. It should be encouraged to mainstream ICTs and to use social media technologies in appropriate ways to support learning.

5. Conclusion

Our approach is an emerging ESD best practice. We see teachers and their students fully engaged in the learning process and in analyzing real-life problems and lifestyle concerns in their communities.

- Bringing to class evidence of the problem of skin bleaching and the effects of bleaching skin, others would be ignorant of the dangerous effects. We bring pictures, videos and real life stories of people who have been affected by bleaching their skin. They can begin to explore choices centred on society's images of beauty, beauty products and their disposal.
- There are so many videos about skin bleaching that have been uploaded on YouTube, there are so many people viewing these videos and yet so many people are viewing the videos but the learners are still not aware. We need the teachers that can bring these videos to class.
- Preparing activities such as projects for the learners is important. For

example, they can collect information about values of beauty in different cultures about what people consider being beautiful information about some models and celebrities considered beautiful.

- The teacher create a notice board in class and the learners should be able to bring articles, journals and stories about skin bleaching and the dangers from newspapers every weekend we then stick these on the notice boards by doing this the learners become involved in learning for transformation. Learners can also analyse images on the internet bringing more awareness of problem issues and lifestyles and relevance in sustainable development.

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CASE STUDY 4

DAVID LIVINGSTONE COLLEGE OF EDUCATION (DALICE)

DRAMA AND MUSIC AS LEARNER CENTRED STRATEGIES FOR ESD AND GCED

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1. Introduction

The DALICE ESD/GCED initiative is the use of Music, Cultural Dances and Drama to provide entertainment and providing information and sensitization of college and surrounding community on various social issues. Student teachers who volunteer to join the respective sections of performing arts perform the songs, dances and drama. The initiative learner centred because the college does not determine the type of performances that are to be performed or songs to be sang by the participants.

The objectives of the initiative are:

- to encourage the appreciation of cultural, historical and social diversity in the Zambian society,
- to contribute to sensitization of current social, health and education issues to members of college and surrounding community.

The initiative contributes to promotion of appreciation of cultural, historical and social diversity as well as provide information on current social, health and health issues such drug abuse, early marriages, teenage pregnancies, climate change, gender, HIV/AIDS, etc.. These issues are the bedrock of ESD and GCED.

2. Description of the Initiative

David Livingstone College of Education has a vibrant College choir and a Drama and Dance Troupe. These groups are composed of students from all cohorts, subject sections and departments. Membership is voluntary. Apart from singing praise and thanksgiving religious songs like any typical choir, the DALICE College Choir composes and performs other songs. These songs are usually appropriate for particular national or college events such as welcoming visitors or bidding farewell to graduating students during graduation ceremonies. Some are descriptive recitations appropriate for

events such as the World Teachers' Day, Labour Day, World Aids Day or Women's Day or other such events. Apart from composing songs in English, the choir fluently sings songs in most Zambian languages. This aspect of the choir performances promotes a spirit of unity, nationalism and patriotism in its participants and their audiences. The choir is actually able to sing the National Anthem with various stanzas performed in the seven (7) official languages of Zambia.



Figure 1. The college choir in 2016.

The College Choir practices at least three times a week since they always lead in providing music during morning devotion every day and evening worship on Sundays. The most significant feature about the choir is that the group is capable of composing melodious songs relevant to specific and particular events even at short notice.

The Dance Troupe performs traditional cultural dances representative of all provinces of Zambia. The group performs dances typical of the Ngoni of Eastern province, the Mbunda, Lunda and Kaonde of North Western province, Lunda and Bemba of Luapula and Northern Provinces respectively, Lozi of Western province and Tonga of Southern province. The Troupe is especially called upon to be the main provider of entertainment during Graduation ceremonies and during some outreach programmes where they perform in neighbouring communities to disseminate information using

drama, traditional songs and cultural dances. The Drama group performs sketches that comically portray the typical issues in the Zambian society. The group also performs in various Zambian languages, especially the seven official languages. This is possible and appropriate because the college is more metropolitan rather than regional.



Figure 2. The college dance troupe in 2016.

All the entertainment groups are coordinated by the Entertainment Committee consisting of senior lecturers and student representatives of each section of performing arts. There are about eight (8) lecturers in the Committee, with at least two (2) of them being in charge of each section of entertainment groups such as drama, music, cultural dances, poetry etc. The Committee has a Chairperson who coordinates activities of the various aspects of entertainment.

Each of the entertainment groups is also organised in committee fashion with some leadership structures for smooth operations. Currently, the entertainment groups prepare for performances and practice their skills when there is an activity to which they are invited or for some routine programme like Morning Devotion for the College Choir or Graduation Ceremony.

During the first and third terms of each academic year, the Entertainment Committee organises an inter house competition in traditional dancing and aspects of theatre. The four groupings of the entire student populous referred to as "houses" namely: Temple, Kaunda, Muleya and Mwanakatwe, compete in various traditional activities on a day dubbed the "Zambian Night". This event is usually meant to identify talent and recruit students for

the college talent groups of choir, drama and dance troupe.

Apart from these local competitions, the college choir, drama group and dance troupe are usually very active when outreach programmes are organised. The outreach programmes involve these three groups going out to perform in local communities, especially at primary schools situated in densely populated communities within Livingstone. The recent outreach activities were sponsored under the Restless Programme where Peer Educators were being trained for dissemination of information and counselling. The programme was mainly dealing with HIV/AIDS issues.

3. Uniqueness and innovative aspects

Some of the unique things about the initiative of using entertainment provided by students for dissemination of important information concerning prevailing social issues are that participants are self-motivated, programmes are cost effective and activities are multi-lingual and nationalistic in nature. Membership to these entertainments groups is not restricted but open to all students. As a result, students that choose join are not obliged and thus things like absenteeism or lack of commitment do not frustrate programmes. The supervising students of members of staff not have problems with recruitment and retention of members and are not short of ideas about types of songs and/or dances.

The other aspect that is unique about this initiative is that it does not need large sums of money or other resources to be established. The key resource is the availability of willing and cooperative students. Other resources like recording machines, drums, modern musical instruments, costume or other relevant gadgets are procured just to add value and quality to the music and performances made.

The other unique thing about these groupings is that they are not culturally restricted or inclined to any regional orientation. This is especially facilitated by the fact that DALICE is a national college with students coming from all parts of the country. This makes it a very rich unifying and nationalistic programme. It helps to promote the members' appreciation of the cultural and historical diversity as they learn the songs and performances, and the history behind such activities.

The nationalistic aspect of the programmes should obviously rouse interest in advocates of Education for Sustainable Development (ESD) and Global Citizenship Education (GCED). This aspect is important for the performances in the local community because audiences are subjected to such diverse cultural performances and traditional songs. It is good for promoting unity, peace and tolerance.

The innovative aspect of the initiative is that it is not a direct mandate of the college to provide such a service to students or the local community. Drama and Music are not the main teaching subjects in the college curriculum.

These just feature in some components of subjects like that of literature in Zambian Languages and in Early Childhood Education. Therefore, the lecturers or other persons that are involved in these activities just use initiative at their own expense both in time and sometimes in resources.

4. Impacts of the Initiative

First, the initiative has profound effect on participants, the student teachers. The other immediate beneficiaries of the initiative are fellow student teachers and the members of the college community, at large, followed by the local community around the college campus.

4.1 Participating students

The participating students come to learn that their performances do not just end at entertaining the audiences but that they are a very effective tool in disseminating critical information about serious issues that concern their day-to-day lives. Even when their initial motivation to join the groups were for fun, participants come to realise that they have a serious and noble responsibility which is life changing for them as well as those who listen and watch them perform.

Participating students also learn to work with fellow students of other socio-economical as well as ethnical backgrounds. For students that that may have been brought up in typically homogeneous traditional settings, the college experience may be their first contact with fellow county men and women of other such backgrounds. Apart from learning new things in the college generally, such students also have new experiences that teach them to appreciate the diversity in ways of thinking and doing things. These experiences consolidate the students' characteristic features of tolerance and forbearance.

The other thing that these student teachers learn is how to organise these activities so that after completing their teacher education studies they would go and do the same in the schools where they are posted. Their participation also serves as capacity building in organisation and coordination of these very important co curricula activities.

4.2 Other student teachers

The other immediate beneficiaries of the initiative are the other students who see their colleagues spend time organising themselves to practice as they prepare to perfect their performances. These other students obviously observe the members of the College Choir or Drama or Dance Troupe as they prepare to perform or as they learn new cultural dances or traditional songs. Such interaction has some psychological and social effect on the concerned

students. Even students who think that they do not have the dancing or singing skills to join the cultural groups, may still observe and learn how important it is to prepare and organise such activities and how effective such activities are in disseminating certain important information.

4.3 Local Community

Members of the college community benefit from the activities of these traditional activities through enjoying the performances and learning from them. Instead of thinking about college students as being academically oriented and out of touch with current issues and happenings in the local community, residents are treated to the real character of the college studentship which well informed and determined to influence the lives of pupils and the communities they live in. The performances usually promote close interaction between the college and local community. Because of such harmony between the college and local community, it has been difficult for day students that live in Boarding houses in the immediate vicinity of the college to fit in the local community.

5. Success and challenges

The initiative of using the groups has been successful because of the determination of its participants, the students, to express themselves in the arts and traditions that are part of their heredity. One of the serious threats to the success of the initiative is the poor attitude by some members of staff and students and limited understanding or deliberate misunderstanding of the vision and mission of the college as well as the national educational policies with regard to the role of education in influencing life in the local community. Some members of staff and students tend to think of life in the college as being too academic that they view involvement in such activities as choir or drama and traditional dances as a waste of time and energy. This is especially so if the aspects of song and dance are not clearly spell out in the college curriculum.

6. Further ideas

In order to counter the negative attitude of many academic staff and students who look down upon the role of song and dance as a tool to inform society, it would be helpful to clearly pronounce the issues associated with ESD and GCED in the college curriculum. The issues highlighted in the SDGs are the "hot issues" that society, in general, is currently grappling with, so it would be a good idea if all efforts and energies, be they academic, political or physical, are exerted on finding solutions to deal with such issues. The first step would be to highlight the SDGs as crosscutting issues in the school and college curricula.

