



Learners' Knowledge of Environmental Education in Selected Primary Schools of Tshwane North District, Gauteng Province

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Abstract: *This study focused on determining the level of environmental education knowledge and skills among primary school learners in South Africa under the National Curriculum Statement Grades R-12. Environmental education is important in the promotion of sustainable environmental conservation, and reducing negative effects which are caused by adverse climatic conditions. We used qualitative approach for data collection from eight primary schools located North Tshwane District of Gauteng province through interviews and observations. The sample comprise teachers, the learners and non-teaching staffs working in the schools. The findings from interviews suggest that the curriculum offers learners adequate environmental education knowledge in the Social Science and Natural Science subjects. Similarly, results from observations show, from visual sights of the surroundings of the schools, that the school compounds have gardens, tree nurseries and tree plantations, and clean environment around the school compound. In conclusion, learners are provided with adequate environmental education knowledge and they are able to contribute towards maintaining clean environments and conservation in their communities.*

Keywords: *Environmental Education, Knowledge, Conservation, Clean Environment, Curriculum.*

1. INTRODUCTION

Development of children requires them to be provided with relevant education and skills that can enable them to understand what challenges exist in the society and what they can do within their capacity to contribute to sustainability in the society especially by fighting climate change. Primary school level is the first point of entry in the education sector whereby learners get into contact with world education. This entry point thus provides an opportunity for education stakeholders to ensure that they design and provide a curriculum for teaching which incorporate environmental education (Kimaryo, 2011).

As at the 2020 national statistics, South Africa has a population of 58.7 Million in 2019. The



birth rate was at 21 births per 1000 people with a death rate of 9 deaths per 1000 people. By average, the growth rate is 1.43% annually. This growth is alarming as it is causing gradual pressure on the natural environment. There is a possibility that if necessary actions will not be undertaken, the region will be suffering from depletion of resources and possible aridity conditions will set in. This aspect calls for the need to conserve the environment and sensitize the population on conservation importance and how they can participate in conservation efforts. Children at primary school level are at a good position to be provided with environmental education so that they can grow while being well informed and ready to embrace conservation efforts.

Environmental learning focus either as a theme or a principle is an unprecedented change that has been introduced to South African curriculum and this calls for stakeholders such as teachers, policy makers, parents and learners to embrace the knowledge and ensure that each and every individual in the society they are well informed of this information and they are working towards ensuring that everybody is well informed of the society conservation efforts (Le Grange and Reddy, 1997).

Like other countries, South Africa is one of the members of International Conferences on the Environment. The country has responded to global concern on environment and on international declarations through including EE to the curriculum that is taught in the schools from late 1990s. The initiative by SA government to integrate environmental education to the education curriculum is commendable because conservation is an ideal concept that should be embraced as it helps in reducing adverse climate change into the society. moreover, the economy of South Africa relies heavily the country's natural resources such as vegetation and minerals. Therefore, there is need for the country to take serious conservation aspect in order to safeguard the environment for future benefits to be achieved (Sullivan, 2013).

The life support of the environment is being threatened by manmade environmental issues and problems like floods, draughts, poor sanitation, land degradation because of engaging in poor agricultural practices, unsuitable mineral harvesting practices and loss of biodiversity. Despite some of these activities increasing the food basket of the country, they need to be controlled in such a manner that they will not pollute the environment and affect future sustainability issues. Educational activists in South Africa must be aware that there is a growing challenge and urgent need to re-conceptualize the process of listing important aspects of conservation in the environment in order to ensure that they are able to sensitize other stakeholders in the education sector to take conservation seriously in order to save the world from degradation of the environment which directly contribute to causing climate change in the society.

This research was conducted with an aim of determining the level of environmental education awareness which the education sector is contributing to learners in primary school level. Understanding Environmental conservation from an early development stage of primary school provide learners with an opportunity to understand and develop knowing what is the importance of conserving the environment. The objectives therefore were:

- a.** Determine whether learners are provided with adequate environmental education at primary school level
- b.** Analyze conservation efforts which are undertaken by learners which are related to learning outcomes of environmental education provided in South Africa primary schools.
- c.** Identify challenges and opportunities that are facing environmental education provision in primary school education level in South Africa.



