Teachers' Conception of Education for Sustainable Development: A Case of Secondary School Teachers in Gweru Peri and Urban, Zimbabwe

Mukoni M.
Faculty of Education
Midlands State University
Gweru, Zimbabwe

Abstract

The purpose of the study was to assess the teachers' conceptualisation of Education for Sustainable Development (ESD). This was an exploratory study whereby a questionnaire was administered to 80 teachers teaching different subjects in the secondary schools in Gweru peri and urban. The questionnaire was divided into three sections namely: demographic data, conceptualisation of sustainability challenges, methods and processes of ESD and ESD related capacity building received by the teachers. Questionnaire contained closed and open ended questions. Data from closed ended question was analysed quantitatively using descriptive statistics which included calculation of percentages, while content analysis was used to analyse data obtained by means of open ended questions. Results showed that the majority of teachers had a general knowledge of the sustainability challenges. It seemed, however that there is no clearinghouse to the teachers' conception of these challenges, as shown by the ratings of issues which seemed to vary according to category and locality. Environmental sustainability challenges were rated higher than economic, social and political challenges in that order. Environmental challenges not common in Zimbabwe were also, rated lowly as compared to those locally experienced. Results also showed that although sustainability topics in the curriculum have increased to include social, political and economic related topics which span across different subjects rather than limited to science subjects, they are still taught as compartmentalised issues according to the subject domains This shows that the interdisciplinarity of ESD is not fully, implemented, conceptualised and practised because if it was implemented there would be a common teaching of the issues across the disciplines. Interpretation of the results also indicate that there is little and unsystematic effort put to equip teachers with ESD skills hence the paper suggests that deliberate effort at national level be done to in-service teachers otherwise ESD will continue to face marginalisation and compartmentalisation in the school curriculum.

Key words: *Conceptualisation, Sustainable Development. Education for Sustainable development; Interdisciplinary teaching*

Introduction

Education for Sustainable development was originally perceived as education about sustainability. It was through the influence of Agenda 21 and the World Summit

on sustainable Development (WSSD), that ESD has increasingly been recognised as more than dissemination of knowledge about sustainability, but, rather as a process of adaptive management and systems thinking requiring creativity. Some societies emphasise environmental aspects, for example, Peden (2008), is concerned that integration of the social, economic and physical aspects may de-emphasise the environment. On the other hand Collins-Figueroa (2008) shows that an emphasis on the environment is a limitation as the socio-political frame in which the environment is situated is sidelined. In the same vein Sterling (2004) , argues that environmental problems are not self contained, but are a critical and integral part of the sustainability imperative which is concerned with the well being and longevity of interlocking human and natural ecosystems. The author identifies most closely with Hopkins (2008) 'view of ESD as an integration of concepts of human development, social development, economic development and environmental concerns in a holistic and interdisciplinary way.

ESD should provide communities with skills, perspectives, values and knowledge to live in a sustainable manner(Pigozzi,2003), thus calling for methods such as projects and practical actions, action research, community problem solving, participatory research methods, field work, collaborative research methods, case studies and exploring indigeneous ways of knowing as well as local inquiry about the issues.ESD is therefore not education as usual, but, a change away from subject bound teaching in the classroom walls whereby educational efforts are geared to change the learner's behaviour which can be achieved through deliberative methods like drama and theatre for development, storytelling or experiential methods like music, poetry, role play and values clarification among others, so as to create a sustainable future in terms of environmental integrity, economic viability and a just society. This implies that sustainability education is not limited only to cognitive aspects. which can be achieved through methods such as talks and presentation, demonstrations and experiments, guided questioning, fieldtrips/ excursions and exchange visits, games and quizzes, but, it involves challenges, behaviours, attitudes and intentions, as well as the ability to feel bound to human community. Dale and Newman (2005) adds that practitioners teaching sustainable development related programmes should incorporate an interdisciplinary approach and allow for problem based applied learning.

ESD therefore, suggest a learning process through which, contrary, to the traditional fragmented curricula, the issue of water pollution for example, can be approached in an integrated way by all disciplines in the school. The science teacher can investigate the water quality by carrying some tests on the water, coming up with water audits and interpreting the results. A history teacher can investigate the cause of water pollution, while language teachers can use the same issue to develop writing skills

by instructing students to write a report or a letter to responsible authorities about the issue. The English teacher can also use the issue in a comprehension test or a debate to help learners develop particular language skills rather than gaining knowledge about the environment. A maths teacher can use the water audits prepared in science lessons to teach about graphs as well as some statistical calculations. Art students can make posters for example to raise awareness about water pollution while the agriculture teacher can join with geography and science teachers to look into the effects of agricultural inputs such as fertilisers and herbicides on water pollution. The commerce teacher on the other hand can use the same issue of water pollution to teach about advertisement, for example of technological gadgets that reduce water pollution. Such an approach is called interdisciplinary teaching. It is essential as it enables multiple dimensions that is, the social, economical and physical aspects of the phenomenon to be better examined and understood. This is called interdisciplinary, systemic and holistic way of teaching. (Liarakou and Flogatis, 2007).