CASE STUDY 5

KASAMA COLLEGE OF EDUCATION

MANAGEMENT AND DISPOSAL OF LOCAL GARBAGE AND LITTER

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1. Introduction

Owing to increasing volumes of litter locally generated within the precincts of the College, Kasama College of Education devised diverse systems or mechanisms to significantly reduce litter and safely dispose of garbage. The initiative introduced is multi-faceted but feasible and practicable. It involves students converting waste to useful articles of academic value, transforming garbage or waste into manure, changing refuse to decorations among others. The objectives of the initiative include the following:

- To raise ESD awareness among the College Community members in order that best ESD practices may be sustained.
- To reduce litter through safe disposal modes
- To promote sustainable means of converting refuse / garbage into useful products.
- To cultivate sense of responsibility among the College Community members to enhance sustainability.

It is hoped that our initiative will have a huge impact on our College Community in particular especially with respect to provision and acquisition of relevant knowledge, skills, values and attitudes which will empower our students to live sustainably, and the Global community in general because our College is part of the Global village.



2. Description of the initiative

The College has a programme that provides a platform to share information with students on the ESD best practices so as to impart correct and desirable knowledge, skills, values and attitudes. This way they would be better poised to implement the ideas to cause the needed change. Every Wednesday afternoon, therefore, students have a special issues day. Rubbish bins have been designated based on waste type (biodegradable or none biodegradable) students and other users of the bins have to dispose of their litter in the right waste / rubbish bin. When the bins are full, students and workers help one another to transport the bins and empty them in the right places. In this case, bins that contain biodegradable waste are emptied into prepared pits and are used to make manure for the College garden. Non-biodegradable waste such as plastics including some biodegradable waste like paper waste is given to students to make articles of academic value. Teaching and learning resources are thus made out of this litter or waste. Waste such as glass, bottle tops, and others are converted to decorative articles. Every class is assigned

a litter day once in a month just to put litter at bay. This makes the environment look clean for a considerably lengthy time within a term. Lecturers too, have every Wednesday as their litter day. This goes to set a very good example for the student populace to realise the need for a litter-free environment.



Figure 1. Bin designated for plastics only.



Figure 2. Bin designated for biodegradables only.

The College has gone around the problem arising from food leftovers by keeping a good number of pigs that feed on these along with other food nutrients.



Figure 3. Pigs feeding on kitchen leftovers.

To ensure success and smooth running of this initiative, students and members of staff from different sections or departments are involved. For example, The Preventive Maintenance Committee, Boarding Committee,

Production Unit Committee, Special issues Committee, Students Representative Committee (SRC), Expressive Arts Department, Science Department and the ESD Coordinator. The Boarding ensures that food leftovers are given to the pigs. The Preventive Maintenance Committee works hand in hand with the ESD Coordinator to see to it that litter or garbage is sorted firstly, and then secondly, is disposed of correctly and in the right rubbish /waste bins.



Figure 4. Students disposing of litter by transporting it to designated sites.

The Production Unit is key to the whole process of making compost manure that in turn is used on the College garden. Various crops are grown on this manure-enriched piece of land.



Figure 5. Waste buried to produce composite manure for various crops.



Figure 6. Some of the crops grown.

The Expressive and Science departments liaise and collaborate with each other so that they design and give assessment questions or activities to students that are largely based on the use of refuse or waste to produce useful teaching and learning resources, some of which have been donated to primary and secondary schools within reach.



Figure 7. Some of the articles made out of waste (fruits, books, birds, TV set, plates, animals).

Whereas the special issues Committee plays a pivotal role in providing platform for disseminating ESD information and conducting timely educational campaigns to raise the much-needed awareness among the students, the SRC mobilises the student body so that the students can attend

the awareness meetings and help in the implementation of such initiatives as this.

3. How students, staff, and community members touched by this initiative

The College loans at Kasama College of Education do not only proudly show off a well-pronounced floral appearance but they are significantly litter-free. This, consequently, helps us send a signal to the surrounding communities and visitors that littering and careless disposal of waste is not entertained within our premises. Many visitors who call on us, and is evidenced by the correct way they dispose of litter when they are still on our campus have acknowledged this fact

The College is currently, effectively, engaging a nearby primary school so that the two institution could share, cross-pollinate ESD ideas and, hopefully, implement the same initiative. It is hoped that if and when the children are provided with the necessary ESD knowledge, skills, values and right attitudes in their early childhood, they would grow and develop into responsible citizens of the world.

4. What is unique and innovative about this initiative

Our initiative is unique in its own right. Sorting and treating litter or garbage according to their category, effective student engagement, Departmental collaboration, regular dissemination of ESD information to students and community engagement are aspects that constitute uniqueness about our initiative. We do realise that this initiative deserves a lot of attention and interest not only by the College Community but also by other concerned stakeholders within our province or country. We would like to see some stakeholders come on board and donate rubbish/ waste bins, wheelbarrows to ferry waste to designated areas and, from a broader stand point, we would like to see companies that recycle waste (plastic and metal) be established within our province. We would also like to see the Media house (electronic and print) to begin to develop interest in ESD issues so that they come on board to help Kasama College of Education disseminate ESD information to our surrounding communities. This would not only benefit the College but the World over. ESD issues should be every one's cup of tea.

5. Impact of the initiative

Although there are some topics related to ESD issues in the integrated science Education, ESD issues still remain an extra-curriculum until at such a time when ESD curriculum will be mainstreamed. It is observed that some students are willing to pick litter and rightly dispose of it of their own accord. This responsibility on the part of students is a reflection of a changed behaviour and an impact that the initiative has had on their mindset. The

other positive impact is evidenced by the reduction of litter around the college premises. This development seems to signal to us that students are picking litter and disposing of it correctly. Clean loans, reduced pests (such as cockroaches which are harbored by garbage / litter) and rodents, reduced diarrheal diseases among students, clean loans and general surrounding is a clear testimony to the fact that the initiative has positively impacted on our college community. Nothing to speak of the commendations we receive from our visitors. Most importantly, the impartation of knowledge, skills, values and desirable attitudes to our students that, we hope our students will transmit to or share with the younger generation brings joy and pride to our institution.



Figure 8. KACE is almost litter-free currently.

6. Successes and challenges

For any initiative to prosper there should be an interplay of unity, cooperation, commitment, concerted efforts and good administrative will. The College Administration has been key in this issue. The Administration is always there for us, eager to offer moral, financial and material support with a view to ensuring that our initiative is kept alive and sustained. The responsiveness from some Lecturers and students account for whatever success we have scored so far. Every one's willingness and sacrifice to work when they are called upon even at awkward times amid their busy schedules constitutes our driving force that gives us the stamina we need to accomplish set tasks.

Challenges have always been there, ranging from inadequate time to inertia expressed by some students and some lecturers. Naturally, any change is never embraced at first sight. Misgivings, inertia, criticism and unwillingness to participate in the initiative characterize the working climate when you wish to effect some change. There are so many

programmes running concurrently with our initiative. Since all these programmes depend on the same players, the situation will consequently pose a challenge of space and time. Busy students' and Lecturers' schedules compound the situation because ESD issues need time and commitment on the part of implementers. Our students come from different socio-economic backgrounds, and when we receive new students into the College, it takes some time to transform them so that they embrace and pick up the desirable ESD values and attitudes. This transformation is an evolutionary change that requires time and may be expensive and daunting. It also gives you a feeling that you are staring all over again as the new cohort of students may, seemingly, be virtually resistant to change.

7. Further ideas

Firstly, Our College intends to cast the net wider and extend the invitation to another primary or secondary school to come on board so that the ESD gospel may reach out to a wider community for the benefit of our Province and Nation. Secondly, our dream is to impress upon the Local Government to contemplate the possibility of establishing a recycling plant so that waste like plastic and metal are locally recycled. Our further target is ZNBC and community radios. We wish to engage these institutions so that the College is given an almost free slot so that we effectively disseminate the ESD information everywhere. We are actually doing enough as the College, but as long as a larger proportion of Zambian children do not access the relevant information and are not aware of the values we need, it will be a leap into the dark. Notwithstanding this fact, we are determined to transform our society in the face of any challenges. Lastly, but not the least, when our students go to various schools for their Teaching Practice, there will be a need for them to establish ESD clubs so that we reach out to as many children and schools as possible.

CASE STUDY 6

KITWE COLLEGE OF EDUCATION

EDUCATION FOR SUSTAINABLE DEVELOPMENT IN COMPREHENSIVE SEXUALITY EDUCATION AND ENVIRONMENTAL MANAGEMENT

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1. Introduction

Sexuality Education is one of the areas of concern the Ministry of General Education has included in the school and college curriculum. It is against this background that the college works in collaboration with other stakeholders such as Anti-corruption Commission (ACC), Drug Enforcement Commission (DEC), the Young Men's Christian Association (YMCA), Planned Parenthood Association of Zambia (PPAZ), and the Teachers of primary schools within our catchment area come for consultative and planning meetings to share ideas with students staff in the college of education. The following are the objectives of the initiative in the college:

- To equip students and staff with knowledge and skills to manage and over-come challenges in ESD
- To promote ESD in our learning institutions
- To promote GCED among the students and staff in order to positively enhance the appreciation of togetherness and brotherly love, peace and kindness.



Figure 1. Formal lecture on sexuality education.

2. The initiative

The college through its trained peer educators of the Anti-Aids Club (AAC) in conjunction with the Restless development peer educators conduct sexuality education sensitization meetings in the college among their fellow students and staff (Teaching and non-teaching). They do staff-to-staff and student to student peer education, small group, and large group discussions. Members of staff in-charge of the peer educators and ACC. do this. Some of the topics that are discussed include:

- Teenage pregnancies
- Re-Entry policy
- Family
- Peer pressure in colleges of education
- Virginity
- Coping with situation
- Keeping ourselves health
- Counselling a friend in a crisis
- Making a difference in the college of education

Other activities that are conducted by the Anti-Aids Club as a way of sensitizing other students in the college include role-plays, poems, songs, drama and sketches, and health education days. The group also reaches out to other peer educators at Chimwemwe friendly corners members at Chimwemwe Clinic and sensitization meetings with the pupils at Mindolo Primary School. These activities are spear headed by the Restless development members who come each term to promote the activities to do with sexuality education and other related issues.

3. Other ESD practices implemented in the college

Kitwe College of Education has had some experiences in Education for Sustainable development. These areas have been based on environmental issues, economic and social development. The college aims at providing total education through provision of life and occupational skills. It values learning by doing. The activities of education for sustainable development have mainly come as practical activities through implementation of the curriculum. The activities include the following:

3.1 Advocacy for Environmental Protection and Conservation

There is a Science Education club that advocates for a better environmental that can sustain livelihoods through sound practices. The club covers such topic as:

- (i) Climate change and global warming
- (ii) Organic farming
- (iii) Deforestation
- (iv) Pollution
- (v) Loss of biodiversity

3.2 Sustainable Gardening

Through the Science Education course, the college does offer some practical skills in gardening. The students are taught how to grow vegetables sustainably by embracing practices that ensuring the environment is conserved. These practices include minimum tillage, use of organic fertilizers (animal manure and compost), regular crop rotations, none use of synthetic chemicals, and use of integrated pest management control.



