

Activating Primary School Learners: Sustainability Education In South Africa

Ezgi Ercan

Master Thesis Series in Environmental Studies and Sustainability Science,
No 2012:005

A thesis submitted in partial fulfillment of the requirements of Lund University
International Master's Programme in Environmental Studies and Sustainability Science
(30hp/credits)



LUCSUS

Lund University Centre for
Sustainability Studies

Activating Primary School Learners: Sustainability Education In South Africa



Ezgi Ercan

15 May 2012

Supervisor: Melissa Hansen

Co-supervisor: Bodil Elmqvist

A thesis submitted in partial fulfillment of the requirements of Lund University International Master's Programme in Environmental Studies and Sustainability Science (LUMES) for the degree of Master of Science



LUND UNIVERSITY

Abstract

Although education is considered as one of the most effective approaches in terms of addressing sustainability challenges and formulating solutions, traditional education methods remain inadequate in this regard. This is because these methods are based on passive and teacher-centred approaches to learning. In this context, the experiential education and active learning framework, grounded in John Dewey's constructivism and pragmatism, is an alternative to traditional educational approaches, emphasizing student participation and supporting praxis.

This qualitative research aims to evaluate the impacts of an experiential and active learning framework on learner's knowledge of local and global sustainability challenges. This has been undertaken through fieldwork conducted in cooperation with the South African Eco-Schools Programme. The main focus of the study is at the primary school level, primarily Grades 6 – 7. Data has been collected through semi-structured and unstructured interviews with teachers, educators, learners and academics, as well as observations of workshops, learning activities and school grounds. A review of relevant documentation, including school portfolios and Eco-School documents, was also undertaken.

Research results demonstrate that the South African education system still experiences major problems in providing a quality education for all learners, due mainly to existing socio-economic problems. It was found that teacher guidance was crucial to the success of education for sustainability, especially in the context of significant social problems such as poverty, HIV/AIDS and resulting high percentage of orphans in schools, as well as limited resources for learning. Therefore, the Deweyan paradigm, which is grounded in learner-centred concepts and considers teachers only as facilitators, might be applicable elsewhere in South African context, however cannot be considered as an efficient approach within the scope of the study. Further, findings indicated that classroom education, which incorporates real-life stories and narratives, followed by active involvement and experiments, give the best education results, in relation with learning local and global sustainability challenges. Significantly, the major contribution of experiential and active learning approaches in South African primary schools is to an improvement in the quality of basic education, especially with regard to basic skills such as literacy and numeracy.

Keywords: South Africa, Eco-Schools, Sustainability Education, Environment, Primary School Learners, Experiential Education, Active Learning

Acknowledgements

Lots of thanks to my lovely supervisor Melissa Hansen, for being a friend rather than a thesis advisor: your support, help and spirit kept me going so many times! Also thanks to Bodil Elmqvist for encouraging comments.

Bridget, Anisa, Shari, Pandora, Charlene, Eidin and others from Eco-Schools-South Africa, I could not have handled this project without your input, thank you for answering my endless questions and inspiring me with your working enthusiasm. Also many thanks to Prof. Rob O'Donoghue from Rhodes University: you gave me lots of valuable information within short amount of time we have met and provided a whole new aspect of thinking.

LUMES classmates, now I can thank each of you for this inspiring, heart-warming, educating and unique journey in around thirty languages. It was such a meaningful two years of my life and it is so nice to know that I have a home now in all those different, beautiful countries.

Finally, my dear family and Erik thank you very much for your support, love, tolerance and many other beautiful things you generously gave, I dedicate this work to you.

Ezgi Ercan, 15 May 2012, Lund

Table of Contents

1. INTRODUCTION	6
1.1. AIM AND RESEARCH QUESTIONS	8
1.2. THESIS RATIONALE	9
1.3. TARGET AUDIENCE	10
2. THEORETICAL FRAMEWORK	10
2.1. JOHN DEWEY'S CONSTRUCTIVISM AND EDUCATIONAL PRAGMATISM	11
2.2. EXPERIENTIAL EDUCATION AND THE ACTIVE LEARNING FRAMEWORK	12
2.2.1. <i>LINKING JOHN DEWEY'S APPROACH WITH WESSA AND ECO-SCHOOLS</i>	13
3. INTRODUCTION TO THE CASE	14
3.1. THE SOUTH AFRICAN EDUCATIONAL CONTEXT	14
3.2. THE ECO-SCHOOLS INITIATIVE, WESSA AND OTHER PARTNERS	16
4. METHODOLOGY	17
4.1. RESEARCH APPROACH	17
4.2. EPISTEMOLOGICAL AND ONTOLOGICAL CONSIDERATIONS	18
4.3. RESEARCH DESIGN	18
4.4. RESEARCH METHODS	19
4.4.1. <i>DATA COLLECTION AND ANALYSIS</i>	19
4.4.1.1. <i>LITERATURE REVIEW</i>	20
4.4.1.2. <i>INTERVIEWS</i>	20
4.4.1.3. <i>OBSERVATIONS</i>	20
4.4.1.4. <i>DOCUMENT ANALYSIS</i>	21
4.5. ETHICAL CONSIDERATIONS	21
4.6. VALIDITY AND RELIABILITY	22
4.7. LIMITATIONS OF THE STUDY	22
5. RESULTS AND ANALYSIS	23
5.1. IMPRESSIONS FROM THE SOUTH AFRICAN EDUCATIONAL SYSTEM	23
5.1.1. <i>PROBLEMS IN THE EDUCATIONAL REALM</i>	24
5.1.1.1. <i>TEACHER DISTRIBUTION</i>	24
5.1.1.2. <i>RESOURCE ACCESS, ALLOCATION AND TEACHERS' APPROACH</i>	24
5.1.2. <i>PROBLEMS IN THE SOCIAL SPHERE AND RESULTANT IMPACTS ON EDUCATION</i>	25
5.1.2.1. <i>LANGUAGE BARRIER</i>	26
5.1.2.2. <i>HIV/AIDS, ORPHANS AND POVERTY</i>	26
5.2. THE ECO-SCHOOLS APPROACH TO SUSTAINABILITY EDUCATION WITHIN THE CASE	28
5.3. HOW CHILDREN ENGAGE WITH LOCAL SUSTAINABILITY PROBLEMS THROUGH ECO-SCHOOLS EDUCATION	32
5.4. HOW CHILDREN ENGAGE WITH KNOWLEDGE OF GLOBAL SUSTAINABILITY PROBLEMS THROUGH ECO-SCHOOLS EDUCATION	37
6. DISCUSSION	40
6.1. THE ECO-SCHOOLS PROGRAMME AS A CONTRIBUTOR TO QUALITY OF EDUCATION IN SOUTH AFRICA AND THEORETICAL CRITIQUES	40
6.1.1. <i>HOW CAN ECO-SCHOOLS SUPPORT THE EDUCATION SYSTEM FURTHER?</i>	41

6.2. TO WHAT EXTENT DOES ECO-SCHOOLS FACILITATE ENGAGEMENT WITH LOCAL SUSTAINABILITY PROBLEMS?	43
6.3. HOW BETTER INCORPORATE GLOBAL SUSTAINABILITY ISSUES INTO THE ECO-SCHOOLS?	43
7. CONCLUSION	44
8. REFERENCES	46
APPENDICES	51
<i>APPENDIX 1: INTERVIEW QUESTIONS</i>	51
<i>APPENDIX 2: AVAILABLE INTERVIEW TRANSCRIPTS</i>	52
<i>APPENDIX 3: SUPPLEMENTARY PHOTOS FROM THE FIELDWORK</i>	54

List of Abbreviations

CAPS	Curriculum Assessment and Policy Statement
MMAEP	Midlands Meander Association Education Project
NGO	Non-Governmental Organization
OBE	Outcomes-Based Education
WESSA	Wildlife and Environmental Society of South Africa
WWF-SA	World Wide Fund for Nature- South Africa

List of Figures

FIGURE 1: MMAEP EDUCATOR HELPING LEARNERS TO DEFINE HERBS IN SCHOOL GARDEN	32
FIGURE 2: TYRE-POTS IN PERMACULTURE GARDEN	32
FIGURE 3: WINNER OF AN ART COMPETITION	32
FIGURE 4: INDIGENIOUS TREE PLANTATION	34
FIGURE 5: RECYCLING STATION	34
FIGURE 6: RE-USE OF PET BOTTLES	34
FIGURE 7: WALL ART FROM BOTTLE CAPS AND OTHER WASTE	34
FIGURE 8: MATERIAL RE-USE FOR ART	34
FIGURE 9: EDIBLE HERBS AND GARDENING ACTIVITY	36
FIGURE 10: GLOBAL SUSTAINABILITY CHALLENGES POSTER	38
FIGURE 11: ANOTHER POSTER FROM THE SAME COMPETITION	38
FIGURE 12: RECYCLING IN SCHOOL GARDEN	38
FIGURE 13: TALKING ABOUT THE IMPORTANCE OF RECYCLING	38
FIGURE 14: DURING PROJECT PREPARATION OF A SOLAR OVEN	40
FIGURE 15: STUDENTS PRESENT THEIR PROJECTS TO THEIR CLASSMATES	40
FIGURE 16: EXTENT FROM RECYCLING STATION, THE BIRCHES PRE-PRIMARY SCHOOL	54
FIGURE 17: PERMACULTURE GARDEN, THE BIRCHES PRE-PRIMARY SCHOOL	54
FIGURE 18: ENVIRONMENTAL IMPACT ASSESSMENT TASK	55

1. Introduction

“Education is the most powerful weapon which you can use to change the world.”

Nelson Mandela

It has been argued that one of the most effective means of taking action towards sustainability begins with education, starting from early ages, and motivating individuals to continue their practices lifelong (Davis, 1998, p.117; Calder & Clugston, 2005). Education is fundamental in terms of stimulating individuals, as citizens, to improve their current skills, understanding and capacity to make change happen, within social and environmental realms through focusing on both theoretical knowledge and experiences (Otieno, 2008). Societies need alternatives to alter their practices towards sustainable ones, but primarily, they need to be educated about these alternatives¹, which will, in theory, encourage them to adopt these practices. As far as children’s sustainability education is concerned, espousing “*organic, participative, open, iterative and evolving pedagogies*” (McNaughton, 2010, p. 290) is critically significant. This means that we need to address the often ill functioning and traditional education practises that are teacher-centred and grounded in rote-learning and passive techniques (Smith, 2002).

In this regard, the negative outcomes of commonly adopted top-down, central, passive and isolated education approaches – referred to throughout this thesis as traditional educational practices – that limit action, participation and authenticity have been emphasized (Scrivener, 2003; Uzzell, 1999). Traditional educational practices remain passive since learners do not have the chance to critically think and reflect upon real-world problems in practice. The main reason that children often fail to understand sustainability problems, is being taught of certain phenomena in a one-dimensional manner, thus hindering their ability to question further and reveal underlying facts and ideas (Smith, 2002).

Furthermore, Uzzell (2000) has emphasized that, in spite of the holistic features of our contemporary lifestyles, when it comes to highlight the global nature of sustainability problems, current educational endeavours remain inadequate in terms of explicating the contributory impacts of local problems to global challenges. It has been concluded by various studies (Pramling Samuelsson & Kaga, 2008; Calder & Clugston, 2005) that there is a need for novel approaches in the educational realm in terms of creating awareness, especially as far as depleted resources, climate change, pollution and other sustainability challenges are concerned which are directly related with the welfare of future generations. Similarly, it has been emphasized that the significance of adopting a well-functioning, participatory and multi-disciplinary environmental education notion, starting from primary school level, will contribute to the development of individuals who are actively contributing to the problem solving process (Mordock & Krasny, 2001; Knapp, 2005). In an educational platform where teachers are not the single source of

¹ WESSA, Workshop for Eco-Schools Representatives from Uganda, Umgeni Valley, Howick, 22nd Feb, 2012

knowledge, children might “[...] become the creators of knowledge rather than the consumers of knowledge created by others” (Smith, 2002, p. 593).

It is argued that informing children about the interrelated problems of local and global environmental change would motivate them to participate in the problem-solving stage of local environmental issues – ultimately contributing to the process of shaping “*global citizenship*”² (Uzzell, 2000, p. 317; Uzzell, 1999). It is crucial to treat children as equal and critical citizens, instead of as passive learners (Uzzell, 1999), in order to stimulate their responsibility while engaging them with sustainability issues. Along with participating in the learning process actively, learners might also contribute to problem solving of local sustainability problems through increased dialogue with community members, rather than being isolated in their classrooms (Scrivener, 2003). In addition to the theoretical materials of the primary education curriculum, incorporating active techniques and real-world problem solving practices into the learning process, might greatly contribute to overall education quality. Also, this would encourage the learners to reflect upon the status-quo and help them to express their personal opinions and values, which is another noteworthy outcome of this approach to education (Smith, 2002; Scrivener, 2003).

In this regard, supporting activities that seek to establish a connection between children and their local environment is fundamental and relevant (Scrivener, 2003), which also would contribute to “[...] the long-term sustainability of people's home communities” (Smith, 2002, p. 593) through increasing awareness. Achieving this goal requires adopting different pedagogies that are able to ensure children’s understanding of local issues and creating a platform for engaging them with these problems (Gough, 2002; Smith, 2002).

Thus, learners should be considered as active participants instead of passive learners (Reid & Nikel, 2008). This is also the approach taken by the experiential education concept, as well as the active learning framework (Breunig, 2005; Prince, 2004). Experiential education can be put into praxis in different ways. In this regard, the active learning framework can be indicated as one of the associated approaches of this philosophy, which entails “[...] student activity and engagement in the learning process” (Prince, 2004, p. 223)³.

Various studies (Blair, 2009; Malone & Tranter, 2003; McNaughton, 2010) indicate that even small-scale collaborative practices such as school gardening, playground design and maintenance, drama and sports play an important role in terms of improving children’s environmental and social competence. In this context, going beyond classrooms and engaging children with nature and even seeking simple solutions to local sustainability problems in a participatory and interactive atmosphere, is considered quite essential in terms of developing ownership, responsibility and citizenship feelings among children at the primary school level (Smith, 2002; Calder &

² Uzzell (2000) explained “global citizenship” as; becoming responsible citizens that taking action in local level, but considering their global impacts and consequences as well.