ESD is more participatory in that it aims not only for understanding of issues of sustainable development but also enables learners and educators to cope and act upon the inter-discliplinarity of the environmental issue (Pigozzi, 2003). It is therefore, information driven and a participatory concept that allows learners and educators to interact, dialogue about environmental, political, social and economic issues that affect them on a daily basis. It develops knowledge, skills, perspectives and values to participate in improving the quality of life by individuals and groups. This implies that there are nuanced differences in the definition of ESD which will depend on the local context, priorities and approaches (ibid). The goals, emphases and processes of ESD must, therefore, be locally defined meeting the local environment, social and economic conditions in culturally appropriate ways. This can only be realised through community involvement which will enable people to make informed decisions on issues affecting the quality of their lives and exchange of relevant experiences and sustainable solutions. This is supported by Tilbury (2011) who acknowledges that ESD calls for processes of collaboration, dialogue and engagement in the whole system. This implies that teaching for ESD should support processes which build collaborative and learning partnerships across all social sectors, which are the subject domains, the community and the international globe.

While it is generally agreed that sustainability education must be customised for individual learners (Huckle and Sterling, 2006), approaches of ESD encourage people to understand the complexities of, and synergies between the issues threatening planetary sustainability at the local and global level in order to understand and assess their own values and those of society in which they live in the context of sustainability. This can be realised if interdisciplinary approaches that integrate concepts and analytical tools from a variety of disciplines are employed

in the school curriculum. Peden (2008) subscribes to this notion by observing that the knowledge needed to address a community's problems did not lie in any discipline, if the main site for learning becomes the community, then learning in discrete disciplines will yield to a more cross-disciplinary approach.

ESD seeks to engage people in negotiating a sustainable future, making decisions and acting on them. For this to be achieved it means ESD must develop the following learning outcomes: critical reflective thinking; understanding of complexity(systems thinking);planning and managing change; understanding interrelationships across disciplines; applying learning to a variety of life wide contexts; decision making in uncertain situations as well as in democratic ways; negotiating and consensus building. Tilbury and Wortman (2004) identified five skills as being essential to ESD namely: envisioning; critical thinking and reflection; systems thinking; building partnerships and participation. This assertion also shows that communities of practice are essential in ESD. These communities of practice can be established at different levels starting with the learners and teachers being engaged in some form of dialogue, between subject teachers as they use inter disciplinary approaches, between the school and the community through community engagements or through ESD teacher networks up to the global level. Although there are variations in the definition and understanding of ESD It is important to note that education and learning for sustainable development cannot exclude the interconnections between the environmental, social, economic and cultural aspects of sustainable development and a suitable mix of teaching methods.

The power of Education to enable a radical change in the way in which we live was long acknowledged by the United Nations. The role was popularised by the work of the 1987 Brundtland report. The following excerpts illustrate this:

...In particular the commission is addressing the young. The world's teachers will have a central role to play in bringing this to them (Our Common Future 1987)

....the world's teachers have a crucial role to play in helping bring about the extensive social changes needed for sustainable development (Brundtland, 1987 p. Xiv)

...we will make sure that education programmes reflect the ethic for living sustainable (IUCN, UNEP, WWF 1991, p 5)

The centrality of the role of education gathered momentum at the Rio conference in 1992 through chapter 36 of Agenda 21(Ogbuigwe2006) It was at this forum that education was deemed critical for promoting sustainable development (UNCED

1992, chapter 36, p2) and also, at the World summit on Sustainable Development (WSSD) where education was identified as a critical intervention for furthering the goals of sustainable development. The minister of the Environment from UNECE region on ESD in IUCN (2002) acknowledges that education apart from being a human right is a prerequisite for achieving sustainable development and an essential tool for good governance. This realisation of the importance of education influenced the United Nations General Assembly which in turn led to the adoption of resolution 57/254 which landed in the declaration of 2005 to 2014 as a United Nation Decade of Education for Sustainable Development (UNDESD). Ekosse (2009) subscribes to these views by purporting that the key to guarantorship of sustainability is education. The principal aim of DESD is to promote changes in approaches to education so as to integrate the principles, values and practices of sustainable development into aspects of education and learning towards environmental integrity, economic viability and a socially just society for the present and future generations (UNESCO, 2005). These views illustrate that teachers need to reorient their approaches to the curriculum especial their teaching methods so that societies can move towards sustainability.

While much faith has been placed on the teachers, they also face poor understanding of the concept Education for Sustainable Development (ESD).The midterm UNESCO draft review on the Decade of Education for Sustainable Development identified ten critical areas of concern as priorities if the efforts of the decade are to be fast tracked (UNESCO, 2009) Among the critical areas was awareness, meaning and scope of education for sustainable development. It is against this knowledge gap that this study was conceived. The purpose of this study was to examine the teachers in Zimbabwean secondary schools' conceptualisation of Education for sustainable development, the argument being that as the Decade of Education for Sustainable Development (DESD), draw to a close, there is need to identify areas that still need attention.