Figure 2. Students harvesting vegetables from the garden for consumption in the boarding hostels.

3.3 Waste Management Control

The college advocates for sustainable waste management control in its surroundings. This is mostly achieved by several means. First, the college practices reuse of wastes. The waste products especially plastics are reused. The students through their various subjects are encouraged to improvise by using plastic ware and convert it to teaching aids. For example in Science Education disposable bottles can be designed to act as beakers, funnels, conical flasks etc. in Expressive Arts, plastics can be converted into works of art. The college also discourages use of disposable spoons and plates. Students are urged to bring their utensils that they can use repeatedly again thus avoiding accumulation of waste.

Second, the college practices compositing of biodegradable wastes. Waste materials that are biodegradable e.g. leaves and kitchen wastes are composed and used in gardening. Third, students are also taught to reduce the use of waste generating materials e.g. they are encouraged to reduce use of plastics in their shopping. Fourth, the college also has a routine programme for Preventive Maintenance where all students are involved. The students are involved in college clean up every Wednesday; here they pick all types of wastes, segregate them in readiness for disposal. Wastes such as organic matter, plastics, bottles, metals and other solids are separated.

4. Vocational skills and corporate social responsibility

The college promotes the development of vocational and life skills and practices corporate social responsibility.

4.1 Vocational skills development

The college believes in imparting practical skills to students that they can later use for social and economic development. The colleges wants it students to have a hands-on experience on what they learn in classrooms. In this endeavour, various sections/departments have practical-oriented sessions to actualize the students learning. The following examples suffice.

In the technology studies department students are taught skills in bricklaying, elements of carpentry and workshop management. The skills learned here can be used in preventive maintenance in schools where they students would serve. Additionally, the skills could also provide extra income to the teachers. Also in this section, from the Home Economics section, there is a component of food and nutrition; here the students are taught on sources of nutrition foods and their importance to the body. The students are exposed to various techniques of food preservation and preparation. Furthermore, the section teaches on Health and Hygiene focusing on good hygiene practices, disease prevention and home management.

4.2 Corporate social responsibility

The college is also cognizant of the social needs of the people it is serving in this front it runs a vibrant social responsibility programme. In order to provide education for sustainable development, the college runs an active bursary programme where viable but vulnerable students are assisted with tuition fees and up keep. The students in turn also assist in keeping the college surroundings clean. In the process, the students also gain various skills.

5. Impacts of the initiative

The initiatives introduced in the college have made a lot of positive impact on both the general students' populous and the public as could be seen from the positive response to ESD and sexuality related situations. Student leaders come in the open to administration and decide how to improve on the morality of the students so that the rate of STIs is reduced. Others just volunteer to do station up-keep, gardening, digging rubbish pits and so on even when it's not the day for such works.

The healthy day events are conducted. This is when the peer educators collaborate with others who do similar activities in sensitizing the students populous and other people in the college catchment area. The main activities conducted on this day include: distribution of flyers and leaflets, conducting counselling sessions, conducting voluntary testing and counselling, distribution of condoms, conducting health talk to students and other participants, open discussion time, and testimony time.

Additionally, it is also time to share ideas on issues that affect young people in the country as a whole. These include peer pressure, early pregnancies, drug abuse and drug addiction and many more.



Figure 3. Students participating in preventive maintenance work.

6. Success and challenges

Nearly all the students and staff get involved especially when the talks are announced in good time. Attendance by most students has greatly improved because the grown ones sometimes used to feel shy and leave before the end.

However, there are some challenges. For example, some guest speakers fail to come and cause panic when they say at the last minute for immediate replacement of either activity or speakers. We sometimes fail to pick the officers especially when they are out of their stations on other official duties.

7. Further ideas

Our plan is that we cast our net wider to involve other colleges within reach both public and private in the health day event so that it becomes big and more effective. The officers from Planned Parenthood, Champ and YMCA are more than willing to be getting involved into the activities of such nature even much more than we do in the near future. It is intended to make ESD and GCED key components of both college and our practicing schools termly activities where both sets of our learners will be participating in.

CASE STUDY 7

MALCOLM MOFFAT COLLEGE OF EDUCATION

PROMOTING EDUCATION FOR SUSTAINABLE DEVELOPMENT THROUGH GENDER EQUALITY AND INVOLVEMENT IN SCIENTIFIC INNOVATION AND RESEARCH

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1. Introduction

Gender equality is fundamentally related to sustainable development and globally accepted as a necessity for the promotion of human rights, economic and social development. Gender equality, also known as sex equality, sexual equality, or equality of the genders, is the belief that everyone should receive equal treatment and not be discriminated against based on their gender. Gender equality is one of the objectives of the United Nations Universal Declaration of Human Rights. They seek to create equality in law and in social situations, such as in democratic activities and securing equal pay for equal work. In relation to gender equality and scientific innovation, ESD is about enabling us to constructively and creatively address present and future global challenges and create more sustainable and resilient societies.

With limited natural resources, individuals and societies have to learn to live together and take responsible actions based on the understanding that actions here and today can have implications for the lives and livelihoods of people in other parts of the world, as well as for future generations. The social and scientific of embracing Gender Equality and Science in ESD means that what they learn and practice in the college will be replicated in the society or communities they live in. The skills acquired at College through research and projects/practicals will help them plan and minimize poverty levels by contributing to both household and national food production, improved nutrition and income generation regardless of sex affiliation. Teacher education should be reoriented to ensure that ESD is integrated into teaching practices, for example through the online course for schoolteachers on climate change education, and integration of learner centred and outcome-based lessons.

2. The college ESD initiative

The college has a deliberate policy and action to promote education for sustainable development through gender equality and involvement in scientific innovation and research. The objectives of gender equality initiative are as follows:

- To acquire, if they so choose, equal treatment throughout a society, not just in politics, the workplace, or any other policy-designated sphere but also in Scientific Innovation and research where the female folk has been marginalized for decades.
- To allow students gain a deeper understanding of gender dynamics and strategies for addressing the different needs and priorities of both genders.
- Increase knowledge about gender concepts and become aware of the latest insights in gender responsive governance issues.
- Identify and implement strategies to increase participation and representation of women and marginalised groups in an organisation or society.
- Improve personal skills in scientific research and problem solving, negotiation, lobbying and action planning for a meaningful change in college and school where they are deployed to.
- Improve gender and diversity awareness amongst themselves in all Science related undertakings.
- Increase awareness on the importance of ecological interactions for sustainability.
- Increase awareness on the importance of ecological interactions for sustainability
- Improve science process skills and interest in science
- Improve biodiversity in the school.

3. Description of the initiative

On implementing the ESD global policy, Malcolm Moffat College has decided to integrate ESD into education plans and curricula through the main farming enterprises it is currently undertaking. It develops ESD tools and materials for decision-makers (administration), teachers and students to contribute to making education relevant for today's world so that learning in schools is linked to real life experience. With the above view in mind, the College's best practice fostering ESD include promotion of gender equality and scientific innovation and research. Gender equality is a topic that is taught to all students in the college. It is a topic in social studies.

The college policy on gender equality allows for both male and female students to be in all elective positions and equally participate in field projects

in Sciences. In the context of college governance, gender equality is critical. Both male and female students face different challenges in full participation, representation in the life college. Measures that ensure equitable access to college leadership positions have been instituted. To make it practical, for example, during the election for different college leadership and committees, it is a requirement that both sexes to be equally represented. The elected members, in this way both genders acquire organizational and management skills, run the committees.

The lecturers and students are involved in the organization of the election. The students do elect their fellow students in different elective positions. The students themselves do daily running of the committees but there are matrons/patrons for each committee who happen to be members of staff for guidance. In the Science cohort, all students are involved in the manufacturing of reagents, models, teaching aids that are supplied to local schools through improvisation and use of raw materials available in the Science laboratories. The College has also seriously embarked on Agricultural Science projects and practicals where students are engaged in farming activities, farm management and Agro business to implement what they learn theoretically into practice.

This programme is designed to contribute to the national food production through research, consultancy and education. All students are involved in research and innovations through laboratory and field practicals and project that are marked or scored by lecturers in the Science section using mark score sheets. Projects and practicals are done in the fields of vegetables, fruit crops, livestock where students according to intakes do all management practices. The best practice so far is the utilization of organic manure in crop production where students compare chemical fertilizers with different farm /organic manure that has produced good results in vegetables (Figure 1).



Figure 1. Vegetables grown by students as part of their learning projects.

Students are researching on the best mixture between maize bran and poultry manure to minimize the use of D compound and urea in fields through student projects and practicals well-decomposed maize bran has performed very well in all crops as a substitute to compound D. A mixture of well-decomposed maize bran and poultry manure has improved crop performance to enable crops reach maturity without even applying urea. The college is also preparing Science and agricultural science lab/ field manual to address all aspects of practicals where topics on value addition will be practically done by students to impart in them life skills. For example processing of Yoghurt, cheese and butter from raw milk from the college farm animals using very simple methods and apparatus. The college is soon purchasing dairy cattle to facilitate this in addition to the beef cattle in the picture below.



Figure 2: A herd of cattle in the college farm.

4. Uniqueness and innovative aspect

The uniqueness and innovation about these initiatives is that it combines the theoretical with practical aspects. The leaders after they are elected are taken for training in leadership skills where the gender equality is a component of the training package. This helps the leaders of various committees to be competent in execution of their duties. This is both formal and extra curriculum, formal since it is part of the topic taught in social studies, Science through involvement of both gender in laboratory and field practicals. It is informal since it is enhanced through co-curricular activities (PU, PMS, sports, Clubs and societies these activities contribute towards the goals of ESD. Figure 3 shows some of the student-involved production activities in the college. Manure from the poultry project is used as biofertiliser in the college gardens and fields.



Figure 3. Student involved in production activities.

5. Impact of the initiative

The initiative is making a difference in the college community. The following are some areas of impact.

- It helps to reduce gender violence.
- It reduces on gender-based discrimination in education that is deep-rooted in differences in society.
- It encourages both women and men to equally participate in Scientific research and innovations
- It reduces in disparities, whether in terms of poverty, ethnic background, disability, or traditional attitudes about their status and role or undermine the ability of women and girls to exercise their rights in all aspects of life.