³ These concepts will be explained in detail in Chapter 2: Theoretical Framework

Clugston, 2005). Hence, children in early ages should be introduced to the global nature of sustainability challenges, and they should be educated in a way that they can recognize that the consequences of even small individual actions might cause greater damages elsewhere (Sabo, 2010). Accordingly, schools and associated initiatives should act as agents who facilitate dialogue between learners and local community organizations and members in terms of increasing children's awareness about local and global sustainability problems (Smith, 2002).

This research is based on the belief that sustainability is about activism, it is about taking action even though it is small scale, local action which does not have a profound impact for the rest of the world. This thesis is based upon the belief that learners exposed to quality sustainability education starting from early ages will be more sensitive and nuanced in thinking about human-environment relations, and might contribute to the development of innovative solutions to sustainability challenges. Nevertheless, the prevalence of sustainability education for primary school pupils is questionable at the global level, and especially within the context of developing countries since people's priorities are rather different (Are, 2008). In particular; learners who live in urban areas are more likely to be exposed to a better standard of sustainability education than their peers living in rural communities⁴. This is because under-resourced (both in terms of the availability of teachers and learning materials) rural schools have a limited capacity to institute sustainability education programmes. In addition, as mentioned above, traditional educational practices are limited in allowing children to identify natural systems, collaborate with each other and actively shape their own knowledge within an inspiring and synergetic environment (Davis, 1998; Smith, 2002; McNaughton, 2010). Thus, this research discusses the extent to which quality education for sustainability may be achieved through the active learning framework at the primary school level, rather than through solely classroom-based education.

1.1. Aim and Research Questions

This research's main focus is sustainability education at the primary school level, in particular, an evaluation of the applications of the active learning framework, and its' complementary impacts upon learning. This research aims to gain an understanding of the distinction of the active learning framework in relation to traditional educational approaches. The methodology adopted is that of understanding a specific context through experiencing it, in other words, as McTaggart (1999, p. 493) stated, "*creating explanations*" through experiences.

Furthermore, the research investigates to what extent children understand sustainability issues in their local community, and how they relate these problems with global challenges, through the active learning framework. This has been conducted through a case study approach of the implementation of the Eco-Schools Programme in South Africa, in primary schools in and around the town of Howick.

⁴ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

In this context, the research has two main objectives, as follows:

1. Analysing mechanisms for the implementation of the active learning framework in primary schools in the case study area.
2. Analyzing the outcomes of the implementation of the active learning framework, both in terms of the educational system, and of children's approaches to sustainability challenges, in the case study area.

Specific research questions consist of one main question and three sub-questions, in relation with the research objectives introduced above. In this regard, the main question of the research is:

What are the complementary impacts of the active learning framework for sustainability education at the primary school level in and around Howick, South Africa?

Sub-questions are particularly in relation with children's perceptions and role of the active learning framework, as follows:

1. How is the active learning framework implemented in relation to the traditional education system in South Africa?
2. Do children contribute to the problem-solving process of local sustainability concerns through the active learning framework?
3. How does the active learning framework influence children's knowledge of global sustainability issues?

1.2. Thesis Rationale

My personal experiences predominantly motivated me to conduct research in this field, along with the concerns mentioned in the introductory chapter. Imagining my own childhood, my education was based on an educational approach that prioritizes theoretical learning, and does not allocate time for practices within crowded classrooms. Trying to grow beans in a jar for science class and rarely arranged nature trips seemed much more meaningful and remarkable. Being critical of the traditional educational system, along with the initially conducted literature review, allowed me to reflect upon the importance of personal experience for effective learning once more.

South Africa was chosen as the case in order to familiarize myself with a different context, keeping the research exciting while at the same time learning about South Africa's ongoing curriculum, educational transitions⁵. Since I personally knew the Eco-Schools-South Africa national coordinator, Bridget Ringdahl, from the LUMES⁶ alumni network, it facilitated my connections with staff in the region and constituted a strong

⁵ This will be discussed in more detail in Chapter 3: Introduction to the Case

⁶ LUMES: Lund University International Master's Programme in Environmental Studies and Sustainability Science

motivation for the associated fieldwork. This was along with the idea that English is one of the official languages of the country, which allowed me to gather more data.

Apart from and the active learning framework, the interplay between local and global sustainability challenges has been utilized as a frame in order to provide a better-adjusted scope, which ultimately contributed to more specific data collection. Since educating children is directly investing to our common future (Davis, 1998), seeking the successful characteristics of this case and identifying gaps to be bridged, might be transferable and constitute a role-model for other cases, which eventually might contribute to improving the quality of education for sustainability elsewhere in the world. This is something that I consider a strong motivation for this study.

1.3. Target Audience

The primary intended audience of this research are teachers, who are the primary agents of change for sustainability education. In addition, environmental NGOs, their educators or independent trainers working with experiential education and active learning techniques, as well as parents who are enthusiastic about raising their children as critical and environmentally responsible citizens are targeted. Lastly, it is expected that researchers and academics investing in education for sustainable futures, as well as policy-makers in both Education and Environmental Affairs departments will find this research useful.

2. Theoretical Framework

This research critically approaches traditional education norms and aims to evaluate progressive and active education techniques. This is undertaken through an analysis of the implementation process and outcomes of the active learning framework, primarily focusing on local and global sustainability challenges. In this regard, the theoretical framework of this research has been grounded in John Dewey's progressive education ideas and theory of experience, which have been applied throughout the fieldwork process (Kivinen & Ristelä, 2003).

In order to apply theory to real life situations, perhaps even modify it – a practical framework that consists of John Dewey's constructivism and educational pragmatism, experiential education, and the active learning framework has been adopted. With the help of this framework and methodology⁷, assessing the function of the pre-determined theoretical approaches within a particular case and gaining a better understanding of the social, cultural and environmental context embodied in the case study area are also expected outcomes.

⁷ See Chapter 4: Methodology

2.1. John Dewey's Constructivism and Educational Pragmatism

John Dewey is considered as one of the most prominent philosophers who brought constructivist and pragmatist approaches together under the umbrella of education and started a new era of active education practices (Maloof, 2006; Uygun, 2008; Kivinen & Ristelä, 2003).

The constructivist aspect of his educational paradigm requires learners to construct alternative modes of thinking and approach a certain problem when the conventional methods remain inadequate or the problem is novel (Sutinen, 2008). In this sense, Sutinen (2008, p. 1-2) clarifies the relation between pragmatism and constructivism through indicating Dewey's perspective:

"Constructivism is based on the assumption that the individual's construction processes cannot be influenced from the outside [...]. If, however, we want to explore constructivism from an educational point of view, we need a different kind of constructivism. Such an approach can be found in pragmatism [...]. John Dewey and George H. Mead conceived of mental activity in the context of human action and particularly in relation to problem solving in relation to human action."

Authors point out the supplementary nature of action to theoretical learning methods, and stress that when kept in the theoretical field and hindering relevant practical action, the educational system would not be effective and resilient, and thus apt to fail (Emirbayer & Maynard, 2011). Therefore, there is a need for engaging theoretical knowledge with practical action in a purposeful way, which has been defined as pragmatism in the literature (*ibid.*; Sutinen, 2008).

The notion of pragmatism can be interpreted in myriad ways, but Dewey's progressive education paradigm advocates that the learning process must be complemented with praxis, and allow learners to actively participate and experience knowledge by themselves as a constructive process (Wanyama, 2009, p. 54; Maloof, 2006). Similarly, Dewey considered that actively experimenting allows one to validate that knowledge. Hence, the experience of understanding the educational content consists of both theory and practice, which are inseparable concepts (Garrison, 1995; Glassman, 2001).

Finally, Dewey argued that educational attempts require continuous practices as an essential component of his theories, since the internalization of knowledge is an ongoing process itself. In order to convert abstract theoretical information into permanent, well-understood knowledge, learners are expected to interact with their environment and experience (Sutinen, 2008). In addition, a certain time period is needed in terms of reflecting back on experiences and theory (Sutinen, 2008; Breuning, 2005). Also, Dewey stressed the significance of communication, participation, interaction and purposeful experience, thus introducing the concepts of experiential education and active learning which is the main theoretical standpoint of this research (Maloof, 2006; Kivinen&Ristelä, 2003; Uygun, 2008).

2.2. Experiential Education and the Active Learning Framework

John Dewey's constructivism and pragmatism has been reviewed and discussed by numerous authors. In this regard, Carroll Jacobs (2009) argued for the role of constructivism within the pragmatist paradigm and addressed the role of experiences and experiments as indispensable means of learning, allowing learners to construct their own reality, according to Dewey's constructivist point of view. Similarly, Garrison (1995, p. 731) also addressed Dewey's constructivist paradigm as one of the primary means of progress in the educational field, pointing to a quote from Dewey himself, that "[e]ducation is not an affair of 'telling' and being told, but an active and constructive process". In this sense, stimulating pupils to strengthen their bonds with the surrounding environment, as well as leading them to understand the sustainability concept through hands-on techniques, would ultimately allow them to construct scientific knowledge and increase their knowledge, creativity and feelings of ownership towards the learning process (Maloof, 2006; Sutinen, 2008).

Instead of trying to think about potential answers to fictional problems at schools, allowing learners to confront real-life situations and generate alternative solutions to these actual problems, would develop their analytical thinking skills and allow them to understand problems in a multi-dimensional way – and to better cope with these in the future (Sutinen, 2008; Maloof, 2006). In this regard, the research here has focused on experiential education, also occasionally referred to as place-based education, which is essentially based on the idea of the active involvement of learners, through taking education beyond classrooms, starting from early ages (Smith, 2002; Howley et al., 2011; Maloof, 2006). Smith (2002, p. 594) pointed out the significance of harnessing the local environment in terms of associating educative experiences and knowledge as follows:

"By reconnecting rather than separating children from the world, place-based education serves both individuals and communities, helping individuals to experience the value they hold for others and allowing communities to benefit from the commitment and contributions of other members."

Educational practices that serve the greater aim of contributing to an improvement in the local community that learners are part of, might easily attract them, especially at the primary school level, as the results they obtain at a small scale might increase their motivation for the further action. In addition, collaborative working might create a platform for learning about social merits such as supporting each other, cooperation and communication (Glassman, 2001; Somekh & Zeichner, 2009; Sutinen, 2008). In this sense, Dewey pointed to the key role of experiential education, which encourages learners towards continuous action through new achievements and experiences (Glassman, 2004; Glassman, 2001).

In order to establish a bridge between the statements about constructivism and the experiential education philosophy, Dewey mentioned that personal experiences and active problem solving attempts contribute to individuals' knowledge-construction process (Prince, 2004). In particular, this is explained as the active learning framework, which is a sub-set of experiential education as it has been introduced above (*ibid.*).

These experiences should take place continuously for a better understanding and a well-functioning educational platform (Knapp, 2005; Sutinen, 2008). On the other hand, experiences are not adequate by themselves in terms of quality primary education, if pupils misinterpret these experiences; it might be problematic for the entire learning process (Garrison, 1994). Therefore, teachers should always be there as innovative architects of learning-by-doing practices who facilitate the learning process (Hyslop-Margison & Strobel, 2007; Smith, 2002).

Obstacles and unclear points on the implementation stage of experiential techniques can be fixed in time through communication between teachers and learners, and amongst learners themselves (Prince, 2004; Breuning, 2005). In this context, the tenets of Dewey's philosophy of experiential education consider schools as social institutions where individuals exchange ideas, emotions and actively construct a common language, rather than solely focusing on academic studies (Breuning, 2005). School principals and other educators who are in charge of the administrative boards should design their educational approach in line with these elements, and connect local communities with school practices through involving learners in social and environmental projects (Glassman, 2001; Sutinen, 2008) and perhaps even beyond their surrounding environment, making broader links to global issues.

2.2.1. Linking John Dewey's Approach with WESSA and Eco-Schools

Eco-Schools-South Africa is coordinated through the Wildlife and Environment Society of South Africa (WESSA) in collaboration with the World Wide Fund for Nature, South Africa (WWF-SA). The Eco-Schools Programme has been implementing the active learning framework in cooperation with government and private schools, with the contribution of a great amount of partners throughout South Africa, while constantly seeking ways to improve their practices⁸. In addition, programme coordinators and educators consider sustainability education as a complementary approach, which aims to develop basic education, along with informing children about the environment and sustainability⁹.

Integrating the active learning framework into the curriculum and providing continuous learning is directly linked with Dewey's theoretical standpoint, as well as the educational approach adopted by the Eco-Schools Programme. In a similar way to Dewey's ideas, supplementing curriculum knowledge with continued praxis, encouraging the use of language and personal interactions during experiences is fundamental for the Eco-Schools Programme (Glassman, 2001; WESSA & WWF, n.d., p. 3). Dewey's thoughts regarding deploying purposeful educational experiences in line with the curriculum, rather than random activities (Maloof, 2006) is also connected with the Eco-Schools' approach. Thus, the case has been determined in relation with its compliance with the adopted theoretical framework.

⁸ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

⁹ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

3. Introduction to the Case

This chapter contains an overview of the current South African educational system and notably, post-Apartheid curriculum transitions. This is in order to contextualize the approach to educational practices. This is followed by an introduction to the Eco-Schools Programme and its implementing partners.

3.1. The South African Educational Context

Interviews with teachers, government officials and professional educators, along with curriculum document¹⁰ reviews, show that South Africa still experiences major problems, inherited from the Apartheid-era, in its' education system. The Apartheid period is responsible for racial segregation and unequal resource allocation in schools. What is more, due to mismanagement and a lack of institutional capacity, the post-Apartheid education system is also in a state of deterioration. South Africa is often cited as having lower literacy and numeracy scores than poorer neighbouring countries¹¹. To address these problems, the South African Government is currently working on revising the national curriculum, in order to leave behind the inequalities remaining from Apartheid-era education, and the immediate post-Apartheid outcomes-based education (OBE) curriculum.

In the post-Apartheid era, participation and equity were key words in the educational realm, and they also became basic tenets of “*course design*” in the 1990s, under the umbrella of OBE (Lotz-Sisitka & O'Donoghue, 2008, p. 113). OBE was based on a learner-driven understanding, and considered learners' personal achievements as the basis for evaluation (Vambe, 2005). The OBE model was expected to significantly improve the quality of education in South Africa, and allow pupils to actively construct knowledge and life skills through “[...] *problem-solving, creativity, and the acquisition of skills and attitudes*” (Botha (Nico), 2002, p. 366). However, many authors have argued that as this student-centred approach has been put into practice while country was in economic and social turmoil in the aftermath of Apartheid, the educational system was not capable of supporting the requirements of such an approach (*ibid.*; Lotz-Sisitka & O'Donoghue, 2008). In this sense Botha (Nico) (2002, p. 361) crucially stressed the problems, which paved the way for the failure of OBE's:

“[...] The provision of equal access to schools, unequal educational opportunities, irrelevant curricula, inadequate finances and facilities, shortage of educational materials, the enrolment explosion and inadequately qualified teaching staff.”