Zimbabwe being a signatory to Agenda 21, the Rio declaration and many other conventions is committed to the decade of education for sustainable development as reflected by its initiation of various innovations that included redesign of curricula such as introduction of the life skills programme(HIV/AIDS education) in schools and colleges, civic education, continuing education(adult education),decentralisation and empowering of local communities, poverty alleviation strategies through management of natural resources, technical and vocational education, information and communication technology policy, crafting of the national environmental policy in 2003.The government committed itself through this policy whereby one of the goals reads as follows: *To make sustainable development a national priority, to take a proactive role in environmental issues and to respond to environmental challenges facing Zimbabwe at the personal, local, national, regional and global level through education and communication*

Many studies have also been done on teachers' conception of education for sustainable development. Bernardino (2000) explored tertiary teachers' understanding of the theory and practice of ESD in southern Phillipines.The study revealed poor conceptualisation of the concept as evidenced by the contradictions between the concept ESD as environment and development and environment versus development. Summer, Corney and Childs (2004) researched on the post graduate students' conception of ESD.The study focussed on geography and science student teachers starting the University of Oxford post graduate certificate in education. Study revealed that large numbers of students recognized the centrality of environmental factors as features of sustainable development followed by economic and lastly social factors. The study also revealed that geographers highlighted all the three factors more than the scientists. Corney (2006) researched on the tensions and challenges faced by geography student teachers in their learning to teach ESD in English secondary schools. The main areas of challenges reported by this study ranged from the complexity of the subject matter to teaching and learning processes and strategies. Mwaura (2007) investigated the awareness of teacher trainees and their trainers of ESD at the Catholic university of Eastern Africa. The study reported an average understanding of the concept by both lectures and trainees, teacher training was found to be fairly conformed to ESD processes and methods as issues were tackled as independent units with studies being merely theoretical or lecture hall based, no elaborate programme of community service for students and no in service courses for lecturers on ESD.

Qablan, AL-Ruz, Khasawneh and Al-Omari (2009) investigated the attitudes and classroom practices of environmental science faculty members in Jordanian universities to establish whether ESD practice was liberating or indoctrinating. The results indicated that environmental science faculty exhibited a moderate level of attitudes towards ESD, although their methods hinged on indoctrination. The study suggested the need for special training courses and workshops, and the building of learning communities to enhance the pedagogical knowledge and advance the awareness, attitudes and pedagogical knowledge that relate to ESD of members. Özgül (2011) determined the views about sustainable development and sustainable schools of Preservice science teachers before being involved in studies related to sustainable life. Findings revealed first limited words in the definition of sustainable development but reported an increase in the number of words used to define sustainable development after the teachers have been involved in the studies related to sustainable life. Thus announcing a point of departure, from this study, which focuses instead, on the situation as it obtains in Zimbabwe by practicing teachers not prospective teachers and all teachers teaching any subject at the secondary school level were involved instead of teachers of specific subject domains.

Among the existing literature on the conception of teachers of ESD many of the published researches were done in more affluent regions and these focussed more

on tertiary teachers or trainees as shown by non existence of studies of teachers' conception of ESD at the secondary school level and in developing countries, hence the need to assess to what extent practising teachers in secondary schools have conceptualised and responded to the ESD initiatives in Zimbabwe. Although contributing to teachers' awareness about education for sustainable development, this paper also adds a slightly different perspective to the previous studies that have often focussed their attention on teachers within specific environmentally focussed disciplines. In contrast the present study acknowledges that issues of sustainability need to span the whole range of subjects by enquiring conception of ESD by teachers of any subject not science or environmentally related subjects. This study was, therefore, guided by the following research questions:

i. Do teachers have knowledge about environmental and sustainability challenges?

ii. Are the methods of teaching used by teachers compatible with Education for sustainable development methods and processes?

iii. What ESD related training have the teachers at secondary school level received?

Methodology

A mixed method approach was used to gather both quantitative and qualitative data. This was done by including open ended and closed ended items in the questionnaire. Close ended items yielded quantitative data while open ended items yielded qualitative data. This approach was chosen because it allowed detailed and specific data to be obtained that could not be gained from the statistical tests alone or from narrative descriptions. Gweru is the third largest city located in the central province of Zimbabwe known as the Midlands province and is the capital city of the Midlands province. It is the city near the centre of Zimbabwe at $19^{o}\,25^{1}$ S and $29^{o}\,50^{1}$E Secondary schools in this district can be classified into the following categories: boarding government schools, day secondary schools and church boarding schools. As a central province, Midlands was chosen as the research locale based on the assumption that it is likely to have a pool of teachers who graduated in various teacher training institutions across the country, thus giving a representative and better picture of the nature of training given to these teachers in relation to ESD.