- It allows extensive and growing participation of women in leadership roles
- It promotes human rights and rights-based approach in the college.
- It allows for equal access to college resources and facilities for both genders.
- It promotes proactivity and offer progressive support to disadvantaged groups (usually ladies)
- It promotes gender socialization or interaction between both genders of different socio-cultural values.
- It promotes Gender equality that also helps break down rigid gender roles that afflict us all. Men will no longer have the pressure of being strong caregivers and protectors and food providers.

Gender equality not only gives women their inalienable rights, but it benefits humanity as a whole. It can help tackle the crippling poverty, illiteracy and abuse that have afflicted nations across the world once provided with valuable knowledge and skills.

Overall, there is high respect for both female and male students and leaders in the college. Female leaders find it easy to supervise both male and female students and they are able to handle any disciplinary case at their level without opposition from their male folks. It has been observed that male and female students carry out challenging tasks equally well; in some case female students perform better than their male counterparts in science projects and practical work.

6. Successes and challenges

There has been a success as seen in the impact it has brought to the college in terms of respecting women in various leadership positions and academic achievement in science projects. Female students are even more motivated and active in Science field projects as compared to some of their male folk. Serenje local musketeers order taste organically grown vegetables produced by students. The college is feeding the boarders on vegetables and green maize from such projects. Female students have been used during district agriculture field days to market and promote their project garden products to the local community. A number of teaching aids have been supplied to local schools through student initiative in science.

The challenges are that the large number of the student makes difficult to monitor the behaviours in relation to gender equality. It is not possible to have all the students in the committees to make the practise of what they learn theoretically. The challenges are that the large number of the students from all intakes and various programmes makes it difficult to monitor the behaviours in relation to gender equality. Marking of projects is also

challenging due to increased number of programmes that is exasperated by long distance to where the college farm is located since the land within the college cannot cater for the increased number of students. It is not possible to have all the students in the committees to make the practise of what they learn theoretically.

7. Further ideas and conclusion

The college intends to renew its partnership with ZAMSEED Company where students will be involved in comparative research activities in vegetable and field crop production every year. Students will be engaged in field trials where crops will be grown using organic manure only. Field days will be held at the college to allow the community learns from such projects as the students promote the different crop varieties . and methods of production used.

Value addition projects such as making cheese, butter and yoghurt from fresh milk will be promoted by students during expos and field days to be organized by the college so that such skills are extended to the community in order to improve nutrition at household levels. The college also intends to adopt the organic method of pest and disease control in addition to the use of organic fertilizers or manure in both vegetable and field crop projects.

ACKNOWLEDGEMENTS

The coordinator acknowledges the members who have contributed to the initiatives contributed in this chapter. They are: Sialombe Sylvester, Simakando Brian Nanyambo, Lukanga Victor, Kamanga Golden, Kabamba Hezekiah, Kalinga Flair, Ndhlovu Duba Musonda, Bwalya Chalwe, Mubiana Mary, Maleka Lawrence, Hachinene, Maxwell Sikwela, Michelo Fenella, and Nyirenda Ruth.

CASE STUDY 8

MANSA COLLEGE OF EDUCATION

PROMOTING ESD THROUGH WASTE, TECHNOLOGY AND EXPRESSIVE ARTS STUDIES

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1. Introduction

It has been said that sustainable development is not an easy concept to define because it is not static hence making it even more challenging to define. However, we can borrow one definition from the Brundtland Commission (1987) that states that sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. One of the challenges that come with sustainable development is the issue of garbage and garbage disposal in such a way that the environment is not compromised for future generations. It is estimated that every day each one of us produces at least 500gm of waste whereas in the developed world, the average output is estimated to be as high as 4 kg per person (Panneetselvam & Ramakrishnan, 2005). Garbage or waste comes in a variety of forms such as plastic materials, tyres, diapers, newspapers, and hazardous waste materials. Plastic materials have been found to pose a very big challenge in as far as decomposition is concerned.

2. The ESD initiative

As a way of promoting ESD principles Mansa College of Education, MACE, has embarked upon a few initiatives. In Technology Studies, the concept of recycling has been adopted in a variety of ways. Students are normally given assignments with emphasis on using 'waste' materials to make various products for example; in 2016 in the third term, students were given an assignment to make test tube racks from discarded wood from within the environment. This as many would agree is one way of recycling materials within the college campus and one way of using resources economically. Figure 1 shows photos of some of the test tube racks made by the students.



Figure 1. Test tube racks made using discarded wood.

Through the Technology club students together with staff have taken the concept of 'Reduce, Reuse, Recycle' by using 'waste' clothes to make place and door mats. When tall grass is cut it is not just thrown away but woven into baskets, place and doormats (see Figure 2). Practices of this kind are ensuring that students are 'provided with the knowledge and skills to promote sustainable development' which ties very well with Target 4.7 of the SDG4 on Education.



Figure 2. Place mats and basket made using waste materials.

With the challenge of paper littering having being widespread, various sections such as Science Education and Social Studies have embraced the skills that Expressive Arts Section has imparted to the students (Figure 3). These sections from time to time takes the initiative to give assignments to students make models such as models of the digestive system, the brain, kidney, life cycle of a butterfly and the map of Zambia.



Figure 3. Students with Mrs Chilambe from Home Economics making place mats.

This is a way of reducing, reusing and recycling the amount of paper as a waste material. Such assignments help to inculcate the culture of always being innovative with the available resources. Models that are made if purchased would cost the college much needed cash for other projects such as construction. This initiative is very important to MACE because as you may be aware it has been reported that paper makes up about 10 per cent of all solid waste materials. This concept of making models from waste paper involves every member of the said sections and all the students (see Figure 4). This practice is helping students to always think 'Reduce, Reuse, Recycle' in their daily lives. This initiative also promotes attitude and behaviour change among the MACE community. Students begin to value waste paper such that instead of burning, which would pollute the environment by releasing fumes into the atmosphere, they safely keep it for future use.



Figure 4. Models made using waste paper.

The concept of 'Reduce, Reuse, and Recycle' is also applied in the making of Waste disposal baskets with some artistic skills. These baskets are made with some aesthetically appealing models for collecting selected waste, especially plastic bottles, in gathering places of the college. The areas where most of the plastic bottles have the greater probability of being thrown anyhow are the tuck shop, graduation podium, and the playing grounds. Aesthetically made wastebaskets are placed in these areas to help collection of the non-biodegradable plastic bottles. As people get attracted to admire the artistic appeal of the baskets they get to realise that the baskets are disposal areas for plastic bottles. This idea at MACE utilizes life-size models of animated waste disposal baskets made using plastic bottles. Here the life-size disposal basket is modelled after a scorpion (Figure 5).

The collection of these plastic bottles is meant to help keep the MACE campus more cleanly and for future use for specific assignments and exercises in several study areas such as Expressive Arts, Science Education and Technology Studies. If these plastic bottles are just littered around the college campus they may end up being burnt and thereby releasing dangerous fumes into the atmosphere. This initiative has been found to be

affecting the college community's attitude and behaviour regarding to plastic bottles. The mind-set has been changing because this initiative from the very beginning involves students as well as college staff mainly from Expressive Arts, Technology Studies and Science Education. The students who are mainly day scholars are also influencing the community in which they live thereby having community participation in tackling solid waste management.



Figure 5. Construction of the main frame of the scorpion model disposal basket.

The construction of the scorpion model disposal basket has done more to promote waste management through ESD due to its artistic appeal. Many people were able to ask many questions during the construction process and as a result, they were able to learn much about sustainable development principles with regard to solid waste management.

The concept of using plastic bottle wastebaskets started with the very basic waste bin as shown in Figure 6.



Figure 6. Plastic bottle wastebasket.

The concept of solid waste management will be extended to making of compost using food remains from the college kitchen. The compost will be used to add much needed nutrients to plants in the college like the banana plantation, the 200 pine trees that were planted in December 2016 (Figure 7). Figure 8 shows the plantation as of February and June 2017. This initiative will involve the full participation of women, the creativity, ideas and courage of the youth as well as the knowledge of indigenous people as outlined in one of the ESD principles.



Figure 7. Students participating in planting pine trees in December 2016.



Figure 8. Part of the pine trees as of February 2017 and June 2017, respectively.

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CASE STUDY 9

MONGU CATHOLIC COLLEGE OF EDUCATION

EDUCATION FOR SUSTAINABLE DEVELOPMENT THROUGH EXPRESSIVE ARTS, TECHNOLOGY STUDIES AND RELIGIOUS STUDIES

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1. Introduction

As Zambia undergoes rapid socio-economic development, Mongu Catholic College of Education is striving to keep up with the national rhythm through promotion of quality educational sustainable development. A number of initiatives from Expressive Arts, Technology Studies and Religious Studies have been instituted and coordinated to help the college achieve its goals. It is from these study areas that deliberate practices in educational sustainable development ESD have helped the institution overcome the challenges faced in many colleges of education such as lack of student requisites as well as teaching and learning resources. The objectives of these best practices are to:

- Enhance effective learning through maximizing competences of the mentioned study areas as tools to education for sustainable development.
- Address the prevailing needs in the area of teaching and learning resources with cheaper and locally available resources.
- Equip and promote improvisation skills to both the lecturers and students.
- Use Expressive Arts, Technology Studies and Religious Studies skills as avenues of income generation.
- Inculcate Christian values of love, peace, honesty, transparency, confidentiality, hard work integrity in the staff and students

Initiatives are very cardinal to the needs of the students, staff, community, the nation and the world at large. According to the Education Curriculum Framework 2013, the Ministry of General Education developed a National Policy on Education of 1996 "Educating Our Future" in order to respond to the developmental needs of the nation as well as those of the individual learners. Therefore, from this point of view, the initiatives mentioned earlier will seek to equip lecturers and students attain skills and values that

promote productivity, resourcefulness and enterprising so that they are able to positively affect the college, the community and the country. Furthermore, these initiatives, equip the students and staff skills to overcome the everyday challenges in an effort to provide effective education that is relevant to the needs of the individuals, the nation and the globe.

2. Detailed Description of the Initiative

Mongu Catholic College of Education has been able to use practices in Expressive Arts Study area to produce teaching and learning resources. These have been improvised from local materials. For instance, discarded water bottles left after meetings have been carefully collected and used as pallets dishes for mixing paints. Further, twigs and animal hair have also been used to make paintbrushes for art lessons. Models in Integrated Science study areas and Home economics, such as the Ear Model and human digestion system have been locally made from paper mash. In the same vein, board rulers and dusters are locally made in Technology Studies. This initiative has not only helped to the college to be self-sustaining in the area of teaching and learning resources but also helped to equip both lecturers and students the skills of improvisation.