Despite the incorporation of environmental education into the curriculum, the research however noted that the schools faced a challenge of inadequate resources and varying number of staff members both in teaching and teaching staffs. This is an hindrance to policy and environmental education teaching and implementation because resources are needed to reduce the learner to teacher ratio when teaching so that these learners are able to get adequate attention from their teachers an aspect that will contribute to increasing learner's understanding of what conservation is and how they can control degradation of the environment adequately. The fact that South Africa is a developing country makes it to be faced with a challenge of lack of enough resources that can be used to finance the education sector. Having a challenge of accessing resources has made it difficult for balanced development in terms of infrastructure to be achieved especially in public learning facilities such as primary schools which rely on government funding to finance their operations. The ministry of education has more to do in terms of soliciting more resources so that they can be channeled to learning centers so that learners can be provided with sustainable infrastructure, learning materials such as books and hiring of teachers who will be used to provide teaching to the learners.

Implementation of environmental education in the education system however is not an easy concept and this has provided a challenge to educators. Esland (1971) noted that introduction of environmental education into the school curriculum represent challenges to the dominant conceptions, organization and information transmission. This aspect causes conflict among teachers with their teaching and learning approach. Despite therefore the integration of environmental education into the education system, implementation of this knowledge has been a challenge and this aspect has made learners to be unable to adequately access and practice what environmental education information details.

Literature review

The motive of teaching environmental knowledge at the primary school level arises die to the need to develop future leaders who are able to make informed decisions and contribute positively towards development of the society. to be able to teach effectively, teachers first of all must have adequate knowledge in the content which they are required to teach learners. This aspect implies that during training of teachers before they are employed, they must be able to be provided with relevant skills on environmental conservation practically so that they will be in a position to teach learners what is needed and ensure that they are able to understand and practice conservation activities. Shulamn (1986) emphasized on the need for teachers to be adequately educated so that they can teach learners important concepts especially on conservation and climate change. According to Shulman (1986) teacher's knowledge which is referred to as pedagogical context knowledge should be ensured that it also contain the concept which the teacher is going to teach learners in the school.

Environmental education contemporary forms were first introduced in South Africa in mid-1970 by the Belgade Charter of 1975 and Tbilisi principles of 1977 as analyzed by Gough (2006). Before introduction of this information, prior knowledge only focused on basic ecology interpretation and soil erosion discussions which were not detailed. As part of government intervention to ensure that environmental education was embraced and being taken seriously in conservation of the environment, African National Congress embraced conservation ideas and they implemented them in the 1994 education framework. This aspect led to the Environmental education curriculum initiative to be established as a joint initiative of the state



and civil society partnership to help in curriculum development to design C2005 curriculum.

The inceptions of C2005 enabled themes such as environmental management scope were taught in school. Concepts such as environmental management and all forms of pollution were embedded in the curriculum and this aspect led to the emphasis of conservation and environmental management. Issues such as pollution, deforestation and overpopulation was also prioritized in the curriculum so that the public can be adequately sensitized on the importance of conserving the environment for sustainable growth and development.

The main aim of including environmental education is to align global education with environmental concerns that is rapidly rising on the globe (Monroe et al., 2013). The protection of the environment is entirely the responsibility of each individual in the society because since every individual is living in the society, they must take care of the environment where they are residing (Jorgenson et al., 2019). The millennium development goal of creating environmental sustainability provides an opportunity for stakeholders in the society to draft appropriate framework which can be used to safeguard the environment and protect it from any form of degradation.

By virtue of education provision, the education sector is in a good position to transform the society by providing knowledge and skills which is needed for transformation of the society. Separating the education system into distinct levels from primary school level, secondary and tertiary education level provides an opportunity to stakeholders to design a curriculum that is suitable based on the thinking capabilities of the learners in each education level. Learners in the primary school level are in a better position to be provided with environmental education gradually because this is a stage in which they are learning and being introduced to general knowledge and technical skills that can enable them to be able to grow and develop positive knowledge as they develop on matters of conservation in the society. The fact that many of the primary schools in South Africa are located in the rural and peri-urban centers provide an opportunity for the education sector to design their curriculum in such an opportunity that will enable learners to embrace conservation efforts from their early development (Stanišić and Maksić, 2014).

To achieve the millennium development goals, illiteracy should be eradicated in the society and this can be done through empowering and adequately financial the education sector so that stakeholders in the sector can be able to educate the general public on the importance of environmental conservation. This is essential in ensuring that future generation is well equipped with environmental conservation information and they can be able to relate and take part in conservation efforts adequately. Paw and Yaday (2017) claimed that environmental education is the process of developing awareness among the people and enable people to acquire knowledge on the environment, how they can conserve it, what negative effects arise from neglecting and polluting the environment and what does it take to encourage and foster sustainability of the ecosystem. According to Nhamo and Mjimba (2020) environmental education is intended to:

- a. Help in improvement of the quality of environment.
- b. Create awareness on the challenges and problems affecting the society which are related to neglecting of the environment.