This study targeted all secondary school teachers in Gweru peri and urban. Sampling criteria used was stratified sampling followed by judgemental and simple random sampling. Schools were first of all categorised into urban and peri urban schools. In each of the category the schools were further stratified as boarding and day secondary schools. Judgemental sampling was then used to eliminate certain schools. All schools

whose teachers participated in the pilot test of questionnaires were left out. The remaining schools were then written on pieces of paper which were then placed in small boxes. Four separate boxes were created as follows: urban boarding schools, urban day secondary schools, peri urban boarding schools and peri-urban day secondary schools Selection from the boxes was then random. Pieces of paper were picked one at a time without replacement from each box. The process was repeated for urban schools to get the required number of schools from this stratum. All in all 6 secondary schools participated in the study. 4 of the schools were in Gweru urban and 2 in the peri-urban. A total of 80 teachers of different subjects participated in the study. They were science teachers (20%), commercial teachers (11.25%), language teachers (16.25%) and practical subject teachers (20%) arts and humanities (32.50%).

Questionnaire intended to find out the teachers' conception of ESD was designed by the researcher and it consisted of both open ended and close ended item. Questionnaire was chosen because it allowed for uniformity as standardised responses on the teachers' conception of ESD were gathered from a large area within a short space of time. The questionnaire also enabled gathering of data which is not influenced by the researcher's personal attributes thus contributing to the reliability of the data. Again the questionnaire repeats the same questions with different respondents which guaranteed reliability of the responses. The questionnaires were pilot tested with 4 teachers 2 of them from the urban secondary schools while 2 of them were from the peri-urban secondary schools and these teachers were used also as a criterion to exclude their schools from the final sample of schools. Questionnaire consisted of three sections. The first section required the teachers to give their demographic profile to provide a description of the sample involved in the study. The demographic variable of interest to the study was the subject taught; Second section required the teachers to rate sustainability challenges faced in Southern Africa as identified by Lotz-Sisitka et al (2006) to assess the teachers' conceptualisation of education for sustainable development. Section C was meant to assess the compatibility of the teachers' methods and practices with ESD methods and processes as identified by Rosenberg, O'Donoghue and Olvitt (2008). For details on the sustainability challenges and methods see tables 1 and 3 respectively. The section also probed on the type of ESD related capacity building received by the teachers.

Permission to carry the study was sought from and granted by the Provincial Director resident in Gweru Education offices. Once permission was guaranteed the researcher went to the selected schools. The researcher introduced herself to the school heads before data collection from the teachers. Questionnaires were self administered to facilitate a 100% return rate (Cohen and Manion 2010) and this was done during tea break when all teachers were free giving every teacher a chance to participate. Before handing the questionnaire to the teachers the researcher explained to the participants the purpose of the study and encouraged them to read the statements carefully

before filling in the questionnaire. The participants were also ensured confidentiality and anonymity as findings were to be reported in such a way that a group perspective is reported not individual schools. The questionnaires were self administered to the selected secondary school teachers. A total of 80 teachers participated in the study.

Results and discussion

The study generated quantitative and qualitative data. Qualitative data was analysed using narrative descriptions and content analysis, while quantitative data generated by the study was analysed using descriptive statistics which involved calculation of percentages.

Teachers' conception of sustainability challenges

To determine the teacher's conceptualisation of Education for sustainable development, question 6 was included in the questionnaire. Question 6 required teachers to rate the issues so as to show how agreeable they are for the challenges to be classified as sustainability issues. Table 1 below summarises the findings.

Table 2: Teachers' conception of the challenges as sustainability issues (N=80)

Issue	SA	A	N	D	SD
Global warming	42(52.5%)	28(35%)	10(12.5%)	0(0%)	0(0%)
Climate change	35(43.75%)	43(53.75%)	2(2.5%)	0(0%)	0(0%)
Land degradation	38(47.5%)	24(30%)	15(18.75%)	3(3.75%)	0(0%)
Water pollution	35(43.75%)	20(25%)	24(30%)	1(1.25%)	0(0%)
Air pollution	29(36.25%)	39(48.75%)	8(10%)	4(5%)	0(0%)
Waste management	49(61.25%)	24(30%)	7(8.75%)	0(0%)	0(0%)
Drought	28(35%)	21(26.25%)	24(30%)	3(3.75%)	4(5%)
Wildlife depletion	30(37.5%)	44(55%)	4(5%)	2(2.5%)	0(0%)
Inadequate sanitation	56(70%)	14(17.5%)	10(12.5%)	0(0%)	0(0%)
Floods	7(8.75%)	34(42.5%)	24(30%)	11(13.75%)	4(5%)
Depletion of fisheries	22(27.5%)	31(38.75%)	13(16.25%)	6(7.5%)	8(10%)
Low valuing of education	10(12.5%)	21(26.25%)	30(37.5%)	17(21.25%)	2(2.5%)
Lack of self sufficiency	4(5%)	9(11.25%)	43(53.75%)	8(10%)	16(20%)
Fossil fuel and nuclear energy use	12(15%)	14(17.5%)	32(40%)	16(20%)	6(7.5%)