The initiatives have also been instrumental in generating income for the college. Paintings, brooms, fabric materials from batik and tie and dye have been made and sold to students, staff and community. The college has also been able to make ceramic wares such as plates, bowls and mug cups. Paintings and crafts such as mosaics, montage, and collage have been sold during local exhibitions within the college. At such functions, students display their talent and sale their products. The participation in the local Agricultural and Commercial shows is also one of the platforms where artefacts have been sold. Instead of the institution spending funds on external artists on sign-writings on college posters, printing of banners or T-shirts on ceremonial occasions and painting educative posters on walls, the Expressive Arts section through the Art Club has been able to carry out these initiatives as a cost saving measure for the college.

The initiatives in Expressive arts have greatly contributed in the provision of working tools to facilitate preventive maintenance systems (PMS) in the college. With the availability of abundance grass in the region, brooms and cobweb removers have been locally made. This has not only helped the college to cut down the cost of buying tools but also provided tools that have helped to maintain clean and habitable learning environments for our students.

Another important initiative through the Technology studies is the rehabilitation of broken furniture. Using the skills from this study area, broken desks, chairs and tables are collected and repaired so that they can still be usable. This has helped to curb the shortage of furniture in the college.

In an effort to sensitize the college community around the college, the institution has used music that is a contributory subject of Expressive Arts to disseminate information on various crosscutting issues such as HIV/AIDS, reproductive health, environmental awareness and substance abuse. These have been done through drama and poetry accompanied with dances and songs. The community has been a target because the institution is within it. Students interact with the community meaning that there is influence on the other. In the same vein, cultural performances have been instrumental in the preservation and education of the traditional norms and values in the college community. Music performances are important initiatives that have helped to raise funds for the college. The administration is supportive through the provision of costumes for the college choir and cultural troupe. Performances have been showcased in the college hall and been available for hire at a fee. Most of the national events in the province, the college choir and culture have championed these by their splendid performances.

Through Religious Studies, as a grant aided institution, the college has deliberate initiatives where every opening and closing of the terms, all students and staff attend mass to recognize the existence of the Supreme God. The local Parish priest offers spiritual guidance and prayers so that students and staff are able to live and uphold Christian values. In addition to this, students take turns every fortnightly according to their denominations to offer devotions and prayers during morning assemblies. This has positively impacted on the college through enhancing of values of life like honest, trust, love, hard work, integrity, confidentiality, transparency to mention but a few. Disciplinary cases like beer drinking, pregnancies, fighting, and improper dressing are almost non-existence at Mongu Catholic College of Education. This has been coupled with the wise counsel from the college management.

The specialized lecturers, support staff and students are involved in these initiatives. The patrons of these clubs supervise the members who are the students in the activities. The college staff work as a unit and time management is given the attention it deserves.

3. Uniqueness and Innovative aspects of Initiatives

The uniqueness and innovative aspect of these initiatives is that they are cheap and cut on costs. This is because raw materials such as grass, paper, and clay are used to make tools and teaching /learning resources. These are obtained locally. They further help the institution to be resourceful and self-sustaining. Learning is improved because students will be able to comprehend concepts in lessons because of the readily available teaching and learning resources.

They also promote creativity in both the lecturers and the students. The students are able to acquire improvisation skills which they will implement

as they go on teaching experience. They will be able to make their own specific teaching aids that they can use in the schools.

The uniqueness and innovative aspect of these initiatives is that they also facilitate the development and promotion of entrepreneurial skills. This helps students to be productive citizens of the nation as they are able to use the competences in Expressive Arts, Technology Studies and Religious Studies as sources of income generation. There must be interest in these initiatives because they help students, lecturers, the institution and the community at large to be self-sustaining so that maximum improved standards of education are achieved.

These initiatives are part of the formal curriculum because they are administered as projects in continuous assessment in expressive arts and technology studies. Usually, students are tasked to work either individually, in pairs or even in groups depending on the type of task. The projects are monitored at every stage so that they are in conformity with what is required and to minimize aspects of cheating. It is a deliberate policy in the college that what the students undertake as projects must be relevant to the prevailing needs at hand.

However, some of the initiatives are undertaken as extra-curricular activities such as college clubs. For instance, Art, Drama, Maintenance, Choir, Culture clubs are also avenues where these initiatives are implemented. Talented and skilled students in the Art club are the ones that do most of the major art works such as sign-writing, printing of posters and banners. In the same manner, the Maintenance club plays a very important role in repairing of college furniture.

4. Impacts of the Initiative

The implementation of these practices has had a positive impact on the students, lecturers, and the community. Students have been able to acquire productive skills that will benefit them even after graduation while lecturers have been able to be independent and self-reliant on making their own teaching aids without relying so much on the administration. The community has also been impacted by these practises. They have been able to buy home utilities and decorations from Expressive Arts and Technology Studies. As such due to the implementation of these, there has been an improved delivery of education due to following reasons:

- Improved delivery of lessons due to localized teaching aids by lecturers
- Effective comprehension of concepts by students
- Reduced expenditure on student requisites by college
- Reduced broken college furniture
- Demonstration of Christian values among staff and students.



Educative Art writings on the wall.



Brooms locally made by students for PMS



Artefacts on display for sell



Water bottle containers improvised as pallets.



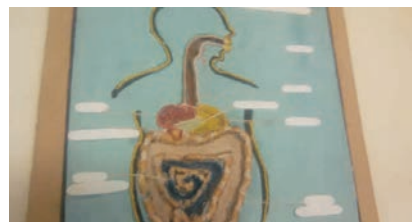
Improved tools from Tech. Studies



College furniture waiting repairs



Furniture in the workshop made by students on sell



Teaching/learning resources for Science made by art students

5. Successes and challenges

There are some successes noted in the implementation of these practices in the college. The most prominent one among them has been the overwhelming support from the college administration. The college management has played a significant role in the continued provision of motivation, encouragement, time and finances. More importantly, the administration has been open to welcome suggestions and ideas that enhance the practices initiated by staff and students.

Another success is the college communities, members of staff and students involved in these initiatives have provided the needed labour at a minimum or no cost at all. There has been teamwork in the implementation of activities with minimum supervision. Furthermore, there has been overwhelming support by community, other members of staff and students in terms of purchasing the art products that have been sold to through these initiatives. Reasonable amount of funds have been raised.

However, there are some challenges that in the implementation of these initiatives. Notably among them is the limitation of time. This is because the key players in the implementation of these initiatives are students and staff. This means that they have to divide their time between their core business and participation in initiatives. Lack of resources has also been another factor that has hindered the implementation of these initiatives. For instance, the renovation of furniture by the Technology Studies requires the procurement of materials such as welding rods, nails wood glue, paints, varnish and so on. The inability or delay to purchase these tools is another challenge.

6. Further ideas

In an effort to strengthen education for sustainable development, the college has collaborated with business houses so that they pledge donations in form of materials and money, or even adopt some structures in the college. The college will sensitise students and lecturers on the importance of taking initiatives that promote education for sustainable development. It will increase the spirit of ownership, responsibility and offer service to the nation without personal gain.

CASE STUDY 10

MUFULIRA COLLEGE OF EDUCATION

LEARNING EDUCATION FOR SUSTAINABLE DEVELOPMENT AND GLOBAL CITIZENSHIP EDUCATION PRINCIPLES THROUGH PREVENTIVE MAINTENANCE SYSTEM

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1. Introduction

The need for education for sustainable development and global citizenship education cannot be over emphasised in teacher training colleges especially now that Zambia and the world as a whole, more than ever before, is in need of empowering learners with knowledge and skills that uphold sustainable development. Sustainable development though subject to various definitions and understandings, is often defined as used by the United Nations Brundtland (1987) to mean improvements that fulfil the current necessities minus tempering with the potential of the future generation to fulfil their own necessities. This suggests that while meeting the current needs is important, it must not be done in such a way that it deprives the future generation the potential to do the same. Therefore, it is inevitable that as much as possible, institutions of learning commit themselves to initiating among learners sense of responsibility in their attempt to meet their current needs so that the future generation is not negatively affected. Education for sustainable development as defined by Higher Education Academy (2014) is “the process of equipping students with the knowledge and understanding skills and attributes needed to work and live in a way that safeguards environmental social and economic wellbeing, both in the present and the future” (p. 5). This means including key sustainable developmental issues into teaching and learning: for example, climate change, disaster, risk reduction, biodiversity teaching and learning methods that motivate and empower learners to change their behaviour and take action for sustainable development. Education for sustainable development consequently promotes competencies like critical thinking, imagining future scenarios and making decisions in a collaborative way.

Arjen Wals (2009) observes that the world keeps encountering, among

others extreme problems ranging from climatic changes that are caused by human action, increased reduction in natural resources, repeated natural disasters, continuous outbreak of infectious diseases, biodiversity loss, human rights violation, a rise in poverty levels, and economic systems highly dependent on an interrupted growth in the idea of using lots of quantities in terms of goods and services. As such sustainable development becomes the answer to this global challenge. This entails that institutions of learning as agents of change, they take up the responsibility to initiate the required change to meet the demands for fulfilling this goal.

2. The preventive maintenance initiative

In response to the above call, the College initiated preventive maintenance in an attempt to develop among learners the spirit of ownership, belonging and maintenance for their environment and surroundings in general. That is to say, students must be aware that the college is theirs and it is from the College that they are deriving the skills and knowledge required of their survival. At the same time, it is the same College that the future generation will be able to equally derive skills and knowledge required for their generation for survival. Therefore, whatever the current students do to earn their livelihood, they must not at all cost compromise the capacity of the future students to successfully benefit from the institution by maintaining it in one way or the other. Examples of the PMS activities are shown in Figure 1, Figure 2 and Figure 3.



Figure 1



Figure 2



Figure 3

Figure 1, 2, and 3. Some PMS activities in the college.

Although generally understood to be a process of routine maintenance of machinery to increase its efficiency and life span, the phrase preventive maintenance in the context of Mufulira College of Education has been used to mean weekly involvement of students and lectures in the cleaning of the classrooms, hostels and college grounds. In this exercise, the College has divided the surrounding into portions which respective classes are expected to collectively clean once a week as shown in the attached schedule.