Although an originally innovative and favourable idea, authors concluded that due to disoriented policies, lack of capacity and disregarded socio-cultural patterns, which

¹⁰ Curriculum and Assessment Policy Statement documents published by South Africa Department of Basic Education (see References)

¹¹ Bridget Ringdahl, National Eco-Schools Coordination, presentation at WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th Feb, 2012

fundamentally depend on the local context, OBE remained a shallow and incompetent approach (Lotz-Sisitka & O'Donoghue, 2008). This was especially so during the social and cultural reconstruction process of the country, facilitating an educational crisis (Vambe, 2005). Thus, although the OBE curriculum was adopted with the idea of transparency and social justice (*ibid.*), it had to be abandoned very recently in 2010¹², for the reasons mentioned above. In 2011, government introduced the new Curriculum Assessment and Policy Statement (CAPS) plan into institutions. At present, there is a trial process underway with CAPS, which is to be implemented in stages from 2012, and is expected to be fully implemented by 2015 (South Africa Department of Basic Education, 2011, p. *foreword*).

The new CAPS curriculum includes a standpoint against discriminatory impacts remaining from Apartheid-era education and the previously implemented OBE curriculum period. CAPS emphasises the principle of "*inclusivity*", advocating that all children have the right to be part of the educational system, regardless of their "[...] *socio-economic background, race, gender, language, age, physical ability or intellectual ability*" (South Africa Department of Basic Education, 2011, p. 4-5). In a similar manner to CAPS, John Dewey also suggested an educational basis which is "[i]nclusive, [...] *focused on the building of trust that affirm, nurture, support*" (Davis, 1998, p. 119). Another substantial feature of the new curriculum is that, along with the aim of developing the basic educational skills of learners such as literacy and numeracy, it articulates the necessity and significance of praxis and innovative educational activities, and even encompasses finding "*solutions to everyday problems*" (South Africa Department of Basic Education, 2011, p. 16). In other words, the requirement for the active participation of learners in the educational process has been clearly highlighted (*ibid.*, p. 13-16) as it also suggested by Dewey. According to certain educators¹³, the CAPS curriculum is considered to be user friendly, due to its clear content and explicit references to relevant resources to be used during teaching (South Africa Department of Basic Education, 2011, p. 20). Thus it is expected to streamline teachers' tasks regarding time and content management¹⁴.

There are certain critics against and in favour of the new CAPS curriculum. While some educators believe that CAPS will be helpful in terms of time management and the organization skills of teachers, some suggest that it might limit creativity in teaching due to its strict content descriptions¹⁵. In other words, although it is expected to increase the quality of teaching in under-resourced, rural schools, it might undermine the quality outcome in affluent urban schools. South Africa is once again in a controversial transition process in terms of educational content, from OBE to CAPS. Since it is a present transition, time will show if this theoretically purposeful approach will function as intended in practice.

¹² WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

¹³ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

¹⁴ Anisa Khan, presentation at WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 7th Feb, 2012

¹⁵ Red Cap Schools: Schools of Excellence Workshop, Durban, 20th Feb, 2012

3.2. The Eco-Schools Initiative, WESSA and Other Partners

Fieldwork for the study has been conducted in the Republic of South Africa, through focusing on the Eco-Schools Programme. The programme is operated by WESSA in cooperation with WWF-SA¹⁶. WESSA is an umbrella organization that has numerous partners, including government officials; NGOs; institutions (i.e. Rhodes University); wildlife clubs; and independent consultants, who are working all over South Africa on continuing projects around sustainability, education, practical work or theoretical aspects¹⁷. The Eco-Schools programme is one of these ongoing projects, conducted with diverse partners. The Midlands Meander Association Education Project (MMAEP)¹⁸ is an NGO that collaborates with WESSA in and around Howick, under the KwaZulu-Natal regional Eco-Schools coordinator. Much of the research work presented in this thesis has been conducted in collaboration with the MMAEP. Being a part of an extensive network of Eco-Schools partners, gives smaller NGOs' and initiatives such as the MMAEP credibility, provides an external motivator and facilitates reaching more people¹⁹. Along with the increased number of educators working for Eco-Schools through the involvement of other NGOs, teachers get a lot of value from action projects and schools benefit from environmental awards won through Eco-Schools. Also, multiple-partner supported school projects are more likely to continue where municipalities, libraries, NGOs or other initiatives are involved²⁰.

The Eco-Schools Programme is designed in-line with the CAPS curriculum, in order to be more effective. This allows educators to work both out of and within CAPS to improve its outcomes. Eco-Schools educators act as agents who are facilitating teacher's work, through integrating active projects into curriculum learning. These include maths for measuring gardens, calculating the prices of seeds, as well as working on soil type and observing plantation for science classes²¹. Along with contributions to children's improved understanding of environment, the programme also focuses on developing basic education skills. According to the Eco-Schools coordinators, school-learning levels in South Africa are rather low, therefore they keep the level very basic, for example improving children's reading and learning through environmental stories²². In this sense, educating children is a priority and environment is a tool, which is expected to make teachers familiar with pedagogic approaches around experiential and active learning²³.

¹⁶ Further information can be obtained on the official website: www.wessa.org.za

¹⁷ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

¹⁸ Further information can be obtained on their official website: www.mmaep.co.za

¹⁹ Anisa Khan, National Eco-Schools Coordination, 22nd Feb, 2012

²⁰ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

²¹ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

²² Bridget Ringdahl, National Eco-Schools Coordination, presentation at WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th Feb, 2012

²³ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

The vision of the Eco-Schools programme is to improve teaching and learning practices towards sustainability in South Africa, and developing an extensive networking hub for teachers in terms of capacity building. Furthermore, the Programme aims to support whole school development and continuous education, through establishing robust relations between learners, teachers and parents, thus becoming beneficial for all communities²⁴. With the help of five broad themes “*Community and Heritage, Healthy Living, Nature and Biodiversity, Local and Global Issues, Resource Use*”, Eco-Schools aim to increase participation and create active and critical citizens²⁵. Participant schools are required to document their Eco-Schools process as portfolios. Submitted portfolios have to indicate and prove the amount of involved active learning practices (i.e. excursions, school clubs, improved school grounds etc.), as well as participation in enquiries and active learning sessions, audits, fieldwork etc.

The Eco-Schools Programme is a not-for-profit initiative; meaning that schools participate for the sake of environment, education and the welfare of the community, which is one of the biggest assets of the programme²⁶. The ultimate aim of Eco-Schools is to develop an ethic for children, raising citizens who are grounding their actions in respect to environment²⁷.

Fieldwork associated with this research has been mainly conducted in Howick, in the KwaZulu-Natal Province of the Republic of South Africa. This is the location of the Eco-Schools Programme national coordination office. Certain school visits also took place in the Edendale district in Pietermaritzburg, in Durban and around Howick’s outskirts.

4. Methodology

4.1. Research Approach

Examining social processes, key actors, communication and interaction between participants and accordingly “[...] *gaining experience through exposure to a particular phenomenon*” (Timmons & Cairns, 2009, p. 100) will be the priority of this research. In order to provide a better understanding and description of the particular social and environmental context that I experienced, and to answer the research questions more accurately, qualitative data from research participants and the surrounding environment were required. This brought me to adopt qualitative research as my research strategy (Bryman, 2008, p. 366-368).

²⁴ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

²⁵ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

²⁶ Bridget Ringdahl, Information Seminar about Eco-Schools, Winston Park Primary School, 24th Feb, 2012

²⁷ Bridget Ringdahl, Information Seminar about Eco-Schools, Winston Park Primary School, 24th Feb, 2012

4.2. Epistemological and Ontological Considerations

The research has been conducted in an ethnographical context that I was not familiar with at all. In this regard, it was expected that my perception of reality was dependent upon my experiences, including cultural interactions and verbal communication with social actors, participation in associated workshops and sessions and observations of the educational system (Bryman, 2008, p. 18-20). Furthermore, the adopted theoretical framework entails investigating learners' abilities and opportunities to construct their own knowledge in relation with their experiences, as introduced above. Accordingly, the ontological approach of the research may be defined as "constructivism", which is explained in the following way by Bryman (2008, p. 19): "[...] *social phenomena and their meanings are continually being accomplished by social actors*". This is complemented by Khagram et al. (2010, p. 392), who states that "[c]onstructivism seeks to explain and understand how reality is constructed through social and natural processes".

"Active involvement in reality construction" (Bryman, 2008, p. 21) was one of the primary tenets of Dewey's pragmatism, which touches on alternative modes of reality interpretation depending on the context, as discussed in the theoretical section above. Accordingly, the knowledge generation process of this research is substantially correlated with my personal experiences, communication, perception and interaction with the environment and social actors, but also documents and language (Klein & Myers, 1999). Thus, the epistemological position of the research can be stated as "interpretivism" which Bryman defines as "[...] *grasp [of] the subjective meaning of social action*" (2008, p. 16). This implies understanding a certain context through individuals' point of view and their "*shared views*" (Khagram et al., 2010, p. 391) via inter-personal dynamics.

4.3. Research Design

This study represents a certain case, and includes personal experiences, involvement and reflections (McTaggart, 1999). The case study focuses on a single organisation, research being conducted South Africa in cooperation with the WESSA/WWF Eco-Schools Programme and other partners. Thus, the research design consists of a single exemplifying case study. In particular, Yin (2003, p. 41) suggests that exemplifying case studies are useful in terms of reflecting on the everyday activities of participants, and also being informative for other researchers or organizations that are interested in the particular context. Also, Bryman (2008, p. 56) points out that the

"[r]ationale for selecting exemplifying cases is that this allows the researcher to examine key social processes. For example, a researcher may seek access to an organization because it is known to have implemented a new technology and he or she wants to know what the impact of that new technology has been"

In this regard, adopting an exemplifying case study as the research strategy is expected to demonstrate detailed information regarding the performance of the Eco-Schools

Programme, in relation with sustainability education practices based on the active learning framework.

4.4. Research Methods

An investigation of the implementation of the Eco-Schools Programme in and around Howick through school visits and personal interactions were the practices that predominantly allowed me to reach my key concerns to raise. I also participated in various workshops about improving the quality of the Eco-Schools Programme (including learning from best practices, teacher capacity building and developing leadership and excellence in schools).

4.4.1. Data Collection and Analysis

Taking into account that I am coming from a considerably different background and do not have experience with children and teachers, an initial literature review was conducted in order to familiarize myself with the educational context and relevant philosophies, before the actual fieldwork. Fieldwork was conducted for approximately one month, February 2012, in South Africa. Fieldwork related data collection encompasses verbal interactions with learners, teachers and educators through interviews, as well as direct observations of their school environment, educational practices and daily lives. A review of associated documents and texts relevant to the Eco-Schools Programme was also conducted throughout the fieldwork process (Olson, 2009; Mordock & Krasny, 2001; Yin, 2003, p. 86). Since intended diverse data cannot be collected through a single method, the data triangulation technique has been adopted (Silverman, 2000, p. 98-99; Ragin & Amoroso, 2011, p. 131-132). This choice allowed me to “[u]se multiple sources of evidence” (Yin, 2003, p. 97) and increase the chance to reflect on the very specific context and present the unique data collected (*ibid.*, p. 97-101).

During the fieldwork process, I was introduced by educators from the Eco-Schools Programme in each school we visited. Thus participants were aware of my researcher identity while I was observing or interviewing them, which set my role as “*observer-as-participant*” (Bryman, 2008, p. 410-411).

The main objective was learning about the particular environmental and cultural context, and presenting the findings in detail as much as possible. In this sense, data collected through the aforementioned techniques is presented through the narrative form. Narratives have been chosen as they allowed the researcher to give meaning to a certain cultural context, and to explain it to wider audience in detail (Silverman, 2000, p. 124). Deployed narratives are grounded in personal experiences, which include activities, observations of physical spaces, notes from conversations, personal inputs and feelings, as suggested by Olson (2009). In order to reduce the risk of missing certain practices, impressions and physical details, narratives are supplemented by quotes from interviews and photos taken in relevant locations.

The detailed data collection methods used throughout the research process are as follows:

4.4.1.1. Literature Review

As the data collection process was predominantly based on personal experiences in the field, observations and interactions with research participants, the literature review associated with this study has been conducted in terms of constructing mostly methodological approaches and the theoretical framework. The literature review was also used to contextualize the research through reviewing previous studies and their implications. In particular, a review of numerous books, articles, journals and other online data sources; certain sustainability education activities; previously applied techniques; the education background in South Africa; appropriate theories in the literature; and convenient methodological approaches, were gathered and adopted as a part of this research.

4.4.1.2. Interviews

Interviewing was the most useful technique in order to learn about sustainability education in primary schools in the case study area. This was due to the limited time I had for field research in South Africa. Interviews were also convenient in terms of conveying participants' personal inputs, ideas, challenges and experiences and insights, along with the narratives that daily lives, dialogues and interactions brought. In this context, participants consisted of teachers; principals; co-teachers working with schools; educators working with WESSA and other partners; workshop participants; and learners. Interviews were initially designed as semi-structured, including different questions for both educators and learners (See Appendix 1). However, although beginning as semi-structured, most interviews developed as unstructured (Bryman, 2008, p. 437-439), due to naturally occurring data and the changing content of the topic in relation with different contexts and perspectives. As Silverman points out (2000, p. 124), interviews are remarkably effective in terms of collecting cultural narratives and particular stories; as well as in making them explicit and understandable in a wider context for any audience.

4.4.1.3. Observations

Taking part in Eco-Schools based active learning methods, primarily allowed me to see the techniques that educators are using, along with observing the participation, response and interest of learners. When the educators did not perform any activity, I had the chance to see the learners' daily lives, physical environment, schools' education resources and the progress of the already implemented practices.

As Lyons Higgs & McMillan (2006) pointed out, during my school visits, educational activities; learners' and teachers' attitudes and reactions; social interactions; and physical spaces such as classrooms, school grounds, and gardens, have been observed. While interviewing participants during events, certain school meetings, workshops and seminars have also been observed in terms of their content and contribution. I tried to

document these observations as much as I could through photos, videos and a daily logbook, which includes my personal reflections and detailed descriptions, as suggested by Gambold (2009).