Uncontrolled urban development	16(20%)	22(27.5%)	20(25%)	15(18.75%)	7(8.75%)
Land use conflicts	9(11.25%)	14(17.5%)	21(26.25%)	17(21.25%)	19(23.75%)
Hiv/aids	34(42.5%)	20(25%)	17(21.25%)	7(8.75%)	2(2.5%)
Poverty	16(20%)	20(25%)	14(17.5%)	18(22.5%)	12(15%)
Disease e.g. malaria	14(17.5%)	27(33.75%)	19(23.75%)	12(15%)	8(10%)
Gender inequality and discrimination	28(35%)	21(26.25%)	24(30%)	4(5%)	3(3.75%)
Child abuse	23(28.75%)	29(36.25%)	16(20%)	9(11.25%)	3(3.75%)
Deforestation	15(18.75%)	9(11.25%)	31(38.75%)	13(16.25%)	12(15%)
High illiteracy rate	22(27.5%)	18(22.5%)	18(22.5%)	16(20%)	6(7.5%)
Street children and orphans	21(26.25%)	23(28.75%)	16(20%)	13(16.25%)	7(8.75%)
Juvenile crime	9(11.25%)	29(36.25%)	26(32.5%)	11(13.75%)	5(6.25%)
Teenage pregnancies	28(35%)	14(17.5%)	21(26.25%)	10(12.5%)	7(8.75%)
Unemployment	30(37.5%)	14(17.5%)	17(21.25%)	4(5%)	15(18.75%)
Food insecurity	23(28.75%)	14(17.5%)	19(23.75%)	10(12.5%)	14(17.5%)
Land tenure systems	15(18.75%)	26(32.5%)	28(35%)	5(6.25%)	6(7.5%)
Structural adjustment	34(42.5%)	23(28.75%)	17(21.25%)	4(5%)	2(2.5%)
Inadequate housing	14(17.5%)	16(20%)	14(17.5%)	19(23.75%)	17(21.25%)
Corruption	17(21.25%)	24(30%)	15(18.75%)	16(20%)	8(10%)
Poor governance	19(23.75%)	22(27.5%)	25(31.25%)	5(6.25%)	9(11.25%)
Lack of political will	33(41.25%)	20(25%)	16(20%)	7(8.75%)	4(5%)
Inefficient planning for rural and urban areas	9(11.25%)	14(17.5%)	30(37.5%)	12(15%)	15(18.75%)
Failure to implement policies	8(10%)	7(8.75%)	36(45%)	18(10%)	11(13.75%)
Globalisation	15(18.75%)	27(33.75%)	21(26.25%)	13(16.25%)	4(5%)
TOTAL	**849**	**819**	**727**	**324**	**236**
MEAN	**22.95**	**22.14**	**19.65**	**8.76**	**6.38**

Key: SA-strongly Agree; A-Agree; N-Neutral; D-disagree; SD-Strongly disagree

Compatibility assessment of the methods of teaching used by teachers with ESD methods and processes

To ascertain whether the methods used by the teachers were compatible with ESD methods and processes questions 7, 8, 9, 10 and11 were included in the questionnaire Question 7 required teachers to list all the issues from question 6 that are covered in the syllabuses of the subjects they teach, while question 8 required the teachers to identify other subjects where the same concepts are taught. The idea of the questions was to lead to an assessment of how compatible are the methods and practices of teachers with ESD methods and processes. Table 2 below summarises the findings.

Table 2: sustainability concepts in different subjects of the secondary school curriculum

Subject	Sustainable concepts in the syllabus	Other subject area where the concepts are taught
Science	Nuclear energy use, fossil fuels, diseases ,e.g. malaria ,HIV/AIDS, water pollution , deforestation , global warming , air pollution ,waste management, land degradation	geography
geography	Globalisation ,drought ,floods, depletion of fisheries ,global warming, wildlife depletion ,climate change, fossil fuel and nuclear energy use, deforestation, uncontrolled urban development ,land, water and air pollution, poverty, food insecurity ,waste management	Science Economics Agriculture
History	Land conflicts ,implementation of policies ,land tenure systems,	Geography
Home Economics	Gender inequality ,HIV/AIDS ,child abuse ,water pollution ,waste management ,deforestation ,inadequate sanitation ,energy use ,poverty ,food insecurity	Science Guidance and counselling
Shona	Hiv/aids Child abuse, street children , teenage pregnancies , drought	Geography Science Religious studies
English/English Literature	All in poems and comprehension stories	
Building studies	Uncontrolled urban planning for rural and urban areas	Geography
Agriculture	Land degradation ,water pollution ,drought, deforestation	Geography and science
Religious and moral education/Divinity	Street kids, child abuse teenage pregnancies , Hiv/Aids	Science Guidance and counselling.
Management of business(M.O.B)	Globalisation ,structural adjustment, unemployment	Geography history

Question 9 required teachers to indicate how often they have used the different methods in the teaching of the identified sustainability challenges so as to assess whether their methods are compatible with ESD methods and processes. Table 3 below summarises the findings.