At the same time, in the case of boarders, on a daily basis the students are expected clean their hostels and on Saturdays they do thorough cleaning which is followed by inspection involving at least the principal or vice principal and a selected group of lectures especially hostel tutors. The results of each weekly inspection are compiled at the end of the term and the best hostel gets an award.

Additionally, in respect of the emphasis for collective involvement in cleaning the environment, the College has strategically placed bins in almost each and every corner of the institution to reduce on the temptation to indiscriminately dispose of waste.



Figure 4: PMS cleaning up activities by students in and around campus.

3. Impact of the initiative

This initiative is particularly important for Mufulira College of Education because it guarantees development of a sense of cleanliness among learners that is necessary for achieving a conducive learning environment. Not only

that, considering that the teacher is the most influential person in the life of the learner, developing skills among students to look after their environment is necessary in creating a sense of ownership of their own environment. This means that once this ownership has been developed at training level, there is a likelihood of these students to uphold it when they have finally been deployed as teachers. 'Old habits die hard' is a common saying which the College is of the view could lead to students promote cleanliness wherever they can be.

Some students have been engaged to work during recess so that there is a tuition waiver on their fees. This has contributed to some students completing the college programme. The surrounding has been kept clean throughout the year.

It is worth noting that because of the human nature, some people would never see the value of doing preventive maintenance, however, in curbing against resistance to participate in this exercise the College has put on the time table this programme (Wednesday: 15:00-17:00 hours) and someone in charge of this so that there is monitoring involved. Not only has that but management from time to time emphasised the need for keeping the environment clean. Furthermore, the College has made available the necessary resources to allow successful implementation of the programme. Most of all, the programme has been a success because of teamwork.



Figure 5. A clean aesthetic college campus.

4. Conclusion

In conclusion, successful implementation of any programme lies in good leadership and sharing the vision of the institution with all the stakeholders and as much as possible strengthening teamwork. As such, Mufulira appeals

to other institutions to take up the challenge of keeping the environment clean through collaborative initiatives and making available necessary tools for realising this goal.

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CASE STUDY 11

SOLWEZI COLLEGE OF EDUCATION

INNOVATIVE TEACHING AND LEARNING WITH POETRY, DRAMA, SONG AND CULTURAL CEREMONIES AND FESTIVALS

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1. Introduction

The Solwezi College of Education initiative for ESD is called 'Innovative Teaching and Learning with Poetry, Drama, Song and Cultural Ceremonies and Festivals'. The aim of this initiative is to reflect on the sustainable development goal number four (4) (SDG 4) on education target, which seeks to ensure that all learners are provided with the knowledge and skills to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development (UN SDGs Report, 2016).

The main objective of the initiative is to actualize target 4.7 of the SDG 4 in our college by increasing capacity in teacher educators and student teachers to integrate ESD concepts and principles in the curriculum and in teaching and learning; illustrating pedagogical principles and processes that should be integrated into teaching and learning for ESD; and strengthening the integration of ESD in curricula and in teaching and learning by teacher educators and teachers who are already practitioners (UNESCO, 2015). The initiative does contribute to human rights, gender equality, sustainable development, culture, global relevance aspects of ESD and/or GCED as spelt out in target target 4.7 of the SDG 4.

2. Description of the initiative

The ESD practices for Solwezi College of Education's initiative for Innovative Teaching and Learning with Poetry, Drama, Song and Cultural Ceremonies and Festivals' in line with the revised curriculum include but not limited to

teaching and learning activities. These activities are crafted to teach learners through humorous strategies.

The college uses special days in a year such as Youth Day, Tree Planting Day, Farmers Day (District & Provincial Agriculture Shows), Teachers' Day, and World Environment Day to sensitize the community through drama, poetry, song and dance performances at public places on various emerging issues such as good hygiene, environmental awareness, climate change, pollution, violence, early marriages, youth unemployment, circumcision, peace and unity in diversity to name but a few. These are some of the ways and ESD platforms through which the College and community interact.

The College conducts CPD programme aimed at closing up the knowledge gap and enhancing the teacher educators' skills base so that they can become competent and successful teacher educators. Under this programme, context-oriented activities such as debate, songs, poetry, drama, cultural dances and motivational talks are undertaken. For example, through debate, members of staff discuss how best to engage student-teachers in debate, poetry, drama and motivational talks to help change their mindsets with regard to greening the college community, reducing the environmental footprint, enhancing food security, using energy efficiently, promoting sustainable life styles and improving biodiversity. The Literacy and Languages Education, science, social studies, technology sections, spearhead this activity. Other groups include Restless group, choir, drama club and the cultural group. The photograph below highlights some of these activities.



Figure 1: Students sharing experiences on sexuality.



Figure 2: Hands and Minds on Greening the Environment Activities.

3. Uniqueness and innovative aspects of the initiative

The initiative is unique and innovative in that it uses special public days platforms in a year such as Youth Day, Tree Planting Day, Farmers Day (District & Provincial Agriculture Shows), Teachers' Day, World Environment Day, etc. This is done to sensitize the community through drama, culture, song, poetry drama, poetry, song and dance performances. These performances focus on various emerging issues such as good hygiene, environmental awareness (climate change and pollution), violence, early marriages, youth unemployment, circumcision, and peace and unity in diversity. Others are linked to extra-curricular activities such as conservation farming, poultry production and preventive maintenance (PMS) to provide knowledge and skills required in attaining education for sustainable development. In implementing all these practices the Japanese Toyota corporation philosophy of kaizen for continuous improvement is applied. Ideas from all stakeholders are taken in account at planning, implementation and evaluation stages to ensure continuous improvement in all that the college does.

It is recognised that education should promote learners' cognitive development, be inclusive and equitable and should encourage learners' creativity and emotional development to prepare them for a rapidly changing world (UNESCO, 2015). The initiative seeks to ensure that all learners are provided with the knowledge and skills to promote education for sustainable development and sustainable lifestyles as specified in SDG 4.7. The initiative is part of the college programme. It is integrated in all the study areas namely science, expressive arts, technology, social spiritual and moral education, literacy languages education and education and profession studies and many other clubs. It has the coordinating committee of ten (10) members drawn from each of the study area, students populace spearheaded by a coordinator. The activities of the initiative such as CPDs are timetabled and they are part

of formal curriculum. Through some of these activities, Students earn marks that contribute towards their continuous assessment to make them effectively participate in most of these activities while staffs are appraised during Labour Day and Teachers' Day awards. The college focuses on quality education attainment through promotion of good practices of teaching using humorous strategies mentioned above. These strategies are crafted with a view to mould motivated, creative and responsive teachers who are able to engage with a new generation of children and young people.

The rapidly changing context and curriculum requires reflective teachers who are able to adapt to new challenges and adopt new approaches and pedagogies such as poetry, drama, songs and cultural festivals.

4. Impacts of the initiative

The initiative is making a great impact in changing the way students, staff and the surrounding college community think about issues of sustainable development, look at things, conduct themselves and do things. For example, the students, staff and college community have appreciated conservation farming as a good practice of farming that ensures that farming on the same piece of land continues without degrading it and have adopted this practice in their real lives.



Figure 3: Environmental conservation in the college.

Carpentry, bricklaying and care for the environment knowledge and skills developed in PMS have transformed most of the students' and staff way of looking at things. Some of the students are using this knowledge and skills (competencies) to be self-reliant for example by engaging in building, repair of college infrastructure and so on. This is happening at Solwezi College of

Education. The podium (Figure 4) and basketball court in the picture are but a few examples of students' participation and contribution.



Figure 5: Graduation Podium Constructed with help of students.



Figure 6. Solwezi College of Education cultural Dance Group sensitizing the community.

5. Success and Challenges

Teamwork, planning, integration of the activities in the formal curriculum and the timetabling of these activities on the college time table are some of the strategies that have made the initiative to succeed.

The college is able to produce students who are creative and flexible and can use knowledge and experience learnt through these humorous learning strategies of poetry, drama, songs and cultural festivals to turn theory into practice. Students to address any problems they will face in future use the knowledge and skills learnt. Therefore, the college uses the methodologies that focus on pupil-centred teaching strategies because they help grounding students' lifelong learning skills. The biggest challenge has been time and overwhelming work on the part of students and staff.

6. Further Ideas

We need to display the practices of the initiative to communities that the college serves such as districts, schools and the province by conducting workshops, drama, and song and dance and so on, so that there is knowledge and skills sharing with the communities. We also recommend that ESD or GCED should be integrated in all the study areas to strengthen it.

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CASE STUDY 12

UNIVERSITY OF ZAMBIA

INVENTORY OF BEST PRACTICES ON EDUCATION FOR SUSTAINABLE DEVELOPMENT

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1. Introduction

Environmental Education at the University of Zambia is considered a means to sustainable development. In this regard 'best practice' means a skill, technique or approach in environmental education that is impressive to the layperson. The University of Zambia recognizes that Education for Sustainable Development (ESD) is a lifelong process from early childhood to higher and adult education and goes beyond formal education. As values, lifestyles and attitudes are established from an early age, the role of education is of particular importance for children. Since learning takes place as we take on different roles in our lives, ESD has to be considered as a 'life-wide process'. It should permeate learning programmes at all levels, including in teacher education.

2. Innovation in learning programmes at degree level

In the Faculty of Education at the University of Zambia, several degree programmes have been designed in response to Zambia's National Policy on Environment (2007), National Policy on Education (1996), the National Environmental Action Plan (1994), and the Environmental Management Act of 2011. These degree programmes include the Bachelor and Masters of Education in Environmental Education, the Bachelor of Arts in Education with specialisation in Zambian culture and ceremonies, the Master of Education in Geography Education, and the PhD in Environmental and Geography Education.

2.1 Innovation in the content of the degree programmes

Innovation in the content includes innovative topics being addressed which range from issues linked to globalization (e.g. human rights and North-South

relations, to healthier lifestyles (e.g. healthy eating patterns) to the more pressing issue of energy consumption and the need for renewable energy. There is a growing concern for extending the concept of sustainable development from essentially environmental to also focusing on social issues. A crucial aspect of the courses is their interdisciplinary character, which is indispensable for seeking solutions to complex problems of sustainable development. The programme integrates theoretical concepts with practical activities and real-life stories. This enables students respond to the challenges in a positive and creative way and elaborate new strategies for anticipating problems.



Figure 1. Teaching models made by UNZA students.

