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Descriptive analysis of the education for sustainable development programme: Fundisa for Change perspective

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Abstract

For teachers to contribute to the development of the environmentally sustainable and wholesome society envisioned in South Africa's Constitution, it was the goal of this paper to evaluate the effectiveness of teacher development workshops designed to equip teachers with environmental and sustainability knowledge and skills in the curriculum. In gathering and analyzing data for the study, a qualitative technique and a case study design were used. Face to face interviews of six teachers was used as the only data collection method. Results revealed that, in addition to encouraging positive changes in teachers' knowledge and skill acquisition, the program, as previously mentioned, also provided teachers with strategies for teaching about sustainable development by incorporating socio-cultural and environmental factors into the learning process. The training for Fundisa for Change should be made available to more teachers from a variety of schools, according to the paper, so that knowledge about the instruction of environmental topics can be spread throughout the province of Mpumalanga rather than being concentrated in a few schools.

Keywords: *Fundisa for Change, education for sustainable development, programme, socio-cultural, CAPS, curriculum*

1. Introduction

Education for sustainable development (ESD) in the curriculum must incorporate an inter-disciplinary, integrated, and active approach to learning, according to the 1995 White Paper on Education and Training (Department of Education [DoE], 1995). All levels and programs of the education and training systems must incorporate ESD to produce environmentally aware and engaged citizens and guarantee that all South Africans live dignified lives through the sustainable use of resources (DoE, 1995). It is significant to remember from the aforementioned remark that ESD in South Africa is

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implemented in all areas of education as well as in the curriculum and assessment policy statement (CAPS).

The Department of Environmental Affairs (DEA), in addition to the Department of Basic Education (DBE), is a significant actor in the implementation of ESD in the nation. For instance, the White Paper on Environmental Management Policy, created by the Department of Environmental Affairs (DEA) in 1997, contained seven strategic goals. Goal 5 is environmental education and empowerment, and the strategy is to advance education and empowerment of the people of South Africa in order to raise awareness of and concern for environmental issues and to help them develop the knowledge, skills, values, and commitment necessary to achieve sustainable development (DEA, 2017). The following objectives based on education and training help achieve Goal 5:

- ESD must be incorporated into all programs, levels, disciplines, curricula, official and informal education, as well as the National Qualification Framework.
- ESD must be incorporated into all training and employment assistance programs.
- to improve environmental literacy using various mediums.
- to make sure ESD initiatives and programs create a thorough awareness of the interrelationships between economic, social, cultural, political, and environmental challenges in local, national, and international contexts.

This paper emphasizes the role that non-governmental organizations (NGOs) play in the implementation of ESD in schools. According to Heckman, Humphries, and Kautz (2014:6), "school shapes character." They emphasize the importance of traits like "conscientiousness, perseverance, sociability, and curiosity" as examples of character traits. According to the CAPS curriculum, students will "act in the interests of a society based on respect for democracy, equality, human dignity, life, and social justice" and "be imbued with the ideals" (DoE, 2009:8). Character education teaches students how to make wise choices and behave in a way that is important for their career development, according to Ubukçu (2012).

Research Question

What effect does the teacher development program have on teaching strategies, assessment methods, and knowledge of ESD?

2. Literature Review

The effects of globalization on sustainable development, the teaching of ESD in schools, the role of the Fundisa for Change program in integrating ESD in schools, the role of teachers in disseminating ESD, the significance of ESD programs for teachers, and obstacles to ESD implementation in schools will all be covered in this section.

2.1 Globalisation's Effect on Sustainable Development

Globalization "does not just happen; humans make it happen," claims Lofdahl (2002:6). As a result, there is a sizable body of pro-globalization literature that not only discusses the micro-level paths and processes of globalization but also displays the micro-level tactics necessary to endure and succeed within its framework. Considering this claim, environmental catastrophes brought on by planetary shifts are a global concern.

Since South Africa is likewise experiencing these changes, the economic effects of globalization pose a danger to sustainable development. Other theories, however, contend that encouraging globalization is necessary since it has good effects on our lives (Lofdahl, 2002). Lofdahl (2002) asserts that these theorists see globalization as a forward-thinking and revolutionary endeavor. Most of the literature cited in this paper describes environmental problems such pollution, solid waste disposal, land degradation, nutrient depletion, or soil erosion but says little about the underlying causes of degradation. In support of the aforementioned, Lofdahl (2002) emphasizes further that it is imperative to critically examine the ideas, notions, and practices that have contributed to the current state of international affairs in order for the world to determine the best course of action to reduce environmental degradation. He believed that combining studies on environmental degradation on a global and local scale into a "coherent whole" would produce a much better outcome. He further mentions that such studies could present evidence that would contradict or support some previously held views of the world.

2.2 Teaching ESD content in Schools

Yang (2015) asserts that Taiwan's elementary and junior high schools' adoption of curricula and instructional strategies had an impact on the results of ESD. Yang presents the following illustration: In elementary schools, social science, nature, and life technology textbooks frequently include and make reference to nature and environmental issues but fall short of imparting knowledge that goes beyond a basic understanding of natural aesthetics. Teachers are more interested in teaching students to appreciate poetry than they are in teaching students to analyze semantics and use rhetoric. The Chinese, according to Yang (2015), ignore nature itself and use it to grasp the beauty of literature. Social studies, nature, and life technology curricula in Taiwan contain a lot of geographic and natural environmental material, although this material is based on knowledge rather than a true understanding of environmental challenges and instead emphasizes the beauty of nature. Yang (2015) contends that, despite the fact that students in primary school do not face significant academic pressure, environmental awareness cannot be attained just by reading the written materials used in the classroom.