Table3: Teachers' rating of the frequency with which they use the teaching methods (N=80)

Method	VO	O	R	NU
Project and practical action	5(6.25%)	16(20%)	39(48.75%)	20(25%)
Action research	1(1.5%)	3(3.75%)	5(6.25%)	71(88.75%)
Community problem solving	1(1.25%)	8(10%)	11(13.75%)	60(75%)
Exploring indigeneous knowledge	1(1.25%)	3(3.75%)	9(11.25%)	67(83.75%)
Fieldwork	4(5%)	7(8.75%)	12(15%)	57(71.25%)
Case studies	14(17.5%)	10(12.5%)	27(33.75%)	29(36.25%)
Nature-oriented hands on	4(5%)	9(11.25%)	16(20%)	51(63.75%)
Awareness &conservation campaigns	15(18.75%)	12(15%)	37(46.25%)	16(20%)
Local inquiry about issues	4(5%)	9(11.25%)	13(16.25%)	54(67.5%)
Dialogue	14(17.5%)	12(15%)	7(8.75%)	47(58.75%)
Debates	29(36.25%)	17(21.25%)	23(28.75%)	11(13.75%)
Problem solving	17(21.25%)	26(32.5%)	18(22.5%)	19(23.75%)
Drama and Theatre	4(5%)	3(3.75%)	7(8.75%)	66(82.5%)
Talks and Presentation	47(58.75%)	19(23.75%)	14(17.5%)	0(0%)
Collaborative research	3(3.75%)	8(10%)	11(13.75%)	58(72.5%)
Demonstrations	40(50%)	17(21.25%)	21(26.25%)	2(2.5%)
Story Telling	10(12.5%)	5(6.25%)	18(22.5%)	47(58.75%)
Experiments	4(5%)	7(8.75%)	18(22.5%)	51(63.75%)
Collaborative Teaching	5(6.25%)	4(5%)	13(16.25%)	58(72.5%)
Guided Questioning	31(38.75%)	14(17.5%)	27(33.75%)	8(10%)
Presentation and talk by resource persons	4(5%)	8(10%)	7(8.75%)	61(76.25%)
Fieldtrips/excursions	18(22.5%)	13(16.25%)	9(11.25%)	40(50%)
Exchange Visits	4(5%)	8(10%)	7(8.75%)	6176.25%)
Collaborative learning	68(85%)	7(8.75%)	3(3.75%)	2(2.5%)
Quizzes	3(3.75%)	7(8.75%)	14(17.5%)	56(70%)
Games	7(8.75%)	9(11.25%)	29(36.25%)	35(43.75%)
Music	3(3.75%)	2(2.5%)	4(5%)	71(88.75%)
Poetry	4(5%)	7(8.75%)	3(3.75%)	66(82.5%)
Role play	13(16.25%)	12(15%)	19(23.75%)	36(45%)
TOTAL	**377**	**284**	**441**	**1220**
AVERAGE	**13**	**9.79**	**15.21**	**42.07**

Key VO-very often; O-often; R-rare and NU- never used

Question 10 and 11 were also included in the questionnaire to probe further the teachers' conceptualisation of ESD methods and processes especial the interdisciplinary approach.

Table 4: Number of teachers who have benefitted from interdisciplinary teaching (N=80).

	Frequency	Percentage (%)
Teachers who have benefitted	14	17.5
Teachers who have not benefitted	66	82.5
Total	**80**	**100**

Ways in which they have benefitted or helped each other on topics common in different subject areas.

To assess the extent to which interdisciplinary teaching is practiced in the teaching of common concepts, item 11 in the questionnaire was included and teachers were required to indicate how they have benefitted or helped the other teacher and the following ways were forthcoming:

- Have used the other teacher as resource person
- Helped to relate locus and construction as applied to real life
- Giving other teachers feedback after attending workshops
- Through workshops on environment conservation
- Providing the technical expertise and explanation of the practical industrial technology versus the educational or theoretical base.