2.2 Innovation in the delivery method

The university encourages innovative ways of delivering the educational process by promoting participatory and interactive learning approaches and the use of technology such as the internet, websites and electronic communication platforms. An innovative pedagogical methodology is set out, encouraging students to undertake 'action research' to identify sustainability issues that are pertinent to the local context in which they operate. The curriculum also promotes first-hand experience with sustainability issues, active participation of the learners, personal reflections and integrated understanding of the natural and socio-economic environment.

2.3 Innovation in forging new partnership and networks

The best practices aim at creating new partnership among national, regional and local actors and communities in order to ensure more participative approaches. This type of innovation facilitates the creation of networks between learning institutions at national and international levels. New working relationships have been established at local, national and international level, and transnational cooperation was created with UNEP, Tongji University and Vice-chancellor of the University of Zambia in early 2013 where an MoU was signed. Strategic partnership to implement strong sustainability and agency in SADC teacher education institutions was established with SWEDESD, Jonkoping University, Belvedere Technical Training College, and SADC-REEP. Further, the first SADC Regional Training Programme (RTP) in Teacher Environmental Education and Sustainability Education was mounted in 2011 where 12 countries participated. One joint outcome publication is entitled “The Parts and The Whole: A Holistic Approach to Environmental and Sustainability Education”.



Figure 2. Participants in the MESA Chair ESD Regional Training Programme.

Figure 3: Consultative meetings for Greening Universities.



There has been active engagement of various stakeholders in EE/ESD through the newly acquired status of Lusaka Regional Centre of Expertise. From April-May 2013, staff and all students of colleges of education were sensitized in EE/ESD through a partnership with the Zambia National Commission of UNESCO. UNZA is an ongoing member of the International Network of Teacher Education Institutions associated with the UNESCO Chair on Reorienting Teacher Education to address Sustainability. UNZA Centrally facilitated the formation and official registration of the Zambian Teacher Education Networks for Sustainability Education (ZATENSE) on 23rd February 2011 whose goal is to promote and facilitate mainstreaming of EE/ESD into Zambian teacher education. UNZA is a member of various networks at local, national and international levels, such as, GUPES, MESA, African Network for Reorienting Teacher Education for Sustainability (AFRITEIS), SADC-REEP, EEASA and ZANEEP.

2.4 Keep UNZA clean campus campaign

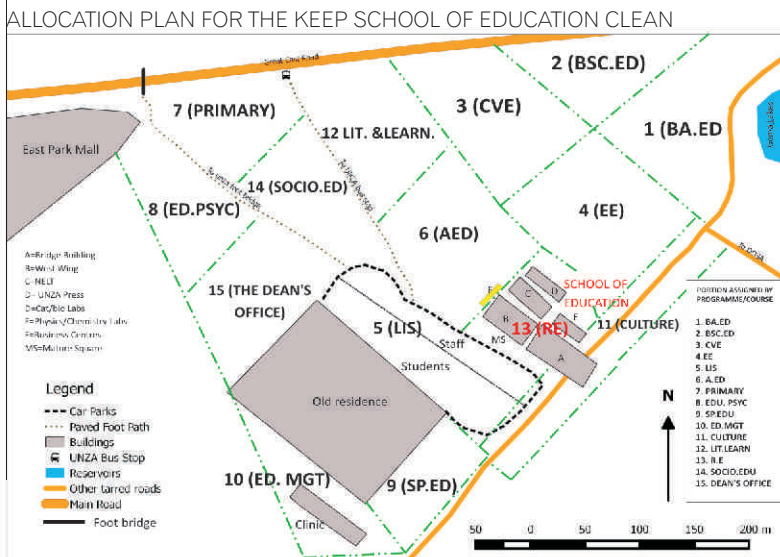
The university officially launched the “Keep UNZA Clean Campaign” on 22nd February 2013. Since then, the University of Zambia Environmental Education Students’ Association (UNZAEESA) has lined up various innovative activities in partnership with EE staff to green the campus. The Environmental Committee in the School of Education allocated its campus space to various stakeholders as shown in Figure 6.



Figure 4: March past at launched of the “Keep UNZA Clean Campaign”.



Figure 5. The Vice-Chancellor launching the “Keep UNZA Clean Campaign”.



Powered by Environmental Committee

Figure 6. Allocation of spaces to stakeholders in the School of Education.

3. Impacts and benefits

Several benefits have accrued over the years. A steady growth of EE from the node (UNZA) to the larger community with the hope of increasing environmental literacies in the process. Students of EE themselves have

started giving positive fruits of their education through their employment and formal attachment programmes. There is increased recognition of UNZA as a leading trainer in new and emerging fields. Importantly, there has been a steady rise in collaboration and partnerships with more institutions in matters to do with sustainability (e.g. government, private, NGOs etc.). The university is recognised as the seat for the Lusaka Regional Centre of Expertise.

4. Further action

The outlook is bright for the University. It is intended to strengthen partnership engagements with like-minded organizations at various levels like UNEP, SWEDESD, SADC-REEP, UNESCO etc. In its approaches, it will continue to seek and implement innovative approaches to tap into the increasing student demand for training in EE/ESD. The University will work with the Greening Universities Toolkit to expand coverage of the MESA Chair. It will continue to incorporate culture into teacher education within the SADC region and to promote change projects through youth and environment sustainability consortium as part of university departmental work.

5. Conclusion

Our vision is a world in which our work and lifestyles contribute to the well-being of all life on Earth. We believe that through education, human lifestyles can be achieved that support ecological integrity, economic and social justice, sustainable livelihoods and respect for all life. Environmental Education processes support and champion education for sustainable development as our programmes have demonstrated over the years.

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CASE STUDY 13

UNIVERSITY OF ZAMBIA

ENVIRONMENTAL EDUCATION COMMUNITY OUTREACH ACTIVITIES

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1. Introduction

The Environmental Education Students' Association (UNZAEESA) has a vision of reaching out not only to other students within the University of Zambia but also to the wider community in Lusaka. The majority of its outreach activities are carried out under the name Umodzi Network. The students carry out extra-curricular community outreach activities as a way of complementing the formal intra-curricular activities they are part of within the university. Outdoor or extra-curricular activities are an effective way of introducing or reinforcing sustainability concepts to a range of learners from children at kindergarten to adults in the community. Outdoor extracurricular activities also have the advantage of being flexibly applicable to people regardless of their education status. This all-inclusive strength of outdoor extra-curricular activities is an advantage the intra-curricular activities do not have.

2. Environmental Education Activities within the University of Zambia

The Environmental Education Students' Association and Umodzi Network embarked on several projects and community outreach activities.

2.1 Poster design

One project involves the design of youth friendly environmental posters to relay various environmental messages to the student populous within campus. Examples are in Figures 1, 2 and 3.



Figure 1: Poster on littering within campus (Umodzi Network, 2012).

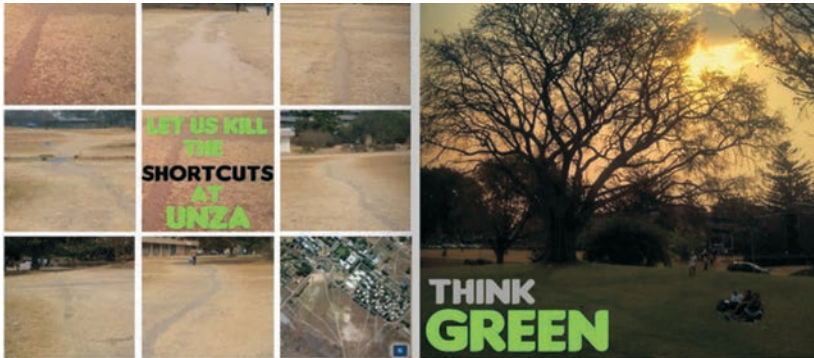


Figure 2: Stopping the use of shortcuts on campus (Umodzi Network, 2012).

WORDS HURT JUST AS MUCH.....LETS STOP VERBAL ABUSE

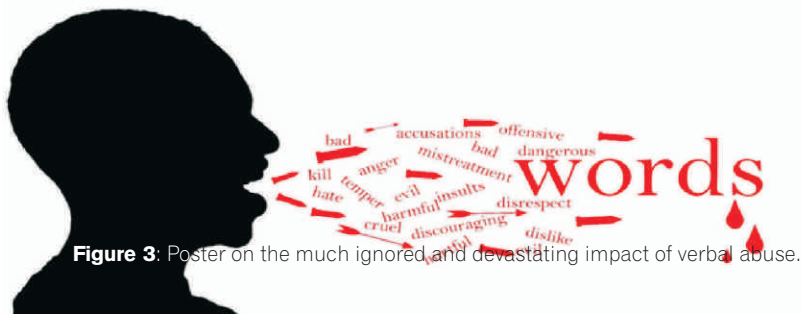


Figure 3: Poster on the much ignored and devastating impact of verbal abuse.

The posters were designed to appeal to the senses and interests of the young and youthful. This was specifically achieved by making the posters visually appealing and linking environmental themes to specific areas of interest for young people such as 'Love'. Love in this case was used as a 'hook' to attract the students to various themes (as seen in Figure 4).



Figure 4: Posters with the theme of 'Love' (Umodzi Network, 2013).

2.2 Community outreach activities

The Environmental Education community outreach activities are carried out in both primary and high schools. Once a school is visited, a number of environmental themes are presented in the form of poems, drama/sketches, PowerPoint presentations and sustainability interactive activities. These activities aim at making sure that different methods of relaying information are used to capture the imagination of the targeted learners.



Figure 5: Umodzi Network members give talks at Chelston High School (Umodzi, 2013) and Kalingalinga Primary School (UNZAEESA, 2013).

Of all the communities that surround UNZA, Kalingalinga is the only densely populated compound. The presence of a high population in this compound poses a number of environmental problems. The Environmental Education students have taken special interest in this particular compound to help resolve some of the pressing environmental problems (see Figure 6) or social issues such as child defilement (Figure 7).



Figure 6. Unveiled environmental billboard in Kalingalinga community (Umodzi Network, 2013).



Figure 7. A poster with a child defilement theme (Umodzi Network, 2013).

In an endeavour to reach out to Kalingalinga community, billboards have been erected to spread various environmental messages linked to child defilement and littering. Some could ask the question, "What does child defilement and verbal abuse have to do with the environment?" In truth, the themes are very much part of the environment. The environment must be viewed as much broader perspective than just trees, rivers and grass-physical surroundings. The environment in a holistic nature includes; the economic, social, political and physical aspects. Hence, child defilement and verbal abuse are part of the social dimension of the environment.