- c. Create an ideal and enabling environment for people to make and enforce conditions related to conservation and how they can conserve the environment.
- d. Foster development of mechanisms which can be used to execute environmental development plans.

Environmental challenges such as conservation, pollution, population growth and scarcity of resources are all important aspects which should be translated into curricular content that can easily be taught in education institutions (Kováčová and Vacková, 2014). Curriculums should be reviewed and changed periodically to ensure that any developments that is coming up in the environment must be incorporated in the curriculum so that learners are aware of it and can participate in transformation of the environment. Whereas environmental education can be specific to a certain geographical location, many issues within the broad concept of environment are similar globally and this makes environmental education to be broadly categorized into three distinct groups that is biological aspect, physical aspect and socio-cultural aspects (Erdogan et al., 2009). Curriculum development is an all-round initiative that is being influenced by a number of factors such as political, economic, social and technological aspects. In regards to the economic contribution, the economic development of a country depends on education development. During curriculum development, the developers must ensure that they design a curriculum that can be able to promote economic development in the country (Dube and Jita, 2018). The type of knowledge that learners are provided with in education institutions will enable them to understand and contribute towards economic development and therefore, the designers of the curriculum must ensure that it incorporates every aspect that can lead to development in the society.

In the 21st century, technology commands and control a lot of activities and operations including the learning institutions. Curriculum developers must ensure that the type of curriculum which they design has got room to incorporate technology so that learners are able to learn relevant development and transformation aspects which will result to evenly development of the society. incorporating technology in curriculum development will therefore empower learners to not only study basic education skills but also be in a position to get to understand what technology entails and how they can tap on the growing technology to expand their knowledge, talents, skills and knowhow (Molapo and Pillay, 2018).

The political situation of the country also influences curriculum development. The type of leadership and transformations that are being undertaken by the elite class also influence outcome of curriculum development especially in designing history subject curriculum. Various political transformations that have taken place in the country must be incorporated into the curriculum so that they can enable learners to understand transformations since the colonial era until now and how has the transformations helped in improving the life of South Africans. On the other hand, the cultural aspect revolves around community development, origin and interactions. This concept must be incorporated into the curriculum so that the upcoming generation can be able to understand their origin and what it takes to conserve their traditions.

The rising global warming effect and eventual rising of water levels in the oceans due to melting of polar ice calls for curriculum developers to work towards ensuring that developments in curriculum goes in hand with what is currently happening in the society and in the globe at large so that the millennials and Generation Z upcoming can be able to understand what is needed to control such adverse climate change conditions. Therefore, the curriculum should reflect and address multiple challenges that is affecting the society.



The future development phases of the curriculum should incorporate issues such as gardening, littering environmental management, vandalism. Moreover, food production, pollution, natural disasters and recycling activities. The education development as noted by Simpson, (2002) should incorporate pertinent issues affecting the society at large and which are developing. Collins, (1980) noted that environment education must be provided extensively and cover issues that are affecting society development especially matters to do with global warming and climate change.

Learning cannot be done without access to relevant learning materials such as books and other publications which will be used as reference materials for teaching. Educators have been at the forefront of challenging and changing situations we have found ourselves in, whether politically, psychologically, emotionally and physically. Teachers are game changers and need to be well-equipped to change the world. Their readiness means a lot to us. Education has always been the most functional tool for tackling problems, and there is no doubt that today's education will influence the world of tomorrow. Therefore, education can be one of the most important tools for YY6T tackling the challenges of human advancement in the contemporary world (Bogner and Wiseman, 1997,) (Rezaei et al., 2016). Environmental education development is one of the main tasks of any community (Kals et al., 1999); Heimlich and Ardoin, 2008). Therefore, the transfer of environmental education to students is the task of schools. In this regard, teachers should be prepared to transfer knowledge and environmental information to students (NRC, 2007) Kamar et al., 2015). Educators have been at the forefront of challenging and changing situations we have found ourselves in, whether politically, psychologically, emotionally and physically. Teachers are game changers and need to be well-equipped to change the world. Their readiness means a lot to us. Education has always been the most functional tool for tackling problems, and there is no doubt that today's education will influence the world of tomorrow. Therefore, education can be one of the most important tools for YY6T tackling the challenges of human advancement in the contemporary world (Bogner, 1982 and Rezaei et al., 2016). Environmental education development is one of the main tasks of any community (Kals et al., 1999 and Heimlich and Ardoin, 2008) Therefore, the transfer of environmental education to students is the task of schools. In this regard, teachers should be prepared to transfer knowledge and environmental information to students (NRC, 2007 and Kamar et al., 2015). The education sector therefore requires active transformation and periodic review of learning materials in order to ensure that the curriculum contain secondary point of materials for reference.