ESD related capacity building received by teachers

To address research question three which sought to ascertain the nature of capacity building that teachers receive in relation to ESD question 12 and13 were included and table 5 below gives a summary of the findings

Table 5: Number of teachers who received training on ESD (N=80)

	F	Percentage%
Teachers' who received training	24	30
Teachers' who have not received training	56	70
Total	**80**	**100**

Discussion

Table 1 show that teachers conceptualises the key sustainability themes although knowledge about these themes seems to be limited as it varied, depending on whether they are environmental, economic or socio-political issues. The percentage agreement on the different issues was calculated as the summary positive frequency for each issue, that is strongly agree(SA)+ Agree(A).The percentage agreement shows that local environmental issues such as air pollution ,waste management land degradation, wildlife depletion were rated higher than economic, social and political issues. Findings seem to be in accord with earlier findings by summer, Corney and Childs (2004) that environmental factors are seen more as sustainable features followed by economic factors and lastly social factors This shows that ESD is fairly understood .Conceptualisation of the environmental issues also varies according to whether they are local or globally. Environmental issues not common in Zimbabwe were lowly rated, for example, nuclear energy use, land use conflicts as well as floods. Thus, indicating that sustainability is locally and contextually defined by the teachers.

Table 2 show that although, many subjects have incorporated some sustainability issues' including the non scientific domains, the concept of interdisciplinary teaching is weakly understood and poorly practiced. Most teachers when asked how they have benefitted from these subject areas and the teachers of the other subject, results indicated that few (table 4) have benefitted as compared to those who have not benefitted. The ways in which they have benefitted also fall short of interdisciplinary teaching as only the use of the other teacher as a resource person came out more frequently. Thus, confirming earlier findings by Mwaura (2007) that ESD issues were tackled as independent units implying limited practice of interdisciplinary teaching.

Table 3 shows that information transfer methods seem to be the dominant methods used as reflected by the positive agreement percentages calculated by adding Very Often (VO) and Often responses (O) Responses show that talk and presentation methods, collaborative learning, demonstrations, debates, guided questioning and problem solving methods are the most common methods The findings corroborate earlier findings by Mwaura (2007) that ESD related studies were theoretical and lecture hall based. Although these methods provide knowledge about sustainability issues and to a certain extent develop critical thinking they are not enough as other learning outcomes for ESD such as development of values like active and responsible citizenship, an ethic of responsibility and commitment, action competence, conceptual skills of enquiry, a sense of hope and ability to imagine new possibilities, reasoning and drawing conclusion cannot be achieved if methods

such as action research, community problem solving Fieldwork, collaborative teaching, exploring indigeneous knowledge, local inquiry and case studies are rarely used by teachers. This observation necessitate a change in education in terms of goals, curricular structure and pedagogy, as observed earlier by Bernardino (2000) and latter by Charbel and Chiappetta (2010) that there is need to align ESD with active and participatory learning processes.

Table 5 indicate that there is no deliberate and systematic effort by the two ministries, which are the Ministry of Higher and Tertiary Education and the Ministry of Education Sport and Culture to train teachers on ESD. All the teachers who admitted to have received training were through the Environmental Management Agency (EMA) activities in the schools. No mention was made of the training colleges or any form of in -service training of some sort; this replicates the observation by Mwaura (2007) that there are no in-service courses for lecturers on ESD. According to Ogbuigwe (2008) ongoing capacity building is essential in ensuring ESD while Özgül (2011) found that studies in sustainable life increased the teachers' views about sustainable development, Thus substantiating Qablan et al (2009)'s argument that there is need for universities to encourage building learning communities between faculty members to advance their awareness and pedagogical knowledge that relate to ESD.

Conclusion

Limited awareness and understanding of education for sustainable development is also a challenge among secondary school teachers in Zimbabwe resulting in keeping teachers from recognising the different categories of sustainable issues. Political, economic and social sustainable issues are still poorly understood. Teaching methods are more focussed to knowledge transfer and cognitive development about sustainability with the inter-discliplinarity of ESD being still poorly understood and practiced. Teachers are not receiving adequate training in ESD methods and process except for awareness which is more inclined to environmental sustainability. Less attention is given to the economic, social and political sustainability issues. Based on the findings of this study the paper makes the following recommendations.

Recommendations

Efforts must be made to better communicate ESD more creatively so that the diversity of sustainability issues which embraces social, political and economic issues must be fully understood by the teachers in addition to environmental

sustainability issues. This could be done through rigorous curriculum orientation for teacher training courses as well as in- service courses and workshops for already practising teachers.

Establishment of ESD networks for secondary school teachers can be another strategy for effective communication of ESD at this level.

Given the multi dimensionality of sustainability issues, ESD approaches in the schools must aim for multi disciplinary approaches because there is no single solution to the problems and no one subject area can fully address the issues. This can be achieved by approaches such as the whole school approach and interdisciplinary teaching.. This would see teachers of different subjects working as parts of the system with a shared goal towards identified priority sustainability issues.

Methods of teaching must aim to transform the behaviour of pupils and communities to live sustainable livelihoods, through community engagement, participatory methods that enable learners to interact, dialogue and reflect on the issues so that learners feel bound to human community at the same time addressing community needs. There is no single best method of teaching ESD hence all methods should be used contextually within a particular time, space and content, but, what is critical is that the amalgam of methods must be used with the community/society in mind.

