

Research Article**Reflections on the Integration of Environmental Education by a Primary School Teacher***Lettah SIKHOSANA¹ **Abstract**

The integration of environmental education is embedded with challenges such as inadequate knowledge of what environmental education entails. This situation was not different to what was encountered during the researchers' training to be a teacher from the schools where they acquired their teaching practice. It was observed that there was minimal or no integration of environmental education in the teaching and learning process. Therefore, this paper reflected on how a primary school teacher integrated environmental education in teaching and learning. The findings from this paper may assist teachers in developing a positive approach to the process of ongoing attempts and the will to integrate environmental education. It may expose the kinds of knowledge other teachers have of what environmental education entails and its integration in school subjects as well as the instructional strategies that they use. The focus on the challenges and the opportunities may excite teachers in that those who have similar circumstances would use the findings from this paper as a launch pad to work on their strengths or weakness in the endeavor to integrate environmental education.

Keywords: Environmental education, challenges, teacher knowledge, integration

1. INTRODUCTION

Environmental education must be both pervasive and integrated. If a child acquires a particular broad environmental understanding and knowledge, they will develop a social conscience attitude that will affect actions towards the environment as a whole. Which is the reason why [Corpus San Andres, and Lagasca \(2022\)](#) suggested that an integrated, interdisciplinary instructional program should be developed in environmental education which is designed to promote an environmental awareness and sociological attitude. As it reflects on how continuing teacher professional development programmes may be designed and implemented to support teachers to work creatively with a content and assessment-referenced national school curriculum ([Songqwaru & Shava, 2017](#)). Even though the South African Curriculum and Assessment Policy Statement (CAPS) advocates for the integration of environmental education in all grades and subjects ([Hebe, 2019](#)). There is still a lack of human capacity and resources by a majority of schools across the country, which raised assumptions that South Africa has decent policies to fulfil the integration of environmental education while the implementation level of these policies still lags behind ([Tikly, 2019](#)).

[Sikhosana Mudau, and Msezane \(2020\)](#) conducted a research which focused on the integration of environmental education in teaching and learning process. While [Shabalala and Msezane \(2020\)](#) explored how teachers and learners perceived the integration of environmental education into the curriculum. Which led [Munasi and Madikizela-Madiya \(2020\)](#) to look into the implications for the integration of environmental education specifically in Life Science subject. However, there is still a lack of research conducted in relations to the progress made when it comes to the implementation of

Received Date: 21/10/2022

Accepted Date: 31/10/2022

Publication Language: English

To cite this article: Sikhosana, L. (2022). Reflections on the integration of environmental education by a primary school teacher. *International e-Journal of Educational Studies*, 6 (12), 246-254. <https://doi.org/10.31458/iej.1198123>

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environmental education (Makokotlela, 2021). Hence, necessary support is needed amongst teachers in order for them to be able to steer agreed upon values that can contribute towards the effectiveness of environmental education integration (Setlhodi & Lebeloane, 2014). Furthermore, it is important to acknowledge participant attributes and knowledge when conducting this research as public perceptions of environmental education are embedded with a lot of misconceptions due to challenges that the teacher encountered. Hence, it is clear that environmental education is the most important aspect in the field of education as it can contribute towards addressing misconceptions various teachers have.

According to Saylan and Blumstein (2011) environmental education has failed because:

- a. it is not keeping pace with environmental degradation.
- b. schools have failed to practice what they teach as they neglect education in and for the environment.
- c. it neglects the effectiveness of the environment and is more concerned with environmental problems rather than finding solutions to overcome and resolve such problems.

A learning environment is made up of the diverse physical locations, cultures and contexts in which learners learn. In this study, the researcher conducted interviews and lesson observations in different learning environments. This had a direct and indirect influence on the paper based on how environmental education was integrated. Thus, it is the responsibility of a teacher to ensure that what they teach is relevant to the present and future lives of learners to ensure sustainable development.