4.4.1.4. Document Analysis

Relevant documents pertaining to the Eco-Schools Programme and the South African educational system, accessed during the fieldwork process, have also been analyzed. These consisted of curriculum documents; workshop and seminar notes; educational workbooks; Eco-Schools Programme reviews and relevant evaluation documents; as well as newsletters, informative brochures and online information sources provided by Share-Net²⁸. In addition, Eco-Schools portfolios prepared by learners and teachers through personal inputs and aesthetic contributions, which provide evidence of active learning in relation with environment and sustainability, were also analyzed. Accessing a wide range of documents with the help of educators and WESSA staff ultimately contributed to a more holistic understanding of environmental education techniques, the curriculum structure and contemporary challenges in the South African context.

4.5. Ethical Considerations

Focusing on children might be challenging in terms of ethical issues in certain topics. However, within the scope of this research, it is not intended to achieve confidential results pertaining to educators, children's or any other participant's private life. Participant confidentiality was not a problem, since interview questions were designed to relate to sustainability education, and observations took place in the school environment, together with educators. The Eco-Schools documents I reviewed and other books were all in public access and WESSA staff was informed regarding my research and resource use in order to avoid any confidentiality problems that might occur. Nevertheless, in order to provide a transparent and an ethical research, "*assuring student confidentiality*" both in photos and interviews is essential and necessary (Smith-Sebasto & Obenchain, 2009, p. 52).

In this regard, as suggested by Silverman (2000, p. 200-201) all participants were informed about the research content, asked for voluntary contributions, and as far as learners are concerned, further information was provided in order to make sure that they understood the context of their participation. The entire data collection process was conducted with the help and guidance of Eco-Schools educators and schoolteachers, thus it was a transparent process in spite of a major change in scope and interest in relation with the local context. Even though all the school visits and interviews took place with the consent of teachers and under the observation of educators, I asked consent from the available contacts via email in relation with their statements.

²⁸ Share-Net: The department that is responsible for educational publications within WESSA. <http://www.sharenet.org.za/>

4.6. Validity and Reliability

In the beginning of the research design process, I aimed to study active learning and teaching techniques in the educational field and its impacts on learning local and global sustainability challenges further, as introduced above in relation with my theoretical standpoint. However, after contacting associated staff and conducting the literature review, I found that the South African office of the Eco-Schools Programme already reaches numerous schools, educators and learners with the same objective. This is along with trying to improve the education quality and environmental consciousness through implementing active techniques. The Eco-Schools Programme has been active in South Africa for ten years²⁹. Hence, discovering that they already have been performing what I had in mind to perform by myself, I decided to re-design my research and learn from their opinions, experiences and success stories throughout their Eco-Schools journey in the South African context. Therefore, the case has been selected through “*theoretical sampling*” due to its desirable characteristics and compliance with a pre-determined theoretical approach (Silverman, 2000, p. 105). Deciding the theoretical framework of the study from the early stages of the literature review, and accordingly determining the case in line with adopted theories, was a critical process that I believe contributed to the “*external validity*” of the research (Yin, 2003, p. 37).

Increasing the diversity of the data sources and eliminating dependency on a single type of data is considered as an asset in terms of “*constructing validity*” (Yin, 2003, p. 35) of the research. Thus the data triangulation method was adopted (Bryman, 2008, p. 377). Furthermore, data collection was dependent upon on personal experience and direct participation; hence, it is expected to eliminate the potential bias stemming from proxy.

Participating in different activities, observing respondents’ daily lives and working with professional educators allowed me to continuously test the data I obtained (Olson, 2009) within similar contexts and modify my findings in time. Along with the aim to present trustworthy research, the aim was also to conduct authentic research (Bryman, 2008, p. 379), which is very specific to a certain context. Due to this specific context and characteristics of a single case design, findings cannot be generalized. However, since the South African Eco-Schools Programme is a part of a global initiative, other countries that are part of this network might learn from each others’ success stories, avoid common mistakes and improve the gaps. Therefore, certain approaches can be applied elsewhere in-line with associated countries’ national curriculum. Specific methods can be re-designed according to local contexts, and thus it is expected to contribute to the transferability and validity of the study.

4.7. Limitations of the Study

Limitations of this study stem from mainly two points, which are time and the local context. In this sense, allocated time for the fieldwork was approximately one month, which was enough for data collection and reflecting on the initially designed research

²⁹ For further information, see <http://wessa.org.za/what-we-do/eco-schools.htm>

plan, thus re-adjusting it according to the circumstances of the local context. However, if I had the chance and means to stay longer in the field, I would immerse myself in the events and daily lives of the social actors, educators and learners, that provide the basis for this study (Bryman, 2008, p. 402).

As authors Johnson & Manoli (2010) and Conley Tyler et al. (2008) also noted, interaction with participants from different ethnic backgrounds, and thus different lifestyles, culture, perceptions and language, caused some problems during the data collection process. My chances of collecting more learner-based, in-depth data, was constrained especially in the context of interactions with younger learners, who are exceptionally withdrawn, not cooperative and with limited English capabilities. In this regard, most of the learners answered my questions with the direct or indirect observation of their teachers, since they have not participated in similar research before and interview questions possibly made them feel as if I was testing their academic knowledge, thus they were nervous in the beginning. Also, it was impossible for me to follow the inner dynamics or the content of conversations between learners, since almost all the children participants were isiZulu speakers.

On the other hand, I had to follow the schedule of the educators or partners I was working with, therefore, I was not able to fully implement activities or other research related practices that I had in mind before the fieldwork. Similarly, crowded classrooms, outdoor environment noises and other volume related factors render the very limited audio records I had almost impossible to understand. Hence, I had to rely on my memory, daily kept logbook, videos, and relevant notes in the field.

5. Results and Analysis

In this chapter, the results of the fieldwork will be presented.

5.1. Impressions from the South African Educational System

During the data collection process, in relation with the research aim and questions, one of the most significant impressions I have gained was regarding South Africa's exceptional social and educational context. What makes the results more rich and specific is the historically long-lasting impacts on the contemporary education system, of the social disruptions resulting from the unequal allocation of social resources under Apartheid. Even within the limited scope I became familiar with (the town of Howick and surrounds) the educational quality is overshadowed by various problems in the social sphere. Accordingly, I decided to present the results in relation with these main points – problems in the educational realm in South Africa, and problems in the social sphere and resulting impacts upon education. Following that will be a presentation of the results in relation with the impacts of active learning on children's contribution to problem-solving of local sustainability concerns, and their knowledge of global sustainability issues.

5.1.1. Problems in the Educational Realm

5.1.1.1. Teacher Distribution

As far as sustainability education is concerned, a lack of educational resources and existing problems in accessing them render schools the only source of education. In spite of schools' crucial position, primary education in South Africa is deteriorating due to political, social and organizational mistakes. In this regard, I had the chance to discuss these problems during a visit to Corrie Lynn Primary School, accompanied with Eco-Schools and MMAEP educators and guest representatives from the Uganda Eco-Schools Programme. This allowed us to mingle with teachers, listen to their concerns and professionally evaluate their words from different perspectives.

Corrie Lynn is an under resourced and semi-urban school, which is located on arable lands on the outskirts of Howick. I am going with one of the schoolteachers into her classroom. The sitting scheme is arranged according to learners' grade. Grade 5 – 7's are taught together due to lack of teachers in the area. When I asked her about the problems she was facing, she pointed out the necessity for more teachers, telling me how she teaches all these different grades together. She tries to find common topics in the curriculum, aiming at the level of Grade 7's and spending extra time with Grade 5's. As it can be seen from this example, the distribution of teachers is a major problem in South Africa. This is often because teachers prefer working in urban areas, with few teachers remaining in rural communities.

In order to answer my questions and those of the Ugandan Eco-Schools representatives, and to make us more familiar with the educational context in South Africa, myself and the aforementioned educators gathered in the small library of the Corrie Lynn Primary School. Some of the prominent points of the discussion were the assertion that young people do not see being a teacher as a career anymore, and that parents send their children to urban schools from the rural areas they are living in, with the notion of providing them with better educational standards. As a result of this, urban schools are dealing with crowded classes and insufficient resources for learners, and rural schools are shrinking, just as in the case of the Corrie Lynn primary school.

5.1.1.2. Resource Access, Allocation and Teachers' Approach

Resource access and allocation is a serious issue that teachers and learners have to cope with. In this sense, some schools are considerably under-resourced, and finding additional learning materials for children is very problematic. The principal of Hawkstone Primary School, a rural farm school, stated that: *"We do not have DVDs, CDs and internet, so even though we want to improve students' understanding of environmental issues we cannot do it in the level we want to"*. However, numerous schools, including Hawkstone Primary School, have learnt to harness these problems as a motivation to enter environmental competitions, where winnings may contribute to improving school resources. Entering these competitions is also seen as a reason to improve teaching and learning practices as well.

Experts stress the necessity of adopting comprehensive and multi-faceted approaches in order to promote children's education on a national level, which would ultimately contribute to an improvement of the overall educational quality³⁰. Dr. Nick Taylor³¹ argued for the role of professionalism, along with focusing on basic subjects of education, such as increasing literacy and numeracy. For this purpose, he indicates the significance of procurement and deployment of associated materials such as books, and emphasizes the importance of basic learning skills: *"Learning is carried by language [...]. Reading is the key point"*. Similarly, Rob O'Donoghue, Professor of Education at Rhodes University, states: *"Without language, ideas will get lost. Mediated language will facilitate understanding [...]. In all of the cultures in South Africa, stories are prominent ideas"*³².

The presence of committed, dedicated and knowledgeable teachers, who think out of the box, is crucial in terms of developing the basic skills of primary school learners. While some of the educators and principals say that they have been limited by their job descriptions, they also complain about the passive, uninterested and stubborn behaviour of certain teachers, which restricts potential collaborative, accountable and constructive educational movements³³. In this context, there is an important question to be raised: *"How do we support teachers who have been isolated for many years?"*³⁴

It was discussed at the WESSA Eco-Schools workshop that teachers who spent a long time without textbooks and struggled with the changes and amendments to the curriculum, should be supported by providing appropriate teaching materials, allowing them to develop their teaching resources and supporting them during this recent curriculum transition process to CAPS. Thus, monitoring and evaluation steps associated with teacher materials and curriculum development must be prioritised in the following years³⁵.

5.1.2. Problems in the Social Sphere and Resultant Impacts on Education

Historical discrepancies in South Africa also dominated the educational terrain. Under the name of separate education during Apartheid, white and black people were exposed to considerably different educational standards³⁶. Even though South Africa currently invests more in education, it scored even lower in numeracy and literacy skills than under-developed African countries, due to problems inherited from Apartheid-era

³⁰ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

³¹ Dr. Nick Taylor, Senior Research Fellow at "Jet Education Services", presentation at Red Cap Schools: Schools of Excellence Workshop, Durban, 20th Feb, 2012

³² Rob O'Donoghue, presentation at WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 7th Feb, 2012

³³ Red Cap Schools: Schools of Excellence Workshop, Durban, 20th Feb, 2012

³⁴ Rob O'Donoghue, presentation at WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 7th Feb, 2012

³⁵ Anisa Khan, presentation at Eco-Schools Workshop for Teachers; Agriculture, Environmental Affairs and Rural Development Department; Province of KwaZulu-Natal, Durban, 17th Feb, 2012

³⁶ Anisa Khan, presentation at WESSA, Workshop for Eco-Schools Representatives from Uganda, Umgeni Valley, Howick, 22nd Feb, 2012

education and contemporary cultural differences³⁷. In order to address South Africa's major social problems, CAPS encompasses seven principles: *“human rights, environmental and social justice, credibility and efficiency, critical learning, inclusivity, quality and social transformation”*³⁸. Educators defined inclusivity as: *“Everyone should be a part of the education system even though there are language or other barriers for children's learning”*³⁹. In this sense, the main trouble of South Africa is having eleven official languages. When children cannot read in their native language, or cannot learn English, they are deprived of words, thus they are not able to experience reading and construct knowledge⁴⁰. This will be discussed in more detail below.

5.1.2.1. Language Barrier

Language is a major problem among numerous learners in primary school level. South Africa has eleven official languages and young learners start primary school at the foundation level in their native language, and are expected to switch to English at Grade 3 – 4. In this regard, I personally experienced the language obstacle in different contexts. In the Khethindlelenhe Primary School, located in Edendale, Pietermaritzburg, learners are isiZulu speakers and English is their second language. Thus, they were exceptionally shy, silent and not self-confident about English language use. School is the only environment for these children to learn and practice their English, hence it was challenging to interact with them and get clear responses while their teacher is speaking isiZulu with them during interviews. Similarly at Sifisesihle Primary School, which is located approximately fourteen kilometres away from Howick and is a high crime area, children were also isiZulu speakers and speaking/understanding English occasionally was problematic. Throughout the activities the Eco-Schools educator was giving instructions in English and a co-teacher was translating these to isiZulu. On the other hand, at Hilton Intermediate School, even though learners were isiZulu speakers, their English was remarkably better than the other schools I have visited, due to teachers' particular effort and encouragement towards speaking English. However, the language barrier is not just the problem of learners, but also of teachers. Eco-Schools educators drew attention to communication troubles of Afrikaans or isiZulu speaking teachers as well in Northern Cape and elsewhere in the KwaZulu-Natal province⁴¹.

5.1.2.2. HIV/AIDS, Orphans and Poverty

During the school visits in Edendale, on the outskirts of the city of Pietermaritzburg, the Eco-Schools educator gives me an overview of the area. These are poor suburbs of Pietermaritzburg and the percentage of orphan children is quite high due to HIV/AIDS.

³⁷ Bridget Ringdahl, presentation at WESSA, Workshop for Eco-Schools Representatives from Uganda, Umgeni Valley, Howick, 22nd Feb, 2012

³⁸ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

³⁹ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

⁴⁰ Rob O'Donoghue, presentation at WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 7th Feb, 2012

⁴¹ Western Cape Province Eco-Schools Coordinator, presentation at WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th Feb, 2012

Social problems, along with environmental problems, within communities here are significant. Educators try to explain to primary school learners about how environmental and social problems are interrelated in their visits. The Henryville Primary School is one of the schools located in this area. When asked about social problems in this community, Siyabonga Sibiya, the teacher of Grade 7 learners⁴², states: *“We definitely have big challenges. In this school, 30% of students are orphans and 20% of them have single parents”*. Similarly in Hilton Intermediate School, some children live with their relatives or grandparents; they do not have parents and even some of them do not have water or electricity at their households.