3. Conclusion

Apart from using these outdoor activities as a platform for practising the theory, they learn in classrooms, environmental educators believe that this is an effective way of complementing the ESD efforts that have been made to incorporate ESD in the Zambian educational curriculum. Extra-curricular activities can also be as effective as intra-curricular activities, in helping to mould the minds of Zambian citizens into not only being enlightened but also being environmentally friendly and action-oriented as well.

CASE STUDY 14

ZAMBIA INSTITUTE OF SPECIAL EDUCATION (ZAMISE)

PROMOTING ESD THROUGH COMMUNITY COLLABORATION AT ZAMBIA INSTITUTE OF SPECIAL EDUCATION

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1. Introduction

The Zambia Institute of Special Education has been offering Early Childhood Education (ECE) as far back as 1998. The ECE was a one-year programme for a certificate and later on, a Diploma was offered under Examination Council of Zambia (ECZ). Due to some challenges, for over a decade, the programme was not offered as a course but a subject incorporated into other courses. All activities on ECE were reassigned to University Teaching Hospital Special School. According to the Revised Curriculum Framework for 2013, early childhood care, development and education refers to both non-formal and formal service provision, which prepares children for entry into primary school. It is considered a developmental support for children before the age of six.

2. Early Childhood Special Education

In line with the Revised Curriculum Framework for 2013, Zambia Institute of Special Education is now running a Diploma programme in Early Childhood Special Education. The course is a two-year in-service diploma programme and is holistic in nature as it caters for the major disabilities such as hearing impairment, visual impairment and learning disabilities. This new programme for Early Childhood Special Education prompted the College with the support of VVOB in 2015 to re-introduce a Demonstration Class where students could have hands on experience. The class became fully operational on 16th January 2016 and has total number of fifteen (15) learners. It caters for all the disabilities although currently children with learning disabilities dominate it. The following are the objectives of the programme:

- (i) Empower Vulnerable Disabled Children from townships with quality Special Early Childhood Education and those aged 16 years and above access and acquire training skills.
- (ii) Determine the Psychological and Health well-being of Families and

children with disabilities from Misisi and Kuku townships after provision of food, transport and parents daily involvement in the education of the children.

- (iv) Provides hands-on experiences to trainee teachers, from theory to practice.
- (iv) Empower families with skills, knowledge and values of appreciating their children, regardless of the child's disability and background.

In order to enrol ECE learners, the college follows a systematic process. The college identified 67 persons with disabilities aged 3- 26 in Misisi, Kuku and Chawama townships. Of these 24 reported at ZAMISE for further screening and school placements. Of these, 14 children were under 10 years and the remainder were 16 years or older. The first in-take commenced studies on 16th January 2016. Learners with various disabilities were enrolled in the ZAMISE ECE demonstration class, i.e., hearing impaired (3), cerebral palsy (3), and LD (8). Two more learners have since been added to the LD class. Two Special ECE teachers (student from the first intake of 2013) were employed. One parent was engaged as a caregiver assistant. To ensure proper functioning, the institute provides transport, food, and access to a play park for its learners. Some of the learners are shown in Figure 1.



3. Innovativeness of the initiative

The college is well vested in the area of research and the demonstration class has provided a fertile ground. A student from Zambia Institute of special

education will acquire the basic expertise and skills needed in the professional world and to work as an expert. They will be capable of acting as active citizens and they will be capable of influencing decision-making. They can also keep themselves up-to-date with the innovations and research conducted in their own field. This is consistent with the principles in education for sustainable development.

The Demo class includes innovative ways to forge multi-stakeholder approaches and which creates a sense of ownership among learners, students, lecturers, families, decision-makers and experts, and innovative ways of delivering the educational process by promoting participatory and interactive learning approaches and the use of new technology such as the internet, websites, electronic communication platforms for learning. Innovation in forging new partnerships and networks for the purpose of sharing knowledge and experience, fostering communication and exchange of experiences. The institution exposes lecturers, teachers to exchange visits to other institutions with expertise in Early Childhood Education and the knowledge gained is streamlined to teaching a child with special needs.

The teachers from the Demo class instill the sense of responsibility by integrating economic, social, cultural and environmental components of sustainable development and reflect their interaction and interdependency in their designing for example outdoor activities and implementation of the school curriculum. Innovation in addressing sustainable development with a focus on ensuring a strong interdisciplinary approach in addressing the interrelated social, economic and environmental dimensions of sustainable development. The learner from the Demo Class despite their challenges will contribute to sustained improvement of living conditions.

4. Contribution to goals of education for sustainable development

The Zambian education system has a vision of people committed to living in a sustainable manner. The motivation, knowledge and skills they acquire will be through education and training imbibed with the principle of education for Education for sustainable development. Citizens committed to Education for sustainable development will live in a responsible manner throughout their lives and they will apply the principle of Education for sustainable development whenever devising a new procedure or developing the environment.

The Demo class is in line with the global education agenda in the international Agenda 2030 for sustainable development. Through the Demo class, the Education 2030 Framework for Action has been translated into practice. This shows a real commitment to the principles of sustainable development goals and practices in developing and implementing education policy. At the Demo class, children learn about peace and harmony, and respect for all life and the environment through cooperative games, stories

and outdoor activities. The programme has contributed to revitalizing the institution, community, promoting collaboration and parental involvement.

All the stakeholders are capable of contributing to Goals of Education for sustainable development that satisfies the needs of today's populations through education that is based on an all-encompassing view of a development that takes into consideration the economic, social and environmental factors. The rights of children are defined in the Convention on the Rights of the Child. The Demo class has been developed based upon the CRC. Despite the situations that a child may find him /herself in for example children with disabilities, their rights should not be violated. The interaction with the family members avails them with the information so that the child with special needs are not discriminated.

5. Transforming people's thinking about disability

At the Demo class, sustainable development is achieved through empowering learners to think critically though the activities that they are being given. The disabilities does not deter the teacher from according the learners to have a vision live responsible lives and to address complex global challenges means that education has to promote competencies like critical thinking, imagining future scenarios and making decisions in a collaborative way.

We need to change the way we think and act. This requires quality education and learning for sustainable development at all levels and in all social contexts. This is demonstrated from the Demo class because the institution is able to think outside the box thereby seeking to bridge gaps between different societal actors/sectors and are inclusive, in order to allow new partners to join the implementation process. The stakeholders participating in the well-being of the learners on a voluntary basis will gain a wider understanding of the role of education for sustainable development in the perspective of children with special needs have in building the future. They will be more empowered and their chances of participating in the development of society will improve.

The direct involvement of the students and lecturers with the local communities and population are attempts to educate, inform and enlighten students, lecturers and the local societies about the needs of children with special needs. The interaction of all stakeholders with the Demo class aims at increasing awareness of the interrelationship of children with special needs. Similarly, people should be able to appreciate these children and consider them with a vision to make a difference in their lives. They should also be committed to a sustainable lifestyle and they should feel motivated enough to participate and make a difference. Figure 2 shows some of the teachers engaging with learners.



Figure 2. Teachers engaging the learners.

6. Uniqueness of the programme

The programme is unique. It is part of the whole college. The students are encouraged to undertake action research to identify sustainability issues that are pertinent to the local context in which they operate. The college curriculum also promote first-hand experience with sustainability issues for example active participation of students during the translation of the theoretical aspect of the curriculum into practical aspect.

The initiative is based on a multi-stakeholder approach whereby schools, NGOs and the community group work together in identifying the priority areas to work on. For example, initially there was the Child Find Project to locate the learners. Students' active participation and cooperation with their lecturers and the local populations contribute to their active involvement in specific issues concerning children with disabilities in their country, approaching these issues through different perspectives, sensitizing the communities and enabling them to take action concerning these children's needs through communication and interaction. The involvement of the local community has promoted cooperation and interaction amongst students, teachers and the local populations. In addition, it is important the institution through the programme has the opportunity of networking with various target groups dealing with early childhood education.

Students are the key recipients of the knowledge and skills imparted from the learning process and subsequently, students will then be the key transmitters of these ideas and principles. The students from Zambia Institute of Special Education upon graduation go on to become leaders in

their communities and help to change the mind-sets of individuals on children with disabilities whose rights are trampled on in communities. These individuals educate teachers in schools as well as community members who play the most important role in shaping the future of the child with special needs. Second, they actively contribute to the societal development through outreach and service to society. Figure 3 shows a photograph when the Belgium Parliamentarians toured the Demo Class with courtesy of VVob.



Figure 3. Belgium Parliamentarians on tour of the Demo Class courtesy of VVob.

6. Impact on the institution

The initiative has had positive impact on the institution and has substantial pay off for the community. The following are examples of the impact.

- There is hands on training for the students there by attaining;
- It has enabled the student to create confidence in Early Childhood Education drawing the picture from the former students who are offering their services at the Demo clas;
- It has created linkages with other stakeholders especially those with the inclination with Special Education hence creating Networks with the institution;
- There is collaboration between the community and the institution for example termly meeting to discuss the affairs affecting the running of the Demo class; and

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- It has created economic empowerment to the Assistant Care Giver from the Community helping with the upkeep of the class.

7. Conclusion

This good practice and shared experiences, from Zambia Institute of Special Education is a concrete example of successful implementation of Education of Sustainable Development in the education sector. It is strongly acknowledged that that ZAMISE as an institution bears the responsibility to increase the awareness, knowledge, skills, and values needed to create a just and sustainable future. This good practice will assist different stakeholders in their efforts to implement education for sustainable development and fosters the sharing of experiences between different instructions of Higher learning in Zambia.

ACKNOWLEDGEMENTS

ZAMISE acknowledges VVOB for being very instrumental in the successful implementation of the programme. In addition, the college is grateful to all cooperating stakeholders for the establishment of the Demo class. It is proud of its lecturers and students who have worked tirelessly so that the project Child Find took off.





Education for Sustainable Development (ESD) in Teacher Education Institutions: Case Studies of Best Practices in Zambia
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About the Book

This book is a compilation of case studies on best practices in education for sustainable development in teacher education institutions in Zambia. It contributes to the dissemination of the best practices among the institutions and the wider society. It adds to examples of practices that are relevant to the UNESCO Global Action Programme on Education for Sustainable Development (GAP).

The project was coordinated by Professor Overson Shumba at the Copperbelt University in Kitwe and Heather Munachonga, Programme Officer at the Zambia National Commission for UNESCO in Lusaka. The book was made possible with funding and support from UNESCO, Paris, the Ministry of General Education, the Copperbelt University, and the Zambia National Commission for UNESCO. All the institutions were supported by the teacher education institutions and their partners.