Environmental learning is education about the environment, in the environment and for the environment with the main aim of integrating environmental education. The Institute for environmental learning (2011) promotes:

- Making informed and responsible choices
- Integrating science and social sciences with a multi-disciplinary approach
- Identifying individual's cultural values
- Critiquing societal and industrial practices that contribute to environmental problems
- Learning about the Earth's ecosystems

According to Zafar (2021) education about the environment, education in the environment and education for the environment are important approaches to environmental education as:

- education about the environment: is mainly concerned with providing enough information about the environment and the environmental problems. Learning about the environment supports individuals to develop an understanding of the environment, its challenges and the solutions needed in decision-making.
- education in the environment: is focused on any form of teaching and learning that takes place outside of the classroom environment which can be taught in a practical manner through direct experience as it has strong links with outdoor education.
- environmental learning as an education for the environment: it develops attitudes and values which trains individuals to make choices that maintain and improve the quality of the environment as it seeks to change the behavior of individuals towards the environment. Education for the environment needs to teach and encourage people to take part in environmental activities and to believe that their efforts can have an impact on the environment.

As a result, environmental learning cannot take place in a classroom environment only, but it can take place anywhere, from formal learning environments to informal learning environments which include parks, environmental programs, nature reserves and much more.

1.1. Purpose of Research

The purpose of this research was to reflect on the integration of environmental education by a primary school teacher. Furthermore, to understanding the nature of teacher knowledge in relation to

environmental education. Moreover, to present challenges that the teacher encountered towards the integration of environmental education.

2. METHOD

2.1. Research Model

This study employed a qualitative interpretative case study. The researcher used a qualitative research method to access thoughts, opinions and beliefs of the participants in order to enhance a deeper understanding and reflect on how the teacher integrated environmental education in teaching and learning (Sutton & Austin, 2015). In order to achieve this, an interpretative research paradigm was necessary to enable the researcher to interpret and understand teacher's knowledge in relation to environmental education as well as the challenges that the teacher experienced when integrating environmental education (Sikhosana, 2022).

2.2. Participants

A number of three participants were involved in the main research but for the purposes of this paper only one participant which is a primary school teacher was focused on. This primary school teacher taught the following subjects; Natural Science and Technology as well as Social Sciences in grade 6 and has a teaching experience of 5 years. The researcher used purposeful sampling to select the participant based on the purpose of this paper with the belief that the teacher will provide rich and unique data (Suen, Huang & Lee, 2014).

2.3. Data Collection

Data was collected through interviews and observations. The researcher conducted pre-observation interviews as well as post-observation interviews. This was done with a motive of ensuring what was said by the teacher corresponds with what the researcher has observed. For the purpose of triangulation, lesson observations were conducted. An observation tool and audio recorder were used to collect data during lessons observations to ensure accuracy of data collected for data analysis.

2.4. Data Analysis

The collected data was presented through themes and categories category and themes. A typology approach was used to analyse data based on the purpose of this research (Hatch, 2002). This was a single case study and the pseudonym of the primary school teacher was Mr Maphosa. The transcribing process was done using the analytical framework. The researcher transcribed all audio interviews and lesson observations word for word. The grammatical errors were not corrected to ensure that all data collected does not lose its original meaning.

3. FINDINGS

It was imperative for this research to tap into what the teacher understands about the key concepts that are interrelated with the integration of environmental education. The teachers' understanding of these concepts plays an important role in shaping the purpose of this research. As a result, the teacher was requested to give details based on what he understands about the word "environment". Mr Maphosa's response was broad as he indicated that environment can be defined in various ways depending on the approach of certain topics that he engages himself with. He revealed that environment is based on the surroundings, where there is life and even where there is no life. Mr Maphosa said that:

"The environment is based on the surroundings where we are staying, it depends on where you are. Now, when we talk of surroundings and the environment, we are referring to a situation whereby there is life and even where there is no life. It will depend on the approach of the topic that we are dealing with yes."