Sifisesihle Primary School is another school, which experiences similar social problems. Along with high HIV/AIDS rates in the local community, orphans start living by themselves or with their relatives from early ages, in some instances joining criminal gangs within the neighbourhood. Sometimes even twelve year olds do jobs (i.e. rob houses) for these gangs to earn some money⁴³. Along with help from social services, educators also try to support learners, through encouraging them to use the school garden for food to take home and by spending time with them in the gardens. On the other hand, most of the learners are short of clothes and school uniforms, so teachers from the community try to re-use clothes and communicate with other members of the community in order to find clothes or other school resources (such as books and pencils) for those who are in need⁴⁴. Ntombenhle says:

“I often talk to teachers about treating students better, not beating them or yelling at them in front of everyone. They say they do not have time, but that children have nothing and teachers should treat them that way. I mean when a child comes to school without uniform, there is no point shouting at them, because that child obviously could not afford it. We should focus on helping them instead of yelling at them.”

Similarly, Nqobile Nyoni, who is originally from Mozambique and the teacher of Grade 6 within the same school, complained about problems stemming from having different ways of looking at education from his colleagues from South Africa. As it can be seen from these examples, teachers and educators might hold rather different opinions on approaching young learners and parental involvement to a higher extent is necessary for supporting children’s education pro-actively and continuously, including after-school⁴⁵. This is significantly hindered by high orphan rates. Thus, teacher dedication and involvement becomes a crucial factor in terms of making the best of the situation. In spite of differences in the cultural context, as well as difficulties in rural conditions and

⁴² In Grade 7 students are 12-13 years old, but there are some students around 16 years old who have problematic backgrounds.

⁴³ Interview with Ntombenhle who is a co-teacher from the same community and she works with MMAEP for Eco-Schools.

⁴⁴ Interview with Ntombenhle who is a teacher from the same community, also working with the MMAEP for Eco-Schools.

⁴⁵ Red Cap Schools: Schools of Excellence Workshop, Durban, 20th Feb, 2012

poverty, it has been concluded that committed teachers are able to make change happen and achieve better results than in more affluent schools⁴⁶.

In most cases environmental issues are clearly not the priority of the schools; people are demotivated and there is a need for encouragement due to poverty and other social problems. Educators and learners have difficulties in achieving higher results when there is a lack of resources (i.e. books, pencils, desks, blackboards etc.), a lack of time and a lack of dedication⁴⁷.

5.2. The Eco-Schools Approach to Sustainability Education within the Case

“People learning to change most are ‘doing’ the most not ‘saying’ the most.”
Jim Taylor⁴⁸

As far as sustainability education is concerned, achieving quality education here requires upgrading the poor understanding of sustainable development among educators, as well as supporting the basic needs of learners as also mentioned in Eco-Schools workshop. Also, gaps between different stages of education prevent the ultimate goal of taking action for the sake of the communal environment. In this sense, after teachers provide information, learners should continue educational practices with purposeful experiences and improve their local environment through active participation in problem solving (Rosenberg, 2009, p. 4-5). Therefore, teachers must collaborate better with other educators and learners in order to reconcile different ideas based on textbooks, lectures and experiences (*ibid.*, p. 6).

“Teachers being knowledgeable is not the problem, what fails in the South African context, is that of teachers being constructive” says professor Rob O’Donoghue⁴⁹. Similarly, teachers often fail to explain reasons behind environmental conservation activities. Even though children become familiar with environmental issues in their social context, schools fail to design meaningful activities, evaluate the results of the tasks and conduct monitoring and assessment, in part due to a lack of time. Hence, children are becoming isolated from their peers due to non-collaborative schedules and poorly incorporated praxis, thus finding themselves in an overwhelmingly competitive environment. Before constructing a meaning from activities, they are forced to start immediately on a new topic due to time shortage⁵⁰.

⁴⁶ Red Cap Schools: Schools of Excellence Workshop, Durban, 20th Feb, 2012

⁴⁷ Limpopo Province Eco-Schools Coordinator, presentation at WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th Feb, 2012

⁴⁸ Jim Taylor, Director of Environmental Education at WESSA

⁴⁹ Rob O’Donoghue, presentation at WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 7th Feb, 2012

⁵⁰ Rob O’Donoghue, presentation at WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 7th Feb, 2012

“Children’s education level or awareness considerably differs even in small contexts. For example, generally in under-resourced rural schools and in isiZulu speaking communities, the level of education is significantly lower.” says Shari Cade⁵¹. Schools are in different levels of development, hence it is impossible to generalize their conditions, and especially the contextual conditions of South Africa makes it even more difficult, something that was also pointed to by Eco-Schools educators. In particular, regarding environmental challenges; in the remote and rural areas, children are not well educated about these problems. A teacher in a remote isiZulu speaking community near the Drakensberg Mountains states:

“I was going to go to Durban for attending COP17, and when I told this to my students, they asked what was COP17. So, I had to tell them all about global warming, greenhouse gases, emissions and fuels and what is going to be discussed in COP17 from the very beginning, and unfortunately these are high school students who do not know any of these, almost adults!”

Bagada Peace, the Eco-Schools Coordinator from Uganda, states perhaps what is on all Eco-Schools coordinators’ minds and hearts in a most sincere and plain way: *“We are rescuing tomorrow by using today”*. Eco-Schools educators aim not to make things uniform, but to learn from each other’s best practices and increase the quality of the programme, through being reflexive in different contexts⁵². Practical projects may be demonstrated as to where Eco-Schools are successful and teachers can grasp the meaning of these techniques and make broader links, contributing to the development of children as inquiry learners and curious citizens⁵³. In this regard, finding innovative ways to make do with available resources and supporting teachers through workshops and capacity building seminars throughout the process is essential.

Eco-Schools educators base their approach on the active learning framework in order to allow learners to work on projects, which are expected to extend their knowledge in an innovative way. Thus accessing information through multiple steps, including knowledge building, application of what has been learnt and analyzing the particular action, are considered as a part of the Eco-Schools methodology⁵⁴. In this case, making schools comfortable places where children can learn and shaping their attitude by language and practice is necessary. Since there is a serious infrastructure problem in numerous schools (i.e. no blackboards or desks), it becomes challenging to talk about environment and experiential education. Eco-Schools educators learnt to take teachers through iterative steps, building knowledge according to children’s interests and curriculum needs. In this regard, focusing on a certain issue for a pre-determined period of time (i.e. water, wetlands, climate change), helping teachers with content

⁵¹ Shari Cade, Education and Reserve Manager at Umgeni Valley Nature Reserve, WESSA

⁵² Representative from Delta Environmental Centre, Johannesburg, presentation at WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th Feb, 2012

⁵³ Eco-Schools Workshop for Teachers; Agriculture, Environmental Affairs and Rural Development Department; Province of KwaZulu-Natal, Durban, 17th Feb, 2012

⁵⁴ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

management and facilitating their own learning by trying out something new in a collaborative way, is essential to the Eco-Schools' agenda⁵⁵.

According to Professor O'Donoghue, providing multiple learning materials for learners, especially for those who are not economically capable, as well as stimulating them in terms of reading, writing and taking action, should be the priority of the Eco-Schools programme. He also states that “[c]hildren read in order to begin their ideas and they write in order to clarify them. Being in language and activity allows one to understand”⁵⁶. Similarly, Eco-Schools educators highlighted that older generations grew up with narratives, but today's children are not equally attached to cultural values as it used to be in the past. In this sense, Eco-Schools helps teachers and parents to establish a connection between learners and nature again, bringing back the disappearing cultural knowledge, which can contribute to addressing local environmental problems⁵⁷. This is through utilizing the “culture and heritage” theme, and ultimately stimulating learners to appreciate their environment and cultural heritage⁵⁸, along with contributing to their basic education skills.

Stories are widely considered as amongst the best ways that children become inquiry learners in South Africa. This means becoming active learners who are questioning the broader linkages of particular information. One of the successful projects conducted by the MMAEP node of Eco-Schools is the library project, which started with the idea that “*Readers are thinkers, doers, agents of change*”. In order to improve literacy levels in primary schools and create a vibrant reading environment, educators teach about environmental concepts through games and reading children books. Within this relaxed and fun atmosphere, children are motivated to read more, take responsibilities (i.e. having access to computer for library mentors) and be creative through decorating libraries and other art designs in order to create ownership⁵⁹. Similarly, Scilla Edmonds, Principal of The Birches Pre-Primary School, writes storybooks for children about the environment, plants and animals⁶⁰, presenting educational narratives with environmental content, supplemented with photos, both in English and isiZulu. Some of her books have received awards. Other node coordinators also frequently run projects that encompass creating an environmental newspaper share pool in school, giving booklets about animals/plants and using old books to make puzzles for children, through cutting them into pieces and making children re-build them, allowing them to read at the same time.

⁵⁵ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

⁵⁶ Rob O'Donoghue, presentation at WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 7th Feb, 2012

⁵⁷ I.e. Experts indicate that certain kind of plants and plantation type is highly correlated with the amelioration of soil and increases yield which has been practiced for decades by Zulu communities

⁵⁸ Eco-Schools Workshop for Teachers; Agriculture, Environmental Affairs and Rural Development Department; Province of KwaZulu-Natal, Durban, 17th Feb, 2012

⁵⁹ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

⁶⁰ Title of the three of the books I had accessed and read: “The Story of Sunshine Farm”, “The Salad Party” and “Hadedas Discover Biodiversity... Under the Camphor Tree”

Apart from the activities aim to increase the literacy skills of learners, educators also collaborate with wildlife sanctuaries and national parks, contact companies like Tetrapak and Nampak for recycling activities, or invite guest speakers for informing both learners and teachers about their experiences, inspiring through real life stories⁶¹. In this regard, experiential education uses games, dramas, pictures, stories and even lifestyle changes and is expected to offer a new perspective for both learners and teachers.

Adjusting the school feeding scheme in relation with nutrition and healthy diet as part of the life orientation subject in the curriculum is one aspect of active learning within the Eco-Schools framework. The Hawkstone Primary School tried various practices in this context. For example, they stopped junk food being sold at school and motivated learners to buy fruits and peanuts instead of chips. The school principal explains how they started these practices: *"I saw some of the children had teeth problems or extracted teeth and then I banned junk food selling at school, I am older than them but I do not have teeth problems-they should eat healthy food!"*. He also refers to life orientation class within the curriculum, which covers nutrition and healthy food consumption and states: *"We had to practice what we have preached within classrooms"*. Corrie Lynn is another primary school where children were consuming junk food in the beginning of their Eco-Schools process, seven years ago. Now they are growing their very own vegetables in the school garden and consume nutritious food. Hilton Intermediate School children learn about natural foods and modified ones and their energy contribution to metabolism with the assistance of MMAEP educators.

Educators frequently use gardening and permaculture in order to explain the benefits of locally grown, organic food, along with discovering biodiversity. Hawkstone Primary School use Eco-Schools as a hub to communicate with other schools in order to exchange plants and seeds for improving their school gardens. Learning the theory in the classrooms, followed by an experiential process – examining bugs, planting trees and classifying leaves clarifies their learning. *"When they see and feel, they learn better"* says the school principal. One of the teachers adds that: *"In the garden dig, there are different types of soil and children do different kinds of experiments when they are digging soil: seeing those organisms, colours and other small details which make it real for them"*.

In Sifisesihle Primary School, MMAEP educators conduct activities regarding the functions of herbs (i.e. edible, medicinal) that are collected from the school garden. They try to develop the learners' perception of gardening and growing vegetables through competitive activities and stories, aiming to motivate them to expand these practices into their communities (see Figure 1). The Birches Pre-Primary School uses treated gray water for watering plants in the permaculture garden, which comes from kitchen and bathrooms and treated in self-built tyre-pots through gravel and sand filters (see Figure 2). They also arrange permaculture courses for parents on the weekends. Last but not least, Kainon School has well-organised gardening activities through intensive parental involvement and a vegetable garden.

⁶¹ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012



Figure 1: MMAEP Educator helping learners to define herbs in school garden



Figure 2: Tyre-pots in permaculture garden

Art campaigns including calendars, posters and handcraft that are organised by Eco-Schools, government offices and other initiatives are adopted as a part of awareness campaigns throughout South Africa. When learners' art is featured on nationally distributed posters or when they win prizes, it both motivates children and teachers, but also significantly contributes to increasing awareness (see Figure 3). Along with increasing creativity and underpinning sustainable lifestyles, another significant outcome of art projects related with environment (i.e. creating objects with used, recycled materials) is the contribution to conscious citizens starting from early ages. For example, while in general learners at the pre-primary level are not familiar with all concepts, The Birches Pre-Primary School learners are very advanced when they come to primary and high school level compared to their peers, in relation with the extensive environmental content they are exposed to from early ages⁶².



Figure 3: Winner of an art competition

5.3. How Children Engage with Local Sustainability Problems Through Eco-Schools Education

In order to increase capabilities and environmental literacy, the Eco-Schools Programme developed a strategy based on the motto; *"a capable eco-school should know how to respond to an environmental problem in the community"*⁶³. This approach is expected to lead primary school learners along a path that stimulates them to start discovering from known to the unknown⁶⁴, including words, characteristics of the surrounding environment and possible actions to protect it. Also, the Programme hopes that incorporating local sustainability issues into the curriculum activities will

⁶² Information Seminar about Eco-Schools, Winston Park Primary School, 24th Feb, 2012

⁶³ Anisa Khan, presentation at WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th Feb, 2012

⁶⁴ Rob O'Donoghue, presentation at WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 7th Feb, 2012

significantly contribute to the development and implementation of practices according to the needs of local areas⁶⁵, as well as motivate children to value the environment starting from early ages.

“Over the years we developed a theoretical aspect through being inspired from our practices about teacher and student development.” says MMAEP node coordinator Charlene Russell. In cooperation with teachers, government officials and other partners; numerous learners benefitted from the unique features of their local environment through educational activities that are grounded on experiencing and learning to conserve. Educators are constantly working on developing communities of practice and improving sustainability education quality in various ways. The exceptionally diverse and abundant environmental resources of South Africa allow educators to teach the “local environmental problems” concept in a most vivid and experiential way.