2.3 Role of Fundisa for Change Programme in Teaching ESD Topics

The Fundisa for Change Program, whose goal was to promote environmental learning in teacher education, oversaw the teacher training workshops. The major objective of this article was to assess the effectiveness of the workshops (Fundisa for Change, 2016). According to the program, "Fundisa for Change's primary goal is to improve the way environmental themes are taught in schools" (Fundisa for Change, 2016). Numerous elements of the ESD material in the curriculum (CAPS) are new to teachers because of the persistently increasing environmental crises and uncertainties (DBE, 2017). Consequently, this affects how the content is taught to learners in schools. Fundisa for Change is a collaborative partnership programme that involves many of South Africa's major environmental organisations, including the state, universities as teacher training institutions, parastatals, NGO’s and private companies, that aims to enhance transformative environmental learning through teacher education (Fundisa for Change, 2016). One of the major stakeholders of the programme are South Africa’s

teacher education institutions, whose objective is to improve teaching of environmental concepts and transformative environmental learning in schools. Other stakeholders include Eco-schools, the Wildlife and Environment Society of South Africa (WESSA), GreenMatter, Environment Learning and Teaching, Delta Environmental Centre, South African Universities, The Lewis Foundation, British High Commission, Murray & Roberts, German Cooperation, the Department of Environmental Affairs and the Department of Education, the Department of Water Affairs, Water Wise, South African National Parks and the South African National Biodiversity Institute (SANBI) (Fundisa for Change, 2019). Lack of engagement of partners and participants often translates into a lack of ownership of the programme and consequently a lack of commitment. Fundisa for Change programme helps teachers and teacher educators to think about these aspects (social transformation, active and critical learning, high knowledge and high skills, progression, human rights, inclusivity, environmental and social justice, valuing indigenous knowledge systems and credibility, quality and efficiency) of the curriculum, and to bring out expanded knowledge and understanding of these important aspects of the curriculum, as found in the subjects. To achieve its capacity-building objectives, Fundisa for Change developed numerous teacher education support materials which are provided for training in participatory manner engaging the different stakeholders in the process. The programme is also engaged in the design, implementation, and evaluation of highly regarded nationally relevant capacity-building programmes for teacher educators and teachers (Fundisa for Change, 2016). It is important to mention that the South African Council for Educators (SACE) endorses training courses from this programme (Fundisa for Change, 2019).

Teachers should participate in the sociocultural and structural aspects that support teaching and learning in the community, according to Fundisa for Change (2013). These elements are included in this study's RST theoretical framework as well. Socio-cultural aspects include things like learners' past knowledge and experiences, language, culture, their personal histories, and the societal context, according to Fundisa for Change (2013). Resources, the availability of textbooks and appropriate learning materials, class size, poverty levels, and the way the schedule is organized are examples of structural issues.

The program places a strong emphasis on comprehending the environmental and sustainability concepts covered in many academic subjects. Teachers can use educational programs to improve their abilities and create resources without encountering many issues (Pedretti & Nazir, 2014). Three crucial facets of teaching—Subject Content Knowledge, Teaching Practice, and Assessment Practice—are the focus of the Fundisa for Change program.

The Fundisa for Change program's fundamental tenet is to develop high-quality environmental teaching and learning in South African schools by emphasizing science, environment, society, and sustainability (Fundisa for Change, 2013). As a result, teachers will be better equipped to make informed decisions regarding their personal lives as well as their careers in teaching and environmental knowledge and abilities. This context served as the backdrop for the program's focus on comprehending the environmental and sustainability information included in a variety of South African CAPS courses, including life sciences, geography, economics, and agricultural sciences.

The program used a variety of modules to instruct its participants, including the following:

1) The three sections that made up the Teaching Biodiversity: Life Sciences Grade 10–12 module (Shava & Schudel, 2013) were based on subject-specific knowledge, teaching practice, and assessment practice. These units' main objectives are:
   - Unit 1-What is Biodiversity,
   - Unit 2- The Roles of Biodiversity, and
   - Unit 3- Causes of Biodiversity Loss and Emerging Human Responses to Biodiversity loss.

The front page of the module is shown in Figure 1 below

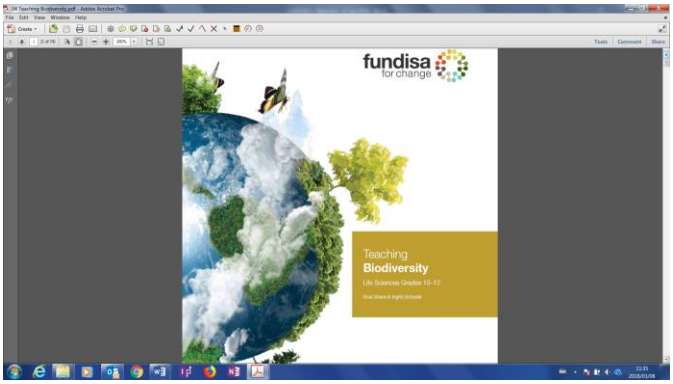

Figure 1: Teaching Biodiversity: Life Sciences Grade 10-12 module front page

2) Three sections that are based on subject content knowledge, teaching practice, and assessment practice make up the Teaching Climate Change: Geography Grade 10–12 module (Vogel, Misser & Vallabh, 2013). These units' primary objectives are;
   - Unit 1- Energy Exchange
   - Unit 2- Energy Resource Use and Change
   - Unit 3- Responses to Energy Exchange and Climate Change