Mr Maphosa's response prompted the researcher to ask him what he understood about the concept "environmental education". The teacher believed environmental education refers to being educated by your surroundings. He mentioned that:

"Being educated by your surroundings, for example being taught on how to take care of your environment. Having a skill to see problems that affects your surroundings and find ways on how to solve them"

The evidence underpinning Mr Maphosa's statement was comprehensive because during lesson observations it was observed that he presented a lesson on recycling, whereby he taught about issues that affect the environment, which in this context was pollution and landfills that are not managed properly. This was evident in the statement below:

"Pollution right, is going to be exposed. So, remember we do not want to pollute the surrounding. It is very much important to make it a point that our surrounding is conducive, therefore we must prevent that, we must prevent pollution. Whenever we dump something there, and we leave it, whenever there is wind the wind we blow the rubbish and our surrounding is polluted."

Furthermore, Mr Maphosa was able to relate the lesson of recycling to real life situations that affect the environment in a way that encourages learners to improve and resolve environmental challenges. He did so by giving them an illustration of what is currently happening in the community that they are situated in so that they can develop a deeper understanding of environmental issues. He mentioned that:

"There are old women and men that use to move along the road, collecting tins and bottles. They are taking those tins and bottles for recycling. You understand what I am saying?"

Mr Maphosa's assertions led the researcher to find out what he understood about the concept of "integration". He defined integration as taking different subjects and looking for what is common in them, he even engaged various examples to ensure that one can easily understand what he meant. He mentioned that:

"To integrate is to take different subjects; for example, you look for what is common in it, and whenever you are teaching that subject, you refer to the other learning areas."

However, as much as his above-mentioned statement was broad at first glance, he elaborated further to support his description so that it could have a clearer meaning. He asserted that:

"For example, I can integrate science with mathematics, if I take learners outside and say let them be in groups, then I tell them to make groups of five members, it is also part of mathematics. I am integrating, I am not be teaching in digits; but I will be talking about numbers. In addition, I will be talking about numbers when I say let us go to a dumping zone to sort materials, we will also count them, by doing so, we will be integrating."

Based on the statement above, it was evident that Mr Maphosa was not able to explain the concept of integration effectively as he mainly depended on illustrations. Nevertheless, he was able to present various examples that demonstrated how the integration process takes place in the teaching and learning process. Therefore, based on the data that was collected from the interviews and lesson observations it was evident that Mr Maphosa had a correct conceptualisation about what environment, environmental education and integration entail. Starting a lesson topic with prior-knowledge serves as a benefit for teachers as it enhances effectiveness in the teaching and learning process. In addition to that, it contributes towards making a lesson as engaging as possible. It allows teachers to tap into

existing knowledge that learners already have. The teacher was observed implementing prior-knowledge when he taught about recycling. He applied prior-knowledge by asking questions about what recycling is and why is it important to separate rubbish if you wish to recycle.

During lesson observations it was noticed that the application of prior-knowledge was not evident in some of the lessons that the teacher presented, especially when he taught about careers in chemistry, mining and waste management. As a result, the teacher was unable to tap into the knowledge that the learners had already developed. His main concern was just curriculum coverage and the completion of the separation of ink by chromatography practical assessment on time.

In the course of the interviews, Mr Maphosa was questioned about the misconceptions that are connected with the integration of environmental education. In the beginning, his response about the misconceptions was broad, which made it challenging for the researcher to comprehend what he meant. He stated that:

“Sometimes we take things easy to say integration of environmental education issues in education they are not right, because sometimes we take the learner to dumping zones it is not nice (safe). However, remember for learner to know that, we have to take them there because now they must experience and see what is said of when we talk about environmental impact; they must see it and they should be able to have an input on what they observed.”

Based on the above statement, the teacher believed that misconceptions of environmental education are caused by the conflict of interest between what is right and wrong about the integration of environmental education. He indicated that different learning environments are not catered for as teachers normally prioritise the safety of learners which leads them to be reluctant towards the integration of environmental education. As a result, they develop misconceptions that environmental education cannot be integrated in various ways because they are not aware of safety measures that they can implement; to avoid any dangers that can occur in different learning environments that are perceived to be not conducive to learning.