In this sense, Northern Cape is the province where the most dense lichens grow in whole of South Africa, therefore, children are being taught about this vegetation and why, how to conserve it as a part of their classroom activities⁶⁶. Similarly, the Drakensberg Mountains located in KwaZulu-Natal is one of the most biologically diverse spots of the world, and a UNESCO World Heritage Site. Educators working in this area arrange school trips to nature reserves in order to show/tell children about forest fires, poaching and the importance of small scale conservation activities⁶⁷. Schools with a lack of resources or the ones located in the city centres are improving their practices in primarily school gardening and permaculture in relevance with lesson plans. In this sense, learners are being encouraged to do permaculture design and extend the school practices into their houses or communities as farming or gardening. In addition, planting trees; feeding and conserving birds; visiting dams and local water reserves; outdoor nature activities such as bird, frog, and insect watching; recycling and gardening projects; and visits to local coffee and other producers, learning to support locally grown food, are some of the activities that Eco-Schools are facilitating.

Kainon Schools in Durban is a private school, which is located near to a nature reserve, and the school takes advantage of their location through fieldtrips. Also, activities such as replacing alien vegetation through planting indigenous trees (Figure 4), interpreting consumption habits through used objects and recycling in cooperation with the YES recycling company (Figure 5) provides children with a convenient atmosphere for learning, also stimulated by high parental involvement.

⁶⁵ Anisa Khan, presentation at WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th Feb, 2012

⁶⁶ Northern Cape Province Eco-Schools Coordinator, presentation at WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th Feb, 2012

⁶⁷ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012



Figure 4: Indigenous tree plantation



Figure 5: Recycling station

The Birches Pre-primary School is situated in the urban centre of the city of Durban, which is a government school. Principal ‘Scilla Edmonds draws attention to the very limited amount of money they receive from government (the equivalent of one teacher’s salary). Even though The Birches is not a well-resourced school, committed and hardworking staff puts incredible work into practice.



Figure 6: Re-use of PET bottles

Particularly with ‘Scilla’s contributions, the school has an extensive recycling system and a permaculture garden in which learners can grow plants and vegetables (see Figure 2 and Appendix 3). In addition, these gardens provide the opportunity for observing frogs and birds. Furthermore, it is possible to see the smart utilization of waste materials for making art in a most creative way (see figure 6, 7 and 8).



Figure 7: Wall art from bottle caps and other waste



Figure 8: Material re-use for art

Hawkstone Primary School is a farm school which is pretty isolated and in the middle of vast farmlands. Gardening, healthy food serving and recycling are ongoing projects. The principal mentions that the school will additionally be focusing on recycling projects in relation with their aims of participating in awarded recycling competitions and generating income through selling waste. However, the principal states the obstacles they need to overcome beforehand:

“We are not like schools in town, we cannot collect too many cans because we cannot transfer them. We need for containers and to find someone who pays for papers as well”

Depending on the local needs and conditions, Eco-Schools educators motivate children to take action in different themes. In certain rural societies, there is no available municipal waste collection service, thus communities burn the waste due to a lack of alternatives. In this regard, Eco-Schools started recycling projects in cooperation with schools and sponsors, which motivated learners through school trip awards⁶⁸. In spite of the limited amount of recycling storage, some teachers and community members started recycling at home as well. Recycling is one of the most commonly implemented activities within the Eco-Schools education framework. Along with remote rural schools, well-resourced private schools are also frequently investing in recycling, and through parental input they aim to create a *“recycling hub for future involvement”*⁶⁹. Teachers from different schools state the benefits of recycling as follows⁷⁰:

“It has been fantastic to see the pupils, especially the younger children, starting to ask questions about what qualifies as plastic, or cans, or ‘white paper’ and so on.”

“This recycling has earned us so far approximately R800 worth of rebates through Wildlands, which is not much, but definitely helps us towards unforeseen or ‘dream’ costs as required.”

Along with recycling activities, children learn about plants, animals and their parts in the ecological cycle, which they can relate with their local environment through practising compost and organic material use for growing plants or vegetables in the school gardens. This often stimulated children to further question their consumption habits and lifestyle choices. Also, in some cases, learners are assigned certain tasks, which entail interviewing locals, and investigating environmental changes occurring in their community over years (land use change, vegetation, animals, human population etc.), pollution types (soil, water, air) and their reasons. Other than that, inquiries such as investigating cultural degradation and influences from other cultures are also incorporated into the Eco-Schools agenda in terms of addressing social sustainability

⁶⁸ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

⁶⁹ Portfolio research: New Hanover Prep. School, Faith-Way Christian School, St. Patrick’s Pre-Prep. School, Koppiesvlei Outdoor Education Centre, Kloof Pre-Primary School, King’s School.

⁷⁰ Quotations and information about activities obtained from Eco-Schools portfolios. The following are the schools those portfolios used as data for this research: Vukuzithathele Primary School, New Hanover Prep. School, Rainbow Eco-Home School, Faith-Way Christian School, St. Patrick’s Pre-Prep. School, Koppiesvlei Outdoor Education Centre, Kloof Pre-Primary School, King’s School.

challenges. As a response to high poverty and orphan rates, while some schools are directly helping orphanages, some found very creative alternatives. For example, children from one school have started to make handcrafts from waste and sell those in order to buy food for orphans as a part of waste management activities⁷¹.

Sifisesihle Primary School's Grade 6 learners indicate waste and sanitary problems of their school when asked about their opinions of local environmental challenges. On the other hand, Eco-Schools educator Eidin Griffin⁷² mentions that inhabitants of this community are buying basic products at inflated prices, due to distance from town and lack of facilities such as supermarkets, as well as high crime rates (i.e. the supermarkets would need mega security to hold stock). In this regard, gardening practices have become prevalent among members of the community who want to grow their own food and save money. Gardening is a part of cultural learning here and Eco-Schools activities (Figure 9) are underpinning this learning with permaculture practices and teaching learners about medicinal, edible herbs, allowing them to taste, smell and touch but also to take some food for home.



Figure 9: Edible herbs and gardening activity

Inzuzwenhle Primary School is located on the top of a hill and surrounded with mostly self-built, small and single-storey houses within the Edendale district of Pietermaritzburg. During the brief session I presented to Grade 7s, we also had the chance to discuss local sustainability problems. The primary examples they gave were the pollution of water resources, dumping, as well as health and social issues, such as alcohol abuse and poverty. Learners were aware of the significance of certain actions such as waste collection and recycling – and all of them showed ownership and responsibility as far as gardening and recycling is concerned.

Khethindlelenhe Primary School is also situated in the same district of Edendale. As mentioned before, environmental issues are not the priority of this school as well as many others sharing the same social context. Especially, after speaking with learners in person or within focus groups, it is remarkable that they were lacking adequate information about the environment and English language skills. Also, they were subjected to teacher-centred passive education and highly dependant on Eco-Schools educators for putting their knowledge to practice. Even if they participated in certain

⁷¹ Portfolio research: New Hanover Prep. School, Faith-Way Christian School, St. Patrick's Pre-Prep. School, Koppiesvlei Outdoor Education Centre, Kloof Pre-Primary School, King's School.

⁷² Eidin Griffin, Eco-Schools' MMAEP node educator

activities through Eco-Schools, educators pointed out the necessity of a paradigm shift among numerous teachers in order to make change happen.

Henryville Primary School is one of the few schools I visited that put considerable effort into prioritizing environmental problems in spite of their struggles with certain social issues. While teaching about local environmental issues, teachers firstly inform children and assign them relevant readings. When there is not enough resources or time for a field trip, they use the school grounds. Children take action in groups and try to accomplish various tasks in relation with gardening and recycling, so that they have the chance to implement classroom knowledge. Siyabonga Sibiya⁷³ explains the contribution of fieldtrips: when he shows animals and explains about them in the field, followed by a class discussion about learners' experiences, and further analysis and bringing together all their comments; they get excellent results from this technique. He also adds that:

"In the classrooms, I am only telling them about polluted rivers. But, when I take them to river Msunduzi and show them our only water resource and explain to them, if this will be polluted we will have polluted water at our homes and schools, it really makes a big difference."

5.4. How Children Engage with Knowledge of Global Sustainability Problems through Eco-Schools Education

The Eco-Schools Programme and all the associated educators are supporting the idea of earth citizenship and working towards educating the decision-makers of the future as global citizens. This is a concept grounded on understanding wider contextual and global issues, but also responding to local problems⁷⁴. Even though global problems are being introduced in higher grades of primary school, learners initially learn about general concepts and local problems, which is expected to bring a certain amount of knowledge and prepare them to study sustainability challenges in a global context (Rosenberg, 2009, p. 15). Particular organizations and companies are investing in awarded competitions in order to draw attention to global topics, such as HSBC's climate change action project. Also, COP17, held in Durban, South Africa increased the awareness and priority of climate change in teachers' eyes.

Air pollution is often used to explain to young learners the link between the local and the global environment through aerosols. Similarly, English and technology classes are also often used by educators to make connections between acid rain and air pollutants through examples from various locations of the world. Local or national level competitions choose artistic works and poster designs as a way to spread information regarding environmental problems, global health issues and climate change⁷⁵ (see Figure 10 and 11).

⁷³ See page 27 for previously introduced information about school and teacher

⁷⁴ Anisa Khan, presentation at WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th Feb, 2012

⁷⁵ Information about activities obtained from Eco-Schools portfolios. The following are the schools those portfolios used as data for this research: Vukuzithathele Primary School, New



Figure 10: Global sustainability challenges poster



Figure 11: Another poster from the same competition

As an introduction to global warming, teachers highlight the relationship between the oxygen cycle and trees; in particular, the CO₂ absorption process. Furthermore, as a way to emphasise the importance of trees, teachers provide inspiring tales that learners can contextualize in their own culture, such as the story of African brothers cutting trees for industrial purposes without planting new ones and the consequences (also see Appendix 2). Also, during my visit to Khethindlelenhe Primary School, the conversation within the group⁷⁶ was not quite moving so we found ourselves in the front yard with the two disposable cameras I provided, asking them to show their recycling practices (Figures 12). They quite enjoyed the idea and while some of them were taking photos, others started to explain the collection of paper for recycling. After our small activity, when I asked questions about recycling it was clear that teachers tell them to recycle but failed to explain the underlying reasons. So, we talked about the connection between recycling paper and saving trees (Figure 13).



Figure 12: Recycling in the school garden



Figure 13: Talking about the importance of recycling

Hanover Prep. School, Rainbow Eco-Home School, Faith-Way Christian School, St. Patrick's Pre-Prep. School, Koppiesvlei Outdoor Education Centre, Kloof Pre-Primary School, King's School.

⁷⁶ Focus group I interviewed, consisted of nine primary school learners whose age range is 12-13 and one of them is 16 years old, 14th Feb, 2012

Global warming and climate change are the most emphasized topics within classroom lessons. The majority of the learners I interviewed start responding about global warming when I asked about global problems. Likewise all the teachers I have interviewed showed a similar approach⁷⁷. Similarly, COP17 was a popular response among the interview participants in terms of indicating general awareness regarding climate change, even though learners had hard times explaining these concepts. Apart from the classroom activities, some schools plant trees and grow plants in mini-greenhouses made from re-used plastic bottles, replace bulbs with energy efficient ones, and learn about the carbon footprints of SUVs and small cars⁷⁸. Also, some of them have the chance to visit a local coffee plantation and learn about how the crops are affected due to climate change, and then children are told about Brazil (largest coffee producer) and discuss devastated coffee trees because of climate change in that region as well⁷⁹. The Hawkstone Primary School principal states that:

“We are an isolated farm school, so we do not really have local environmental problems to tell children and practise within community. But we definitely talk about global warming; we are aware of its importance and try to teach children.”

In addition to the principal’s words, one of the teachers gives an example:

“We are saying sun gives energy to world and children understood it when we make pop-corn on solar oven and when we keep the corns in the oven for long. They saw it and understand better”.

Educators state that they are covering the significance of water for all living species – and promote thinking globally in line with the curriculum through incorporating water conservation with maths and science. When asked about freshwater resources, some learners were able to indicate icebergs and glaciers, and floods as water related disasters⁸⁰. However, Eco-Schools coordinators believe that children should ask further why we should save water, and they should find out about the little amount of freshwater resources on the planet, especially as South Africa is a water-scarce country⁸¹.

Water contamination stemming from oil and pesticide pollution, and this type of pollutions’ impacts to animals, especially birds and how it threatens endangered species globally is addressed by teachers. Similarly, limited fossil fuel reserves, as well as the

⁷⁷ See some of the interview transcripts in Appendix 2

⁷⁸ Information Seminar about Eco-Schools, Winston Park Primary School, 24th Feb, 2012

⁷⁹ Information about activities obtained from Eco-Schools portfolios. The following are the schools those portfolios used as data for this research: Vukuzithathele Primary School, New Hanover Prep. School, Rainbow Eco-Home School, Faith-Way Christian School, St. Patrick’s Pre-Prep. School, Koppiesvlei Outdoor Education Centre, Kloof Pre-Primary School, King’s School.

⁸⁰ Portfolio research: Vukuzithathele Primary School, New Hanover Prep. School, Rainbow Eco-Home School, Faith-Way Christian School, St. Patrick’s Pre-Prep. School, Koppiesvlei Outdoor Education Centre, Kloof Pre-Primary School, King’s School.

⁸¹ Eco-Schools Workshop for Teachers; Agriculture, Environmental Affairs and Rural Development Department; Province of Kwazulu-Natal, Durban, 17th Feb, 2012

benefits and risks involved with other electricity sources such as nuclear, solar and hydropower energy, are also covered. While some teachers arrange a class discussion in order to explicate environmental impact assessment and the existence of different paradigms (see Appendix 3, Figure 18), some others allow learners to design sustainable house, energy or transportation systems, through which they can use books in the process of alternative technology, material selection, functioning principles and cost. As it can be seen in the Figure 14 and 15, Hilton Intermediate School learners experience this type of education.

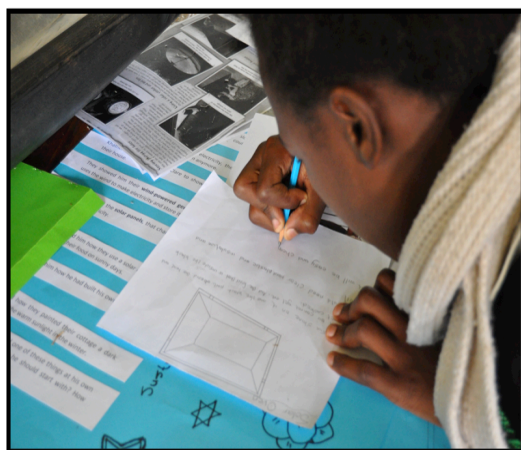


Figure 14: During project preparation of a solar oven



Figure 15: Students present their projects to their classmates

6. Discussion

In this chapter, the ways in which this research reveals current gaps and emphasizes the successful points of education for sustainability in the case study area, thus leading to a potential empowerment of teachers, educators and learners, will be discussed. The discussion will include the evaluation of the case, lessons learnt and personal input.