The front page of the module is shown in Figure 2 below

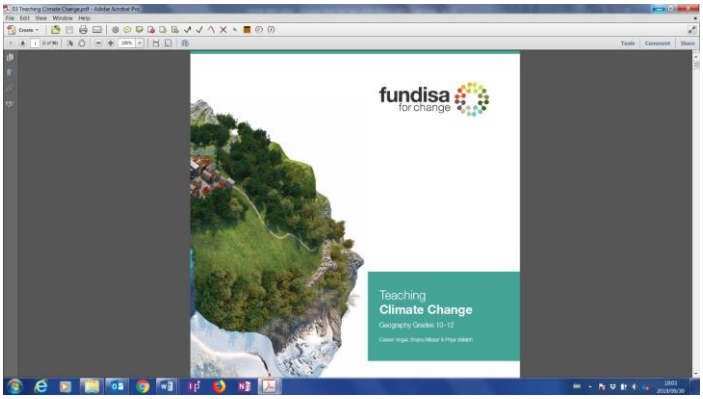

Figure 2: Teaching Climate Change: Geography Grade 10-12 module front page

2.4 Role of Teachers in the Dissemination of ESD Content

The evaluation of teachers' use of ESD, teaching methods, assessment, and teaching resources is one of the study's main focuses. According to Iqbal and Arif (2011:100), the government should choose teachers in accordance with professional competency and professional responsibility to ensure a high level of education. It should be remembered that not all teachers who possess professional competency also possess professional responsibility in this situation. Teachers have five key areas of responsibility, according to the Sonoma State University Academic Senate (2003, referenced in Iqbal and Arif, 2011:100):

- to their subject;
- to their students;
- to the institution of which they are a part;
- to their profession; and
- to the community at large.

The South African DBE establishes norms and standards of education that educators in all fields are required to incorporate into the learning program in support of the five primary areas of duty for educators. The DBE (2014) lists the following roles:

- In this capacity, the educator mediates learning while being sensitive to the various requirements of learners. The teacher should show a thorough understanding of the subject matter and numerous principles.
- Interpreter and designer of educational programs and materials: In this position, the teacher is responsible for explaining environmental concepts to students and creating educational programs that are tailored to their requirements.
- Learning subject expert: The teacher is expected to possess a solid foundation in the subject-specific knowledge, abilities, values, principles, methods, and processes. The teacher should be aware of the many methods for disseminating EE in ways that are suitable for the students and the setting.

To make sure that teachers are well-equipped to integrate knowledge and experience in the teaching of ESD in schools, the roles listed above are crucial. "The greatest challenge in teaching is how to develop, maintain, and inspire competent teachers throughout their careers; policymakers must continue to place a strong focus on hiring and preparing high caliber teachers" (Iqbal & Arif, 2011:101). The changes brought about by globalization in education, according to Iqbal and Arif (2011:101), "have been manifested through numerous channels and mechanisms as reforms of structures, modes of finance, administration, and curriculum."

"Teachers who are more aware, have favorable attitudes toward the environment, and demonstrate care for environmental problems are more likely to generate pupils who are more environmentally literate." (Gwekwerere, 2014:199; Tuncer, et al., 2009) "Teachers are unlikely to be able to effectively lead environmental change in schools if they lack competency in their environmental knowledge, skills, and dedication" (Gwekwerere, 2014:199). According to research, one of the barriers to the effective application of ESD in schools is the teacher education programs' poor integration of ESD

(Cutter & Smith, 2001; McKeown & Hopkins, 2002; UNESCO, 1997; Yavetz et al., 2014, cited in Gwekwerere, 2014:199). According to Gwekwerere (2014), numerous researchers have demonstrated in their studies that aspiring teachers lack the necessary knowledge and comprehension and have false beliefs about difficult curriculum topics like ESD.

2.5 Importance of ESD Programmes To Teachers

Iqbal and Arif (2011) argue that the interpretative, normative, and critical perspectives on education should be taught as the foundation and objectives of teacher training programs in the pre-service program. They emphasize that learning may be organized around facets of the relationship between the school and the wider community, problems with educational policy, or topics in fields like history, philosophy, and sociology of education. When they help students develop their ability to interpret and interpret the content and context of educational philosophy and practice, field activities created and overseen in conjunction with educational practitioners are appropriate parts of foundational studies (Iqbal & Arif, 2011:102). This modification "recognises the relevance of such areas of study as educational psychology, curriculum and instruction, educational administration, and pedagogical methodologies within professional teacher preparation programs," according to Iqbal and Arif (2011:102). However, while teacher presence is crucial, training in these subjects cannot be a replacement for humanistic and social foundational studies (Iqbal & Arif, 2011).

In recent years, there has been a growing understanding of the multifaceted impact that environmental concerns have on education. Similar circumstances have occurred in Africa, where, in contrast to the rest of the continent, Southern Africa accounts for over 75% of ESD research investigations, according to Irwin and Lotz-Sisitka (2005). One of the goals of the Fundisa for Change initiative, which encourages teachers to network in order to improve their knowledge of environmental impact themes across the curriculum, is to achieve this.