Nevertheless, Mr Maphosa had a misconception of the integration of environmental education. He was of the opinion that the integration of environmental education can only be integrated in some school subjects and through practical assessment. This was evident from the statement below:

“Some schools subjects have contents on how to take care of your environment for example pollution. While they are being taught about that a practical assessment can be done so that they can aware or shown practically how are we polluting our environment and given clues on how that can be solved.”

Based on the above statement, Mr. Maphosa developed a misconception because environmental education is integrated across all subjects in the Curriculum Assessment Policy Statement in South Africa and there are strategies that can be used other than practical assessment to integrate environmental education. Thus, it was evident that the teacher had a limited amount of knowledge when it comes to the integration of environmental education. During post-observation interviews, Mr Maphosa mentioned a statement that was contrary to what he did, especially when he was asked about the part of the lesson presentation that he enjoyed the most. He stated that:

“The separation of mixtures of colour especially when I investigated the black I found that black is a secondary colour, and I found out that black is made from different colours, that was so much interesting.”

Taking this statement into account, it developed into a contradiction based on what the teacher said and did about the integration of environmental education in teaching and learning. In fact, it became a misconception because during lesson observations there was no experiment or practical that

took place whereby the teacher was seen investigating the mixtures of colours, even his findings are not accurate because there was no evidence that supported what he asserted.

Mr Maphosa was asked about the challenges that he experienced when he had to integrate environmental education. He mentioned that a lack of learning materials and school environment contributes to the challenges when he had to integrate environmental education. He stated that:

“Challenges are always there, because when you integrate environmental education, sometimes you might not have enough material to use in class, especially those that can help learners to easily understand, sometimes you want to integrate education with the environment, but the school situation does not allow us.”

It was important for this research to find out about the opportunities of integrating environmental education in teaching and learning. The teacher asserted that he does integrate environment education in the teaching and learning process. His positive response prompted the researcher to find out how he integrated environmental education. His statement emphasised more on using different learning environments in order to enhance better understanding of the lesson content presented. He asserted that:

“Whatever we are experiencing outside, we must take it into a classroom situation. Whatever we are talking to learners, some learners might understand visual things. So now, whenever we take something on the environment outside into a classroom situation then learners understand it better.”

His response led me to find out more about the importance of integrating environmental education as it contributes towards an opportunity that will enable the teacher to be able to integrate environmental education effectively. The teacher indicated that it is important to integrate environmental education in teaching and learning process. He asserted that:

“I think it is important because when you talk of environmental education (remember the environment is a situation whereby we live), therefore, whenever we talk about the environmental education we are looking at the different things that we come across. For example, if we talk of conducive hygiene, therefore it means we must talk about the environmental issues.”

Based on data collected from interviews and lesson observations, it was evident that the teacher was aware of the importance of integrating environmental education as well as challenges and opportunities that are associated with it. As a result, the teacher was able to recognise the importance of integrating environmental education.

4. DISCUSSION

According to the Department of Environmental [Affairs and Tourism \(2014\)](#), the concept of environment is widely used and has a broad range of definitions, interpretations and meanings. This was similar to what Mr Maphosa has alluded that the environment refers to surroundings, which is also a situation whereby there is life and even where there is no life. This statement relates with the Department of Environmental [Affairs and Tourism \(2014\)](#), which defined the concept of environment as surroundings in which humans and other organisms exist. Furthermore, [Zafar \(2018\)](#) defined environmental education as a holistic procedure that is aimed at creating responsible individuals who can identify environmental problems, engage themselves in problem-solving and act towards protecting the environment. This was similar to Mr Maphosa as he defined environmental education as a process that enables one to be educated about their surroundings, being taught on how to take care of the environment and having skills to see the problems that affect their surroundings to come up with solutions to resolve them.