6.1. The Eco-Schools Programme as a Contributor to Quality of Education in South Africa and Theoretical Critiques

Apart from personally participating in the Eco-Schools process, it was very inspiring to attend the Eco-Schools workshop, meet Eco-Schools educators and observe the presentations, which aim to overcome current obstacles in the Programme's education approach. Government officials, provincial coordinators, node coordinators and other participants from all over South Africa were in Howick to learn from each other's success stories, to share their experiences, and to improve the quality and scale of the current implementations.

The commitment of numerous partners and pools of resources, which contributes to certain schools' access to educational resources, render the Eco-Schools programme very special. Furthermore, providing additional learning materials, entering competitions and networking with other schools allow Eco-Schools to reach numerous learners and support their basic education, along with supporting the development of

knowledge of sustainability through the incorporation of activities. The unique nature of the programme, which combines education and entertaining activities, allows individuals to stretch further and upskill themselves. Awards show that schools are following Eco-Schools implementations and suggestions; they do not drop off, but rather improve their sustainability education activities over time⁸².

In many cases, Eco-Schools South Africa also has strong and weak points. What makes it unique and successful centres on educators' individual intention and dedicated work, which changes the whole story, in spite of many of the obstacles introduced above. With the help of the extensive network and interaction possibilities that Eco-Schools provide, to hear and learn from one another's stories, continuously reflect on practices, gain influence from best practices and find a voice, are the most significant assets of the programme as also noted by educators.

6.1.1. How Can Eco-Schools Support the Education System Further?

The South African Eco-Schools Programme also needs slight changes in order to improve its practices, as has been discussed during various workshops and seminars. Even though the programme extended awareness, awareness alone might not be enough for taking action as it has been exemplified. In order to improve the quality of traditional education methods and influence participants' daily actions, Eco-Schools needs to increase and develop their active learning and experiential education approach in line with the new curriculum. Frequent activity control is essential, especially due to the implementation of the recently introduced CAPS curriculum. Other than that, bringing materials to read, letting children engage with the scientific vocabulary and then practicing that knowledge actively is considered as a crucial step that Eco-Schools should take in order to expand their current practices⁸³. Using stories and narratives as an introduction to sustainability issues, and then allowing learners to observe and experience with teachers, was also indicated as a successful method from teachers themselves. Last but not least, improved documentation and monitoring process of the results, focusing on inclusive networking, is very critical in terms of the institutionalization of the programme⁸⁴.

According to educators, working with schools with very distinct backgrounds, limited motivation of some principals and teachers and their lack of support are the biggest challenges. Although the Eco-Schools Programme aims to achieve a learner-driven stage, depending on school and learner demographics, this becomes implausible in most of the cases due to existing social and infrastructure problems. Thus, in the aftermath of associated fieldwork, certain primarily accepted theoretical points were re-considered. Initially adopted arguments of this study were grounded on John Dewey's pragmatist notion and experiential education approach, which advocates the necessity of active participation, experience and student-led systems (Smith, 2002). However, the application of these theories can be quite context specific and they need to be modified

⁸² Information Seminar about Eco-Schools, Winston Park Primary School, 24th Feb, 2012

⁸³ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

⁸⁴ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

in relation with the particular characteristics of the education system, location, geography, socio-economic context, language and priorities of communities. When Dewey asserted his pragmatist theories; he also stressed the significance of reconstruction of ideas (Neubert, 2009). In this regard, Dewey was aware of the influences of altering social and cultural contexts; hence re-interpretation was the most expected outcome of his theories (*ibid.*).

Randler et al. (2005) stated that, as a teaching technique, a combination of classroom learning and a relevant active session gave the best learning results in relation with their control groups and experiments. Associated fieldwork of this research drew the same conclusion. In this context, initially reading real-life stories and scientific concepts make children understand better rather than going to a river and testing the water in the first place, as has been exemplified by teachers and educators during the fieldwork. When learners only test the water without initial knowledge, they cannot contextualize the information obtained from experiential education. Classroom learning/reading followed by personal experiences gave the best learning results.

John Dewey's ideas regarding experience and action were valid, but in the South African context, it is impossible to generalize the applicability of Dewey's progressive education theories. As it was in some of the affluent, private schools I visited, it is possible to reach a learner-driven and experience based stage. However, most of the schools I visited within the frame of this research were under-resourced government schools – and these learners are highly dependant on teacher input, commitment and interest. Problems in the social and educational realms, which include a lack of resources, problems with teacher distribution, a lack of commitment, and high orphan rates and other social problems explained above, render Dewey's theories inapplicable within a certain context. Particularly, the previously introduced concept that considers teachers as solely facilitators while students learn by themselves in relation with experiences (Hyslop-Margison & Strobel, 2007; Smith, 2002) became inaccurate in this research's context.

Therefore, instead of considering teachers as facilitators, they should be acknowledged as the main information resources that need to teach, predominantly in terms of language, sustainability problems and concepts through stories and other methods. The OBE curriculum can be indicated as an example of Dewey's pragmatist theories in relation with active involvement, constructive process and a learner-centred approach⁸⁵. However, its major failure raised questions regarding this theoretical standpoint and indicated the necessity of modifications and modern interpretations in the particular South African context. Government aims to amend the problems inherited from Apartheid-era education and OBE through the recently introduced CAPS curriculum, which is based on inclusivity, is nevertheless still in accord with Dewey's ideas⁸⁶.

⁸⁵ See Chapter 3.1: The South African Educational Context for previously introduced information about OBE

⁸⁶ See Chapter 3.1: The South African Educational Context for previously introduced information about CAPS

Consequently, assessing outcomes of the Programme and evaluating the certain educational approach is highly dependent on a particular context which encompasses teachers' pedagogical understanding, feedback mechanisms, associated activities, curriculum and even local environment (Hyslop-Margison & Strobel, 2007).

6.2. To What Extent Does Eco-Schools Facilitate Engagement with Local Sustainability Problems?

The Eco-Schools Programme considers collaborative activities, which encourage learners to communicate with each other and to work within a group (Smith-Sebasto & Obenchain, 2009; Prince, 2004) for the purpose of mitigating local sustainability challenges as a fundamental component of their approach. However, there is a need for becoming more reflexive in order to respond to changing local and cultural contexts, and involve children in experiential education strategies.

Dewey considered cultural patterns as “[o]ne of the central forces directing human thinking” (Glassman, 2004, p. 332) which can be utilized as a tool in order to assist children in terms of becoming more familiar with science in a local context. Incorporating everyday activities and the surrounding environment into school practices and providing access to the “community’s decision-making process” (*ibid.*, p. 328) would ultimately increase involvement and feed ownership feelings.

Apart from cultural learning and complementary approaches such as gardening (Strife, 2010), teachers should implement what they have learnt from Eco-Schools coordinators in their own classes to a greater extent. Most of the teachers’ understanding of school action projects are very limited and requires cooperation with Eco-Schools as I observed and also discussed by educators. In order to create resilient and adaptive communities, empowered learners who can link knowledge with practices and willing teachers are required. Thus, monitoring teacher motivation is essential in order to improve the Eco-Schools’ praxis. Other than that, since WESSA is a non-profit organization, the Eco-Schools Programme’s continuity depends on external funders, which might be challenging occasionally due to communication problems and different requirements⁸⁷. Active participation of learners into community level problem solving to a higher extent is desired, however, this can be very problematic due to raising expenses and limited school budgets⁸⁸.

6.3. How to Better Incorporate Global Sustainability Issues into the Eco-Schools?

In order to engage learners at the primary school level with global sustainability challenges, the educational content should include multi-disciplinary and intergenerational approaches (Knapp, 2005). Hence, the CAPS curriculum and teachers’

⁸⁷ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

⁸⁸ WESSA, Eco-Schools Workshop, Umgeni Valley, Howick, 6th-8th Feb, 2012

associated classroom practices are expected to contain these ideas, which allow children to make broader links in relation with global problems.

Going beyond rote-learning and adopting holistic approaches are required. For example, instead of only teaching recycling, focusing on 3R concept⁸⁹ as some of the schools already started. Similarly, even though children re-use certain objects due to lack of resources and poverty, they are not aware of the consequences of this action and its connection with environment and sustainability.

Last but not least, as it can be seen from examples, art and environmental competitions, international conferences (such as COP17) and school trips have a positive impact on children's knowledge of global sustainability issues. Therefore, these activities should be supported on a higher extent with the help of Eco-Schools.

7. Conclusion

Education is considered as one of the most effective tools in terms of alleviating local and global sustainability challenges and creating more aware and resilient communities. However, the South African education system has failed in the past in relation with both environmental education and basic education. The main reason for this failure has been the traditional top-down education approach, which was not flexible for local conditions and not capable of complying with the country's exceptionally diverse language, race, ethnicity and socio-economic background. Although the current transition that South Africa is going through towards a curriculum that prioritizes social justice tenets (CAPS) is promising, it is still early to state that CAPS is the desired approach for South African educational system. In this sense, the South African Eco-Schools Programme aims to provide supplementary education, particularly regarding environment and sustainability through active and participatory techniques.

This research aimed to evaluate the contribution of experiential education and active learning techniques into learners' understanding and contextualization of local and global sustainability issues through Eco-Schools' involvement. Results from the fieldwork indicated that learners are more likely to get benefit from classroom education followed by associated praxis, which require active participation. This approach allows them to get familiar with scientific concepts and vocabulary and put this knowledge into practice afterwards. Eco-Schools provide various alternatives for aforementioned practice sessions with the cooperation of educators and teachers along with contributing to an increase in the quality of the South African basic education system.

Even if the Eco-Schools Programme is quite beneficial for learners' sustainability education, it can increase its quality and effectiveness through slight modifications within their approach. In this regard, supporting under-resourced schools through

⁸⁹ 3R concept is a holistic approach that incorporates reduce, re-use, recycle principles

reading materials for those mainly located in areas that are experiencing social problems might make a difference. Also, re-shaping activities in order to address basic education skills such as reading, writing and speaking would contribute to children's learning along with facilitating the work of teachers' and motivating them.

Achieved results within the scope of this study supports the utilization of the active learning and experiential education concepts in order to develop the understanding of sustainability in the particular case study area and ultimately within South African context. Furthermore, the study reveals the important contribution of aforementioned experiential techniques to the development of basic educational skills. Although, local conditions and educational approaches were different than anticipated, initially accepted definitions of experiential methods were slightly modified in relation with pragmatic stances. In this sense, teachers' primary role in education was emphasized in certain South African contexts, in contradiction with John Dewey's approach.

References

- Are, A. (2008). *Cultural Issues Related to Sustainable Development in Nigerian Experience*. In I. Pramling Samuelsson & Y. Kaga (Eds.), *UNESCO, The Contribution of Early Childhood Education to a Sustainable Society* (p. 107-110). Paris: UNESCO. Can be reached from:
<http://unesdoc.unesco.org/images/0015/001593/159355e.pdf>
- Blair, D. (2009). *The Child in the Garden: An Evaluative Review of the Benefits of School Gardening*. *The Journal of Environmental Education*, 40:2, p. 15-38.
- Botha (Nico), R. J. (2002). *Outcomes-based Education and Educational Reform in South Africa*. *International Journal of Leadership in Education*, 5:4, p. 361-371.
- Breunig, M. (2005). *Turning Experiential Education and Critical Pedagogy Theory into Praxis*. *Journal of Experiential Education*, 28:2, p. 106-122.
- Bryman, A. (2008). *Social Research Methods (3rd Ed.)*. Oxford University Press: New York.
- Calder, W. & Clugston, R. (2005). Editorial. *Education for a Sustainable Future*. *Journal of Geography in Higher Education*, 29:1, p. 7-12.
- Carroll Jacobs, D. (2009). *Pragmatism*. In A. J. Mills, G. Durepos & E. Wiebe (Eds.), *Encyclopedia of Case Study Research* (p. 724-726). Thousand Oaks, CA: SAGE. SAGE Reference Online. Web. 10 Jan. 2012.
- Conley Tyler, M. H., Bretherton, D., Halafoff, A. & Nietschke, Y. (2008). *Developing a Peace Education Curriculum for Vietnamese Primary Schools: A Case Study of Participatory Action Research in Cross-Cultural Design*. *Journal of Research in International Education*, 7:3, p. 346-368.
- Davis, J. (1998). *Young Children, Environmental Education, and the Future*. *Early Childhood Education Journal*, 26:2, p.117-123.
- Emirbayer, M. & Maynard, W. D. (2011). *Pragmatism and Ethnomethodology*. *Qualitative Sociology*, 34:1, p. 221-261.
- Gambold, L. L. (2009). *Field Notes*. In A. J. Mills, G. Durepos & E. Wiebe (Eds.), *Encyclopedia of Case Study Research* (p. 397-399). Thousand Oaks, CA: SAGE. SAGE Reference Online. Web. 9 Jan. 2012.
- Garrison, J. (1994). *Realism, Deweyan Pragmatism, and Educational Research*. *Educational Researcher*, 23:1, p. 5-14.