Markaki (2014:87) adds more commentary on the innovations that some programs ought to undertake with the single intention of fusing the most recent ESD trends with tried-and-true inquiry-based learning strategies and cutting-edge technology employed for educational reasons. The following should be incorporated into programs in order to meet these goals:

- By effectively educating the next generation to respond to pressing challenges like sustainable development and climate change and to make wise decisions for their future jobs, we may successfully and permanently integrate ESD to career settings.
- Make a list of the best educational scenarios that link the curricula of different nations to careers connected to sustainable development, making students more engaged and responsible on a personal and professional level.
- Create a network of educators who are educated to effectively use digital resources in science instruction and who are taught on the need of "green living and teaching."
- Promote efficient EE teaching techniques by connecting with relevant projects, networks, and initiatives in a global network, to guarantee continually expanding availability and re-usability of lesson plans connected to "green jobs" with the use of inquiry-based EE education.

Brooks (2012:86) confirms that "social and environmental repercussions that our consumption decisions have in other regions of the world can be exceedingly difficult to identify, imagine, and control" in support of the aforementioned. Furthermore, according to Howard (2012), when our attitudes toward the environment shift, so do our decisions on what to consume, how to travel, and what to value in culture. As a result, we need to develop new ways of thinking that are sustainable. The principles of sustainability may be included into teacher education, and this can only be done with a clear understanding of these values and the best ways for people to learn these values, according to Howard and Lake (2012). The knowledge gained from this study will help teachers learn about the environment and cascade that knowledge throughout the educational spectrum. Howard's view of their place in society is exemplified by initiatives like Fundisa for Change in South Africa.

2.6 Challenges Facing Implementation of ESD in the education sector

"One of the most crucial ESD subjects is subject matter, because the Earth has faced numerous environmental issues over the past thirty decades" (Taskin, 2003:4). Population increase, poverty, inequality, desertification, drought, climate change, solid waste, and hazardous materials are the issues, according to Taskin (2003). To back up Taskin's claim, Lofdahl (2002) makes the claim that when building a study on global environmental deterioration, it is simple to become overwhelmed by the minutiae since there are so many different components that it is impossible to fully characterize the system or its behavior. Scale and spatial dispersion are two main analytic elements that hide this difficulty. Scale takes into account both the economic process of growing globalization and the deterioration of the environment. Despite the fact that environmental deterioration has existed in some form throughout history, the recent expansion of economic activity, particularly in the second half of the 20th century, is of great concern (Lofdahl, 2002Di Chiro (2014) continues, "Environmental problems are therefore social problems caused by societal practices and structures and only viewed or socially constructed as problems because of their effects on human individuals and groups." Other living things and systems are also affected, he adds, "so environmental problems are social problems." Di Chiro (2014) claims that because ESD is so strongly focused on problem solving, this has extensive implications for environmental educators. Before developing and implementing successful ESD curricula, as well as before meaningful remedies can be produced, an environmental problem must be sufficiently characterized and comprehended (Di Chiro, 2014:10).

Research in education generally, as well as in EE/ESD, has sadly been hampered by a failure on the part of the research community to recognize the need for a more complete range of research perspectives than those typically found, as well as by a failure to recognize the occasionally inevitable misuse of technique that can happen when appropriate methodologies do not seem to be available (Jickling, 2014). According to Di Chiro (2014:12), "proper understanding of environmental challenges demands viewing as the outcomes of contested discourses, activities, and interactions among human societies through constructive discussions." Simply attributing them to difficulties with excessive industrialization or inadequate resource management, which can be resolved with carefully thought-out technical solutions, misses the root roots of the crises. Additionally, by primarily emphasizing nature or the ecological balance as the major "victims" of the

issues, they are effectively distanced from the messy world of society and depoliticized (Di Chiro, 2014:10).

According to Stanisic and Marksic's (2014:124) research of Serbia, there are certain difficulties with how ESD is delivered in the classroom, including the idea that teachers are expected to teach new material in a different way without the proper education or training. Students are required to apply their knowledge and take initiative in regard to ecological issues in local and global settings, according to Stanisic and Marksic (2014:124). However, they often struggle to apply the relevant environmental concepts in their own natural surroundings. Additionally, they learned that the curriculum's required ecological subjects were many and frequently overlapped. Because of this overlap, students might not be able to learn everything they need to know about ESD.

Palmer (1998) further points out that the inclusion of ESD in a curriculum poses a fundamental challenge to the prevalent idea, organization, and transmission of knowledge, leading to a conflict for most teachers with their teaching and learning philosophy. Palmer elaborates on the contrast between the ESD's action-oriented objectives and the environmental knowledge and awareness that students are learning in schools. Palmer (1998:96) cites Stevenson (1987) who lists a number of significant inconsistencies between ESD and education. In the first case, Stevenson paints a picture of a scenario in which the language of ESD aims to raise the standard of living for everyone by finding means to ensure that no country develops or grows at the expense of another, and that no consumer demand rises at the expense of other countries. Stevenson asserts that this is the first significant incompatibility between ESD and the conventional function of schools, which is to preserve the natural resource order by propagating the norms and values that now guide environmental decision-making.

3. Methodology

The discussion of the research approach and design, the technique of sampling and data collecting, and the analysis and interpretation of the data made up the research methodology for this paper.