The teacher showed insufficient knowledge about the concept of “integration” as he mentioned that it refers to taking different subjects and looking for what is common between them. His statement was broad, as much as he did not manage to illustrate the concept itself. Prior-knowledge has long been measured as the most important factor that has an impact in teaching and learning according to [Hailikari, Nevgi, and Lindblom-Ylanne \(2007\)](#). These important considerations were partially evident in the lessons that were presented by the teacher. Prior-knowledge was administered when he taught about recycling but that did not materialise as it was difficult for learners to connect the new content to what they already knew.

The insufficiency of a teacher in content knowledge is regarded as a main cause of misconceptions. Based on the research findings, it was evident that the teacher had a wrong conceptualisation of the integration of environmental education in teaching and learning. He was of the opinion that only some school subjects have content on how to take care of the environment, which was a misconception. The integration of environmental education is referred to as a cross-curricular phase organiser which needs all teachers in all learning areas to consider an environmental focus ([DBE, 2011](#)). Hence, environmental education content is integrated in all subjects and levels of the schooling system which is Grade R to Grade 12 ([DBE, 2011](#)).

During lesson observations and the interviews that were conducted it was evident that the teacher encountered a lot of challenges when he had to integrate environmental education. Mr Maphosa mentioned that a lack of learning materials is one of the challenges that he experienced when he had to integrate environmental education. This relates to the research that was conducted by [Safta-Zecheria, Ștefăniță, Negru, and Virag \(2020\)](#) who found that teachers were challenged by access to resources, which in this regard is learning support materials, which made it difficult to integrate environmental education. Mr Maphosa also encountered challenges with the issue of not having seniors. This relates with [Rahman Halim, Ahmad, and Soh \(2018\)](#) who indicated that a lack of support from the school administrators and relevant stakeholders are one of the contributing factors that leads to challenges that impedes the integration of effective environmental education. Which is why necessary support is needed from school management teams in order for them to be able to steer agreed upon values that can contribute towards the effectiveness of environmental education integration ([Setlhodi & Lebeloane, 2014](#)).

In addition, an inadequate school environment and lack of apparatus served as constraints that hindered the teacher in integrating environmental education in teaching and learning. School classrooms, buildings, laboratories and equipment are considered to be the most important elements of learning environments in schools, as they are able to enhance better instruction and improve learning outcomes ([Teixeira et al, 2017](#)). Thus being said, it is important to acknowledge that the school environment is capable of affecting learning through three inter-related factors such as stimulation, naturalness and the flexibility of learning environment. Thus being said, it was quite clear that the lack of access to teaching and learning materials has been an on-going challenge that seems to be the most contributing factor that impedes the integration of environmental education. These constraints have a negative impact on environmental education as it cannot be integrated effectively ([Rahman et al, 2018](#)).

5. CONCLUSION

The findings from this study have shown that the teacher has adequate knowledge about the concept of environment. However, his understanding led him to develop misconceptions about integration, environmental education and the integration of environmental education. Therefore, it is recommended that during training workshops these aspects must be clarified and clearly defined so that teachers can acquire adequate knowledge and skills towards the integration of environmental education as stipulated in the CAPS document. The teacher encountered challenges such as a lack of learning materials when he had to integrate environmental education. Therefore, it is recommended

that the Department of Basic Education should provide teachers and schools with adequate teaching and learning materials needed so that they can be provided with opportunities to integrate environmental education effectively.

The teacher did not integrate environmental education adequately and across the curriculum. Therefore, it is recommended that the school, together with teachers, should introduce continuous environmental education programmes or competitions that cater to the curriculum, as this might assist teachers and learners to be aware of the importance of sustaining the environment and acquiring knowledge and skills on sustainable development practices. It is also recommended that future studies on the integration of environmental education be carried out across all phases such as Foundation phase, Intermediate phase, Senior phase as well as Further Education and Training Phases (FET) whereby it will include several schools, circuits, districts and expanded provincially.

Acknowledgment

The data for this study emanated from my Master of Education in Environmental Education and it was collected in 2019. Advised by Prof. Awelani V. Mudau and Prof. Sikhulile B. Msezane. I am also grateful to the teacher who contributed to this work and the primary school where this research was done.

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