- Garrison, J. (1995). *Deweyan Pragmatism and the Epistemology of Contemporary Social Constructivism*. *American Educational Research Journal*, 32:4, p. 716-740.
- Glassman, M. (2001). *Dewey and Vygotsky: Society, Experience, and Inquiry in Educational Practice*. *Educational Researcher*, 30:4, p. 3-14.
- Glassman, M. (2004). *Running In Circles: Chasing Dewey*. *Educational Theory*, 54:3, p. 315-341.
- Gough, N. (2002). *Thinking/Acting Locally/Globally: Western Science and Environmental Education in a Global Knowledge Economy*. *International Journal of Science Education*, 24:11, p. 1217-1237.
- Howley, A., Howley, M., Camper, C. & Perko, H. (2011). *Place-Based Education at Island Community School*. *The Journal of Environmental Education*, 42:4, p. 216-236.
- Hyslop-Margison, E. J. & Strobel, J. (2007). *Constructivism and Education: Misunderstandings and Pedagogical Implications*. *The Teacher Educator*, 43:1, p. 72-86.
- Johnson, B. & Manoli, C. C. (2010). *The 2-MEV Scale in the United States: A Measure of Children's Environmental Attitudes Based on the Theory of Ecological Attitude*. *The Journal of Environmental Education*, 42:2, p. 84-97.
- Khagram, S., Nicholas, K. A., Macmynowski Bever, D., Warren, J., Richards, E. H., Oleson, K., Kitzes, J., Katz, R., Hwang, R., Goldman, R., Funk, J. & Brauman, K. A. (2010). *Thinking About Knowing: Conceptual Foundations for Interdisciplinary Environmental Research*. *Environmental Conservation*, 37:4, p. 388-397.
- Kivinen, O. & Ristelä, P. (2003). *From Constructivism to a Pragmatist Conception of Learning*. *Oxford Review of Education*, 29:3, p. 363-375.
- Klein, H. K. & Myers, M. D. (1999). *A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems*. *MIS Quarterly*, 23:1, p. 67-94.
- Knapp, C. E. (2005). *The "I - Thou" Relationship, Place-Based Education, and Aldo Leopold*. *Journal of Experiential Education*, 27:3, p. 277-285.
- Lotz-Sisitka, H. & O'Donoghue, R. (2008). *Participation, Situated Culture, and Practical Reason*. In A. Reid, B. B. Jensen, J. Nikel, & V. Simovska (Eds.), *Participation and Learning: Perspectives on Education and the Environment, Health and Sustainability* (p. 111-127). Springer Publications: Netherlands.
- Lyons Higgs, A. & McMillan, M. V. (2006). *Teaching Through Modeling: Four Schools' Experiences in Sustainability Education*. *The Journal of Environmental Education*, 38:1, p. 39-53.

- Malone, K. & Tranter, P. J. (2003). *School Grounds as Sites for Learning: Making the Most of Environmental Opportunities*. *Environmental Education Research*, 9:3, p. 283-303.
- Maloof, J. (2006). *Experience This; The Experiential Approach to Teaching Environmental Issues*. *Applied Environmental Education & Communication*, 5:3, p. 193-197.
- McNaughton, M. J. (2010). *Educational Drama in Education for Sustainable Development: Ecopedagogy in Action*. *Pedagogy, Culture & Society*, 18:3, p. 289-308.
- McTaggart, R. (1999). *Reflection on the Purposes of Research, Action, and Scholarship: A Case of Cross-Cultural Participatory Action Research*. *Systemic Practice and Action Research*, 12:5, p. 493-511.
- Mordock, K. & Krasny, M. E. (2001). *Participatory Action Research: A Theoretical and Practical Framework for EE*. *The Journal of Environmental Education*, 32:3, p. 15-20.
- Neubert, S. (2009). *Reconstructing Deweyan Pragmatism: A Review Essay*. *Educational Theory*, 59:3, p. 353-369.
- Olson, M. (2009). *Action-Based Data Collection*. In A. J. Mills, G. Durepos & E. Wiebe (Eds.), *Encyclopedia of Case Study Research* (p. 4-6). Thousand Oaks, CA: SAGE. SAGE Reference Online. Web. 9 Jan. 2012.
- Otieno, L. (2008). *Cultural Considerations in Early Childhood Education for Sustainable Development*. In I. Pramling Samuelsson & Y. Kaga (Eds.), *UNESCO, The Contribution of Early Childhood Education to a Sustainable Society* (p. 93-97). Paris: UNESCO. Can be reached from:
<http://unesdoc.unesco.org/images/0015/001593/159355e.pdf>
- Pramling Samuelsson, I. & Kaga, Y. (2008). Introduction. In I. Pramling Samuelsson & Y. Kaga (Eds.), *UNESCO, The Contribution of Early Childhood Education to a Sustainable Society* (p. 9-17). Paris: UNESCO. Can be reached from:
<http://unesdoc.unesco.org/images/0015/001593/159355e.pdf>
- Prince, M. (2004). *Does Active Learning Work? A Review of the Research*. *Journal of Engineering Education*, 93:3, p. 223-231.
- Ragin, C. C. & Amoroso, L. M. (2011). *Constructing Social Research (2nd Ed.)*. SAGE Publications: California.
- Randler, C., Ilg, A. & Kern, J. (2005). *Cognitive and Emotional Evaluation of an Amphibian Conservation Program for Elementary School Students*. *The Journal of Environmental Education*, 37:1, p. 43-52.

Reid, A. & Nikel, J. (2008). *Differentiating and Evaluating Conceptions and Examples of Participation in Environment-Related Learning*. In A. Reid, B. B. Jensen, J. Nikel, & V. Simovska (Eds.), *Participation and Learning: Perspectives on Education and the Environment, Health and Sustainability* (p. 32-60). Springer Publications: Netherlands.

Rosenberg, E. (2009). *Teacher Education Workbook for Environment and Sustainability Education*. Rhodes University Environmental Education and Sustainability Unit, Grahamstown. Distributed through Share-Net, Howick, South Africa. Can be reached from:

http://www.capeaction.org.za/uploads/ENVIRONMENT_TEACHER_WORKBOOK_BOOK_ALL.pdf

Sabo, H. M. (2010). *Why an Early Environmental Education?* Present Environment and Sustainable Development, Vol. 4, p. 263-268.

Scrivener, C. (2003). *Getting Your Voice Heard and Making a Difference: Using Local Environmental Issues in a Primary School as a Context for Action-Oriented Learning*. Support for Learning, 18:3, p. 100-106.

Silverman, D. (2000). *Doing Qualitative Research: A Practical Handbook*. SAGE Publications: London.

Smith, G. A. (2002). *Place-Based Education: Learning to Be Where We Are*. Phi Delta Kappan, 83:8, p. 584-594.

Smith-Sebasto, N. J. & Obenchain, V. L. (2009). *Students' Perceptions of the Residential Environmental Education Program at the New Jersey School of Conservation*. The Journal of Environmental Education, 40:2, p. 50-62.

Somekh, B. & Zeichner, K. (2009). *Action Research for Educational Reform: Remodelling Action Research Theories and Practices in Local Contexts*. Educational Action Research, 17:1, p. 5-21.

South Africa Department of Basic Education (2011). *Curriculum and Assessment Policy Statement Grades 4-6: Natural Sciences and Technology*. Pretoria: Government Printing Works. Can be reached from:

<http://www.education.gov.za/LinkClick.aspx?fileticket=WBXCxyCw03o%3D&tabid=692&mid=1933>

Strife, S. (2010). *Reflecting on Environmental Education: Where Is Our Place in the Green Movement?* The Journal of Environmental Education, 41:3, p. 179-191.

Sutinen, A. (2008). *Constructivism and Education: Education as an Interpretative Transformational Process*. Studies in Philosophy and Education, 27:1, p. 1-14.

Timmons, V. & Cairns, E. (2009). *Case Study Research in Education*. In A. J. Mills, G. Durepos & E. Wiebe (Eds.), *Encyclopedia of Case Study Research* (p. 100-104). Thousand Oaks, CA: SAGE. SAGE Reference Online. Web. 9 Jan. 2012.

Uygun, S. (2008). *The Impact of John Dewey on the Teacher Education System in Turkey*. *Asia-Pacific Journal of Teacher Education*, 36:4, p. 291-307.

Uzzell, D. (1999). *Education for Environmental Action in the Community: New Roles and Relationships*. *Cambridge Journal of Education*, 29:3, p. 397-413.

Uzzell, D. (2000). *The Psycho-Spatial Dimension of Global Environmental Problems*. *Journal of Environmental Psychology*, 20:4, p. 307-318.

Vambe, M. T. (2005). *Opening and Transforming South African Education*. *Open Learning*, 20:3, p. 285-293.

Wanyama, H. S. (2009). *Social Environmental Education Programmes and Their Application to Local Communities' Socio-Economic Development and Conservation Issues: South Africa and Tanzania*. Thesis, (PhD) University of Johannesburg. Can be reached from:

<http://drhswanyama.com/media/66e22dbe50a5030cfff823a7f000101.pdf>

WESSA & WWF (n.d.). *Eco-Schools South Africa: Handbook*. Can be reached from: [http://wessa.org.za/uploads/images/projects/ecoschools/Handbook%202012%20\(2\).pdf](http://wessa.org.za/uploads/images/projects/ecoschools/Handbook%202012%20(2).pdf)

Yin, R. K. (2003). *Case Study Research: Design and Methods (3rd Ed.)*. Sage Publications, Thousand Oaks, California.

Appendices

Appendix 1 :Interview Questions

To Teachers/Educators:

- Which teaching methods are being used in terms of increasing participation of students into various activities?
- Is there anything you think of needs to be improved in order to increase efficacy of environmental education within WESSA?
- Do you observe any behavioural change or attitude on children subjected to experiential education throughout the learning process?
- What are the positive outcomes of active environmental education, rather than classroom based traditional education-any observations or comments?

To Learners:

- Do you learn anything about environment from your friends?
- Who teaches you the most about environment?
- What kind of activities do you enjoy and learn most about environmental and other problems?
- Do you think about somewhere else in the world having similar problems?
- What do you think is a problem here- what do you think is the reason for that?
- Do you think where I come from; do we experience similar problems? Like trees being cut down, dirty streets, bad air quality, poor people, HIV etc.?
- Can you briefly tell me what do you enjoy most when you are in nature- do you play games with your friends etc?

Appendix 2: Available Interview Transcripts

1. Siyabonga Sibiya, Teacher of Grade 7- Henryville Primary School

E: So, do you see any difference between telling children about environment in the classrooms and when they actively participating to certain activities?

S: There is a big difference. In the classrooms, I am only telling them about polluted rivers. But, when I take them to river Msunduzi and showing them our only water resource and explain them, if this will be polluted we will have polluted water at our homes and schools really makes a big difference.

E: How do you use school ground for environmental education?

S: We have a school gardening project all children and teachers are quite interested in that.

E: Have you observed any attitude change after experiential education practices?

S: Yes, I think they are more aware and responsible after field trips.

E: Do you emphasize global environmental problems or sustainability challenges in your lectures?

S: Yes, we talk about global warming and we are trying to integrate global warming as much as we can into curriculum. For example, we recently had an exercise about climate change. An average temperature here is rising, so we asked to children what do they know or think about weather temperatures here. After we had a class discussion to get everyone's ideas and they understood the concept because they are also aware of increasing temperatures. Now they know the reason.

2. Zama, Teacher of Grade 6- Caluza Primary School

E: Zama, please tell me a bit of problems, challenges you faced when you are teaching of environment and sustainability.

Z: This subject has been disregarded for a long time. On previous years children ignored, but in time they understood. They have to understand.

E: What are the differences between learning in classrooms and experiential learning? Do you observe any influence on children?

Z: Yes, there is big difference on learning of the children who have the chance to actively do something. If you let them feel, let them see, let them touch, they understand better rather than telling them what they should do.

E: Do you talk about global environmental problems in your classes?

Z: Yes, I gave them scenarios to think and reflect.

E: Can you tell me those scenarios?

Z: Imagine a child stuck in a car. All the windows and doors are closed and the sun is doing its work. I asked to my students what would happen to that child. Students responded, some said child would sweat, child would cry and finally one of them said child would die. And then I explained, we are the ones who will sweat, cry and eventually die if we do not stop global warming. Then they understood the concept better.

E: That sounds very interesting; do you have more of these stories?

Z: Yes, I put a seed in a bottle full of water and closed the lid. Children observed that seed died after some time. Then I explained, moist is not enough for living we also need air. And they experimented same thing as well.

E: Wonderful. I heard you have gardening activities at school. How is that going? Do children show interest?

Z: Our garden is just fine and some children are quite eager. They do gardening at their homes and sometimes even bring the seeds to school for planting here.

E: Do you have any social problems about background of the students; I have seen HIV/AIDS posters in the school?

Z: We have quite a lot of orphans. Of course, Department of Education and Department of Health provide funds and help them. We are also working for those children, we promoted gardens for orphans and tried to help them to get back to community and become a part of it. We must keep trying for the young ones.

E: So you must be also teaching about global social problems?

Z: Yes, we try to cover illiteracy, poverty and health problems.

3. Nqobile Nyoni, Teacher of Grade 6- Sifisesihle Primary School

E: Do you see any difference between experiential education activities and when you teach in the classroom?

N: Yes, children tend to learn better outdoors; they become more relaxed and stimulated.

E: Do you teach them about local and global environmental problems?

N: We definitely teach them about local environmental problems-each year we have a project within Eco-Schools and we incorporate these activities into curriculum. This year we have healthy living and climate change, so we definitely learn about global warming.

E: What do you teach for example?

N: About global problems, we invite a resource person from WESSA and MMAEP. This resource person teaches children about global problems and we also use textbooks and internet whenever available.

E: Have you experienced any challenges during the process?

N: Yes, we do have challenges. The biggest challenge is the time factor. Timetable does not allow us to teach properly. In an hour what can I do with children practically? Where can I take them to see and experience? We need more time to do things better, sometimes we have workshops on weekends but it is very rare.

E: Which techniques do you use in terms of being active?

N: We have some case studies and stories as techniques. These are more about pollution, climate change, recycling, 3R concepts. We are a part of 3R project and our school has been funded about this. What we do is not just in the classroom. We want them to integrate what they have learnt into real life situation, their real life problems. We try to do it and children respond to outdoor activities better.


Appendix 3: Supplementary Photos From The Fieldwork



Figure 16: Extent from recycling station, The Birches Pre-Primary School



Figure 17: Permaculture garden, The Birches Pre-Primary School



Environmental Impact Assessment

Scenario: Paris Hilton has convinced her father, the billionaire owner of the Hilton chain of hotels to allow her to build an exclusive resort to act as a safe haven allowing celebrities to escape the media and still live in the luxurious comfort they are used to. Following her recent visit to South Africa she has decided to build the resort in this country and has selected the Koppiesvlei Valley as her preferred location.

Roles

1. Private consultants hired by Ms. Hilton to gain planning permission from the provincial government.
2. Private consultants hired by an environmental awareness group seeking to prevent the development taking place.

Factors

Both sides will need to consider the two phases of a development, the construction and operation as well as economic, environmental and social impacts on both the local area as well as the country as a whole.

Economic – Unemployment rate in local village of Masilonyana is 80%.
Tourism is 2nd biggest generator of GDP in South Africa.

Environmental – Local area is popular due to un-spoilt natural beauty.
The area is covered in rolling grass lands and farm land.

Social – Most employment in the area is in Agriculture, local farmers rely on the labour

You will be given ample time to conduct fieldwork in the area designated for the development to gather information and then further time to plan your argument. You will present in a team to a panel who will judge the winners based entirely on the quality of your argument.

Figure 18: Environmental impact assessment task