3.1 Research approach and design

According to McMillan and Schumacher (2010), a research approach outlines how we perform a study, including how, when, and from whom we will collect data. Johnson and Christensen (2008), on the other hand, hold that qualitative research can be used to characterize what is observed and to develop or produce new theories. They also demonstrate that when little is known about a subject or phenomena and one wishes to learn more or do further investigation, qualitative research is used. According to McMillan and Schumacher (2010), this work employs a qualitative research methodology that places a strong emphasis on acquiring information about naturally occurring events.

Using a case study design, interviews with the teachers were conducted. According to McMillan and Schumacher (2010), a case study involves the collection of numerous sources of data from the research environment and conducts an in-depth analysis of a constrained system through time. According to Creswell (2009), a case study is a method

or line of inquiry in which the researcher thoroughly investigates a project, an occasion, an activity, or a process involving one or more people. Similar to complex organizations, cases also contain elements and behave or operate in their environment. According to Creswell (2009), McMillan and Schumacher (2010), a case can be chosen for investigation due to its exclusivity.

3.2 Sampling and data collection

Using the convenience sampling method, the sample was chosen. Data were gathered from population members who could easily engage in the study using this strategy, which was chosen. The number of teachers that attended the training session offered by Fundisa for Change determined the actual sample size. From six Mpumalanga schools, six teachers were chosen. As an example, these participants were easily sampled based on their availability to engage in the research because of the training sessions they underwent on Teaching Climate Change: Geography Grades 10-12 and Teaching Biodiversity: Life Sciences Grades 10-12.

Teachers were interviewed for this study in face-to-face, semi-structured interviews. After school, participants were invited to participate in the interviews. In semi-structured interviews, the interaction between the researcher and the participant is not precisely scripted, according to Yin (2011), but the researcher does employ a list of questions as an interview guide. This keeps the interview on topic while also allowing for more in-depth inquiries that the researcher can utilize to get more information from the participant.

3.3 Data analysis and interpretation

Creswell (2009) asserts that participatory procedures with interconnected stages define qualitative data analysis. The steps involved in these stages, which were taken from Creswell's (2009) data analysis framework, are as follows:

Step 1: Sort through and get the data ready for analysis.

Step 2: Reading through all the data is step two. The second step, according to Creswell (2009), is to take stock of the data and consider its larger implications.

Step 3: A thorough analysis of the coding procedure is carried out at this point. The segments of data in this study are organized.

Step 4: Apply the coding method to create a description of the scene, participants, and categories.

Step 5: You must write a qualitative narrative throughout this phase.

Stage 6: According to Creswell (2009), interpreting or giving meaning to the data is the last step in data analysis.

4. Results

Teachers who participated in the Fundisa for Change program were interviewed in this study about a variety of topics, including their perceptions of the program's significance and role, its effects on teaching and learning, and potential future

improvements. Following categories emerged from this paper's analysis of the three questions that were asked of teachers during interviews:

1) Teachers' perceptions on the contribution and role of the programme
2) Effects of the programme on teaching and learning
3) Improvements that can be adopted by the programme in future

4.1 Teachers' perceptions on the contribution and role of the programme

Teachers were asked about the training provided by Fundisa for Change in terms of improvement in delivering lessons in the classroom, the question was, "*How did the training provided by Fundisa for Change programme assist you in delivering your lessons on environmental impact topics?"*, one teacher replied,

"It helped a lot; we realised that the different forms of teaching methods can be implemented, but some of them as I have indicated in methods I use, even if you lack resources." (Teacher 1).

According to the claim, teachers benefited from the program and could now teach ESD classes using the content expertise they learned from the Fundisa for Change initiative. One teacher claimed that after taking part in the program, he was better able to deliver environmental impact-related lessons after learning about different teaching strategies. The teachers' newfound knowledge of teaching techniques was categorized into deliberative, experiential, investigative, learning by doing, and information and transfer approaches. The students in his geography class did well on their final exams as a result. Regarding the training, another participant made the following comment:

"It was very informative, I used to be like my learner where I was also blaming others and I learnt that they are many things that I do, which I was not aware I am contributing to climate change. You become conscious of what is going on around you don't just litter and I don't misuse the resources. How CAPS is interrelated. Other concepts for climate change that I learnt which we normally say these you will learn in science, and we did not know about them. It gave us confidence." (Teacher 5)

Teachers also mentioned how the program helped them with real-world classroom teaching strategies that made their classes more engaging for students and improved their comprehension of environmental impact issues. The program empowered educators to cover environmental subjects in the classroom. This is supported by the realist social theory, about which educational training programs alter current school structures by redefining roles, supplying new resources, adopting new practices through in-service training, and aligning evaluation to better serve new student generations (De Souza, 2013). Another participant when asked: "*How has the training provided by Fundisa for Change programme assisted you in delivering your lessons on environmental impact topics?*" replied that:

> *"Definitely how can I dispute that one, it really assisted our school and results improvement, and my subject was part of that. The learner got 100% and the learner was recognised in the province"* (Teacher 2).

I disagree with the teacher's claim that he obtained a 100% pass rate for Geography because of participating in the program. However, it is possible that the

program's effort also played a role in the results' improvement, which does not mean that the program's initiative alone is to blame. In my opinion, there may have been other elements involved in students' successful completion of the year's work. Improvements in planning, student discipline, and school culture, among other factors, could all contribute to better exam results for students. It is undeniable that attending the Fundisa for Change program enhanced results, but it is probably not the only one.