References

Bernadino, C.S. (2000). Exploring Education for Sustainable Development: Its theory and practice in Philippine higher education institutions. PhD thesis. Canada. University of Alberta.

Brundtland Report (1987). Report on Sustainable Development. retrieved from http://www.ace.mmu.ac.uk/ESD/Action/Brundtland-Report.html.

Charbel, J. and Chiappetta, J. (2010). Greening of Business Schools: a systemic view *International Journal of Sustainability in Higher Education* 11(1): 49-60.

Collins-Figueroa, M. (2008) . Introduction to Environmental Education and Sustainable Development in the Caribbean: *Caribbean Journal of Education* 30(1). v-xii.

Corney, G.(2006). Education for Sustainable development: An empirical study of the tensions and challenges faced by geography student teachers. International Research on Geography and Environmental Education 194.0: 224-240.

Dale, A. & Newman, L. (2005). Sustainable development, Education and Literacy: Sustainability in Higher Education. 6 (4): 351-362.

Ekosse, G.E. (2009). Aspects of Research Associated with Education for Sustainability in the 21st Century. Paper presented at the 36th International Conference of the Southern African Society for Education (SASE), East London, South Africa 1-3 October, Walter Sisulu University.

Hopkins, C. (2008) Plenary discussion: International committee Meeting for Education for sustainable Education World conference, Paris, 31 October 2008.

Huckle, J.and Sterling, S, R, (2006).Education for Sustainability. London: Earth scan.

IUCN/UNEP/WWF. (1991). Caring for the Earth: A Strategy for sustainable Living, London: Earth scan publications Ltd.

IUCN (2000). Supporting the United Nations decade of Education for Sustainable Development 2005-2014. Reading 2.28. Gland Switzerland: IUCN publications.

Liarakou, G. and Flogatis, E. (2007.) *From Environmental Education to Education for Sustainable Development: Issues, Trends and Proposal*, Nissos Publications. Athen

Lotz-Sisitka, H.; Olvitt, L.; Gumede, M.; Pesanayi, T. (2006) *History and context of ESD in Southern Africa: Supporting participation in the UN Decade of Education for Sustainable Development*.SADC REEP: Howick.

Mwaura,K.N.(2007.) An investigation into awareness about Education for Sustainable Development: A study of the Faculty of Education at the Catholic University of Eastern Africa, M.Ed thesis, Post graduate Department Nairobi.

Özgül, K. (2011). Determination of the Preservice Science Teachers' Views about Sustainable Development and Sustainable Schools. European Journal of Social Sciences 22 (3): 382-392.

Ogbuigwe, A. (2006).Mainstreaming Environment and Sustainability into African Universities Partnership Awards for Education for Sustainable Development

Innovations Programmes in African Universities.http://www.unep.org/training/mesa/awards.asp.visited May 2011.

Ogbuigwe, A. (2008) Delivering Education for Sustainable Development through the MESA Partnership: *Journal for Sustainable Development* (2):157-165.

Peden, M. (2008).Education for Sustainable Development: Knowledge and Environment in South African schooling. *Southern African Journal of Environmental Education* (25):13-24.

Pigozzi,M.J. (2003). UNESCO and the International Decade of Education for Sustainable Development(2005-2014) UNESCO International Education Newsletter vol,xxviii,No,1-2.

Qablan, A.M.; AL-Ruz, J.A; Khasawneh, S. And Al-Omari, A. (2009) Education for sustainable development: Liberation or indoctrination? An assessment of faculty members' attitudes and classroom practices. International Journal of Environment and Science Education 4 (4):401-417.

Rosenberg,E,O'Donoghue,R and Olvitt,L(2008). Methods and Processes to Support Change-oriented Learning,C.A.P.E.CEP,Rhodes University, Grahamstown.

Summer, M.Corney, G, and Childs, A (2004). Student teachers' Conceptions of Sustainable Development: the Starting Points of Geographers and Scientists. Educational Research 46 (2): 163-182.

Tilbury, D and Wortman, D. (2004). *Engaging People in Sustainability*, Gland, Switzerland: IUCN.

Tilbury, D. (2011) Education for Sustainable Development: An expert Review of processes and learning, Paris : UNESCO.

UNESCO (2005b). United Nations Decade of Education for Sustainable Development Draft International Implementation Retrieved from Scheme@http://www.unesco.org/education/desd.

UNESCO (2009). United Nations Decade of Education for Sustainable Development Midterm Review draft. Retrieved from http://www.unesco.org/education/desd/midterm/review.

UNICED (1992). Promoting Education and Public Awareness and Training: Agenda 21, Chapter 36, United Nations Conference on Enviroment and Development (UNICED). Retrieved from http://www.sedac.ciesin.org/entri/texts/a21/a21-36education.html

World Commission on Environment and Development (WCED), (1987). Our Common Future. Oxford: Oxford University Press.

Zimbabwe National Environmental Education Policy and Strategies (2003). Government Printers: Harare.