Teachers' opinions and appreciation of the program also showed that, before to attending, they lacked sufficient expertise on how to teach their students about environmental impact themes in a way that would ensure that students comprehended the work. The delivery of ESD in the classroom, according to Stanisic and Marksic (2014:124), "has some obstacles, including teachers who are expected to present new content in a different way without any suitable education or training." Similar to South Africa, where diagnostic reports in subjects including Agricultural Sciences, Life Sciences, and Geography found that students were still having difficulty understanding the phrases used to describe environmental impact during tests (DBE, 2017). Iqbal and Arif (2011:100) argue that for programs like the Fundisa for Change initiative to be successful, "all teachers must have a global perspective, be well-prepared, and be given proper support and ongoing professional development." This is supported by UNESCO's (2005) approaches to EE and ESD, which claim that teachers need to develop the essential skills and develop a sense of moral purpose in order to leverage local knowledge and contextual relevance while teaching environmental impact topics.

This study considers teachers' perspectives on how curricular changes have impacted the way environmental impact issues are taught and how initiatives like Fundisa for Change have helped them become better teachers. "Teacher studies on educational reform have employed the quantitative method," says Ramberg (2014). As a result, discussions on what curriculum changes are necessary and how to execute them have rarely incorporated the perspectives of teachers. In order to further the notion of teachers acting as change agents, a different study focus should be encouraged.

4.2 Effects of the programme on teaching and learning

When one teacher was asked, "*How has the training provided by Fundisa for Change programme assisted you in delivering your lessons on environmental impact topics?"* he responded,

> *"Yes, I got the idea, regarding the excursions from this training, because they took us to the Nelspruit botanical garden. They took us there. We are adults and we are teachers, but we enjoyed it like we were learners. That is where I got my teaching ideas, I started implementing the following year till today. And you can't teach about the environment in the classroom, some things you just can't teach while in class, they need practical experience"* (Teacher 6).

This participant's reaction demonstrated the program's beneficial impact on both teaching and learning inside the educational system. It follows that the program not only supplied teachers with content knowledge and skills, but also with strategies for teaching about environmental effect, such as incorporating sociocultural characteristics of students into the teaching process. One of the program's ideas that teachers discussed was going on trips. Some of them are now incorporating that notion into their regular

teaching activities. The realist social theory, which holds that cultural elements include concepts about roles, positions, practices, resources, and procedures inside a structure, also serves as an example of how the program's ideas are adopted. The action's structural, material, and physical components as well as its conceptual components change because of changes (Archer, 1995 & De Souza, 2013). According to certain participants in research by Irwin (2010), EE teachers were impoverished by the limited application of EE to outdoor education, which allowed for the teaching of more robust and critically focused subject in classrooms. Regarding the aforementioned, UNESCO (2005) emphasized that teachers should employ multi-dimensional teaching strategies while teaching environmental impact-related issues.

When participants were asked, *"Did your teaching of the content improve after the training?"* one teacher responded that:

> *"The change is when I prepare my lesson, because at the training, we had time to be outside and it actually made me realise that, there are things we can use from the school and make the lesson interesting and practical within the school yard and not concentrate only on the textbook"* (Teacher 4).

The positive contribution of the programme was therefore evident in their lesson preparation. In response to the same question, one teacher mentioned that:

> *"Yes, it did. In terms of lesson planning the objective is practical, like pollution you don't have to refer them to the industries, because we also contribute"* (Teacher 1).

In the example above, the teacher admitted that he had previously been teaching about environmental impact themes like pollution by focusing solely on industries as the main polluters, omitting the fact that everyone of us as individuals also contributes to pollution. I concur with the teachers that improving your ability to instruct in various settings can benefit your students. Learning how to include various teaching methods into the study of environmental impact issues increased teachers' self-assurance, and students benefited by performing better on exams, allowing them to develop into responsible citizens whose actions support environmental sustainability. This demonstrated how the curriculum enhanced teachers' content knowledge, instructional practices, and assessment techniques. This is in line with UNESCO's (2005) recommendation for a teaching strategy that emphasizes application and incorporates learning into the regular personal and professional setting.

Teachers reported that the program increased their strategic questioning, classroom presentations, and report writing thanks to resources like copies of the modules they were trained on, in addition to their content understanding. Different assessment techniques and tools, as well as a variety of potential teaching strategies, are available in these modules for Biodiversity and Climate Change, which aided students throughout classes on environmental impact themes.

4.3 Improvements that can be adopted by the programme in future

Although participants noted that the training helped them in their teaching, they also offered suggestions for ways that Fundisa for Change's future programs may be improved. This section analyzes and evaluates some of the suggestions made by teachers regarding what they believe should be done in the future to enhance the training that

would be beneficial to their teaching and learning in the classroom. First, one teacher said:

> *"We felt that the time set and scheduled for the workshops was not enough because we were excited, and we were anticipating more information sharing"* (Teacher 2).

It is significant to note that all of the teachers agreed that the duration of such programs should be extended, and they continued to look forward to receiving a lot of information about how they may modify their teaching strategies. They felt that more than one week should be allocated for such insightful instruction. On a different note, one participant when asked, "*What needs to be done in future to improve the training provided by Fundisa for Change?*" suggested:

> *"I think they need to come with a method of teaching large classes, because that is our challenge and how to discipline learners without losing contact time with them"* (Teacher 1).

This response showed that teachers still struggle to teach in packed classrooms, especially in township schools, and that in these situations, they require the right techniques to teach about environmental effect. Unlike most instructors, one said that the Fundisa for Change program enabled her to impart environmental concepts to large groups of students outside of the classroom. This demonstrated that teachers continue to have issues with crowded classrooms and prefer to do classroom presentations outside. This is the teacher said:

> *"It helped me, that I was able to take a large group of learners to the ground. I can now manage a group of learners"* (Teacher 4).

Teachers thought that the program may play a significant part in supplying ways for teaching in large, crowded classes. Teachers anticipated additional examples of activities that would be suitable for teaching large classes in this scenario.

One teacher put forward that:

> *"I think it was informative and more educators need to be invited, because we were expected to transfer the information, but it would not be sufficient because we might forget other things"* (Teacher 5).

All the participants in this study noted that while the training workshop was educational, it was anticipated that the taught teachers would spread the knowledge to other teachers who weren't there. Teachers, however, found it difficult to explain the material to other educators exactly as it had been taught in the program. Teachers recommended that the Fundisa for Change initiative include more educators so that they could take advantage of the resources, expertise, and abilities that could be incorporated into their curriculum-based teaching activities. When asked what has to be done in the future to enhance the training provided by Fundisa for Change, one of the teachers replied:

> *"I think they need to add more teachers we were few. More outdoor activities (We spent a lot of time indoors listening to presentations, we only went out once, life science its practical subject"* (Teacher 6).

We can draw the conclusion that during this study, teachers valued the Fundisa for Change program's effort. They did, however, advise that in the future, if such programs were held in the province of Mpumalanga, more teachers needed to be invited, the program organizers should also provide activities that can be used in large classes since the government has not addressed the issue of overcrowding, and more time needed to be allocated for such programs. Although they valued the time allotted for outdoor activities, it was not enough for them to become familiar with other exciting activities offered by the training program.

According to the teachers who participated in this survey, training programs like the one offered by Fundisa for Change should be centralized in the province so that more teachers will be able to attend without having to travel far. They added that the Department of Education does not provide funding for the training, which deters many teachers from participating. They believed that the likelihood that teachers would attend the training if they were invited again increased with the proximity of the site to the majority of teachers. Regarding the training location, one teacher gave the following response:

> *"I think it must be done again and the invitation should be open to more teachers. The venue should be close because teachers tend to run away because the department doesn't fund them"* (Teacher 3).

5. Discussion

Examining the effect of the Fundisa for Change program on the way ESD themes were taught during the CAPS FET phase was one of the goals of this essay. The Fundisa for Change Environmental Teacher Training Program was attended by all the teachers that were interviewed. Fundisa for Change, as previously indicated, is a partnership amongst a variety of teacher education partners working with teachers around South Africa to enhance and deepen environmental teaching in schools (Fundisa for Change, 2014). The findings of this article showed that teachers who took part in the program benefited and that they became better at teaching ESD material. Participants remarked that the curriculum offered a variety of possibilities for using in the classroom when presenting ESD material. Most teachers undoubtedly believed that teaching techniques like field trips and practical work helped them to better prepare for and deliver lessons on environment-impact issues in disciplines like geography and life sciences with little difficulty. Teachers, who are considered change agents, also mentioned that exposure to the Fundisa for Change program aided them in creating useful teaching methods for fieldwork-based instruction of environmental subject matter outside the confines of the school. In agreement with this, Oguz (2004) stated that research on teachers' perspectives of ESD has revealed that teachers have a desire to incorporate environmental principles into their teaching. I concur with the participants that all teachers should have access to such programs in light of these outcomes. This would help to lower the high failure rate on summative assessment issues related to ESD. If teachers are not exposed to initiatives like Fundisa for Change, I contend, the high failure rate on ESD in summative assessments will only increase.

In addition to learning new teaching techniques from the program, teachers acknowledged that they also gained knowledge and abilities that they can apply to their assessment procedures. Teachers felt that the curriculum helped them learn new subject matter about current problems involving the effects of human activity on biodiversity and climate change. They felt they could now employ several methods of effective assessment, including report writing, strategic questioning, classroom presentations, and observation while on excursions. Most importantly, all of the participating teachers came to the same conclusion that the program had given them the opportunity to share fresh perspectives on how to teach subjects related to environmental impact, and that they were now putting the various suggestions that had come up in the course to use. One teacher cited the idea of using learner's shoes that could be sorted according to size, color, make, and other factors as an example for teaching biodiversity. When teaching and learning resources are scarce, this might be utilized in the classroom to educate species diversity. It also assisted teachers in recognizing differences. Teaching techniques and information about environmental impact subjects were acquired by the instructors both inside and outside of the classroom. Critical thinking abilities and knowledge were gained, and they not only helped with instruction but also enhanced student and teacher comprehension of the material, which can support environmental sustainability. This backs up UNESCO's (2005) assertion that ESD teaching should be interdisciplinary and holistic.

Besides how the programme assisted teachers in delivering lessons in and outside the classrooms, teachers were asked if their teaching of the teaching strategy improved after the training. Most participants indicated that they implemented positive changes in their lesson presentation after attending the programme. The results of this paper revealed that ESD lessons became more interesting to learners because of alternative learning strategies that were now being used by the teachers after the training. In contrast to being confined to the classroom, which was the usual before to participating in the program, teachers said that they now used the schoolyard more frequently while teaching ESD issues, and students expressed interest in and full participation in outdoor activities. The program's principles being implemented in the classroom supports Archer's (1995) RST relations dimension, which is present in structure, culture, and agency. The effectiveness of a school program may depend on how teachers feel about carrying out their tasks in accordance with the curriculum, which serves as a guide for their instruction, as can be shown in this paper. The idea also supports the findings of this work, which suggest that students' confidence in their ability to learn, study, and complete assignments may be a factor in their performance. As a result, teacher saw that their subject-matter expertise had increased and that they had been able to bring new teaching resources to their schools, which they are still using today. In contrast to other participants, one said that through engaging in outdoor activities, she was now able to handle larger groups of students. Since the government was unable to offer sufficient classroom space to reduce overcrowding, most instructors responded that they would require additional workshops on how to manage big groups of students when teaching environmental impact themes. I concur with most teachers that teaching large classrooms creates a barrier to learning since teachers are unable to concentrate and support certain students who are struggling with the lesson.

I was intrigued to see that several participants said they started environmental groups in their schools after completing the workshop. Environmental committees were established in a few schools in Secunda, Mpumalanga province, with the goal of ensuring that environmental days were observed there and that students kept the premises free of litter.

Gwekwerere (2014:201), who claims that in order for students to get a lasting understanding of the environment, teachers should make sure they provide them with opportunities to:

- Develop a sense of ownership over the environmental knowledge they pick up from the curriculum;
- participate in real experiences that are an essential component of ESD courses;
- work on projects that address environmental concerns in their communities; and
- work on action initiatives.

Teachers said the Fundisa for Change program might help the education sector more. First, teachers complained that the training was rushed and that they didn't have enough time to exchange teaching strategies. Second, the study's findings showed that teachers continued to require assistance with large-class teaching tactics. As was already mentioned, teaching in crowded classrooms hinders efficient teaching and learning. Thirdly, teachers felt that the program's location ought to be more centrally located in the future to draw in more of them as participants. Due to time limits, they found it challenging to cascade the new material to other teachers, so they recommend that all teachers attend the session. Finally, teachers acknowledged the significance of the program and suggested holding recurrent Fundisa for Change workshops to improve their subject-matter expertise and instructional techniques, not just for ESD themes but also for all other topics for other disciplines. Iqbal and Arif (2011:106) stress the need to "urgently recognize teachers' work as complicated and demanding, and improvement in teacher quality necessitates a re-conceptualization of how we prepare a new generation of teachers".

6. Conclusions

Teachers reported that the curriculum assisted them in developing and implementing new ideas and teaching strategies for environmental content. The program helped teachers, and they were able to conduct lessons on environmental impact subjects using the content knowledge, pedagogical strategies, and assessment techniques they had learned from the Fundisa for Change program. As a result of attending the workshops, teachers stated that their students' performance on summative exams had improved. The varied teaching strategies they were exposed to in the program, which were applicable to themes related to environmental impact as well as other subject areas, they claimed, was the basis for this progress. They also said that they were able to add practical teaching techniques into their classes, which made the lessons more enjoyable for the students and improved their comprehension of the concepts related to environmental impact.

Teachers admitted that prior to participating in the Fundisa for Change professional development program, they lacked the skills necessary to educate their students about environmental impact themes in a way that would ensure that they comprehended the material. Iqbal and Arif (2011) note that for instructors to improve their instruction, they must be prepared and given the proper assistance and professional development. This type of support was demonstrated in this study through the efforts of the Fundisa for Change program. Along with helping teachers become more proficient, the program provided them with materials that were very helpful in providing students with environmental curriculum understanding and excellent teaching and evaluation methods. Additionally, teachers noted that they gained fresh insights into how to enhance their teachings on ESD themes in the courses they were instructing.

As was already indicated, the program not only promoted improvements in teachers' knowledge and skill acquisition, but it also offered strategies for teaching ESD content using methods that consider sociocultural and environmental factors. Teachers used the example of air pollution to illustrate how, while though industries are primarily responsible for environmental contamination, each individual person also contributes in their own unique way.

Teachers remarked that, although there were clear benefits from attending the programme, there were also improvements that may be taken by the programme in future. Teachers, for example, believed that the time allotted for Fundisa for Change training was inadequate for them to properly understand all of the subject-matter knowledge and diverse skills offered by the program. They stated that they were still hoping for further program activities that might be used in the classroom to cover environmental impact-related lessons. Teachers agreed that the training should cover methods for teaching environmental impact issues to big, crammed courses in places where most students lack access to suitable learning resources. I believe that training should not only teach teachers how to teach big groups of students, but also how to improvise during a lesson when teaching under such circumstances. The program's requirement that teachers cascade the knowledge they had acquired to other teachers who had not attended the training was also addressed by the teachers. However, they believed that since teachers had to cover all of the material before students wrote their exit level summative assessment, it was challenging for them to cascade this information. I challenge the claim that educators do not have enough time to discuss environmental impact matters with their colleagues because they can do it on Saturdays and after-school hours. I think that in current technological age, teachers may readily exchange knowledge through email, Facebook, Twitter, Instagram, Telegram, WhatsApp, and other social media platforms.

Teachers suggested that the Fundisa for Change training be made available to more teachers from a variety of schools so that knowledge about the teaching of environmental impact subjects might be spread throughout the province of Mpumalanga rather than only concentrated in a few chosen schools. The participation of more instructors in the training, as stated by the teachers, will also help schools acquire the skills and knowledge required to teach ESD issues in the CAPS curriculum.

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