Research strategy

We collected data through qualitative approaches from teachers, the learners and non-teaching staffs working in primary school levels located in North Tshwane District, South Africa. The primary purpose of this investigation was to determine the level of understanding of environmental education among learners. We framed our research within the interpretive paradigm, which emphasizes the exploration of meaning through language and understanding of the context in which events occur (Bailey, 2014). The sample of the study included teachers (n=10), non-teaching staff (n=) and learners (n=80).

We used interviews and observations techniques to collect data. Large chunk of information was collected through the interviews. In regards to observation technique, we observed learner behavior and attitudes within specific formal and informal contexts in order to obtain



accurate information relating to the environment and environmental education as a whole. The main reason why we used observations is that an environment is the perfect reflection of attitudes and knowledge even when people are absent according to Van and Dunlap (1981). Scientists use observation to collect and record data (Eberbach and Crowley, 2009). We used standardized open-ended questions (Turner, 2010). We kept the questions identical throughout the interviews (Aksu, 2009)

We analyzed the data through the use of content analysis technique whereby we read the content and grouped it into themes which can be easily analyzed and interpreted. After coding of the research, we were able to generate and understand concepts that was collected from the research based on the interpretation and thoughts of respondents that we engaged in the study. Since the research involved three different respondents, there was need to expand the findings so as to understand what is contained in the information collected and how majority of the respondents answered the questions presented to them. The technique involved reformulation of stories presented by the respondents by taking their thoughts into account and analyzing different experiences of respondents in order to be able to generate comprehensive research findings that correlates with environmental knowledge research needs.

Findings

Curriculum subjects Teaching Environmental Education.

The respondent's states that the main subjects which helped them to learn about environmental issues by providing them an opportunity to teach and learn respectively about environment were natural science and social science. They noted that these two subjects contain various provisions which helped in shaping learners access basic knowledge on environment studies. Earth education is perceived by teachers interviewed as a competent and necessary environmental education which will help learners to build a sense of strong relationship with the natural world and also be able to interact with the living world. Teachers noted that providing environmental education studies through social science subject encourage the development of sensory awareness among learners which help them to participate in environmental conservation efforts by developing an understanding of life and what contribution they can make towards sustainability and green conservation efforts.

Social science studies in South Africa covers History and Geography. The content of this subjects relates to natural ecosystem and environmental impact of human activities towards the ecosystem. As noted in a research by (DoE, 2021) this curriculum teach learners issues related to environment by incorporating aspects such as significance of water bodies and how they can be conserved, human activities and how they contribute towards conservation of natural ecosystem.

Natural science on the other hand as noted by the teachers who were interviewed claimed that the subject combines life science, chemical and physical sciences. The respondents noted that natural science subject accounted for 50% of environmental issues in form of the contribution of natural science in conservation and preservation of the environment. The education system also allows learners to study Life Orientation subject. The subject is based on understanding of the constitutional rights of South African citizens, promotion of human health, physical education and environmental responsibilities.

The blend of different subject as noted by the interviewed children and through observations has made them to be active on matters of conservation of the environment as they were actively



involved in tree planting exercises with the help of their teachers and other non-teaching staff in the school. Teaching learners Afrikaans language and Setswana has helped in disseminating education to learners in the local language that they can understand better based on the fact that Tshwane North District contain a large percentage of poor and middle income earners who converse in various local languages. The Afrikaans and Setswana are some of the home languages spoken in the region. It is therefore easier to explain to these student's critical things such as environmental conservation efforts because they understand well local language than English language.

Teachers interviewed also claimed that they used home languages to explain issues and concepts which are related to conservation efforts. By explaining in home languages, the learners can be able to understand well what is expected from them especially when it comes to matters of conserving the environment. The non-teaching staff also contribute towards conservation of the environment through helping teachers to support children in participating on conservation efforts within and out of the school environment. All education stakeholders are therefore important in environmental education provision and practice.

Sources of environmental education.

Teaching aspect requires to be complemented with availability of learning materials so that learners can be able to make references and build their knowledge and understanding on different issues which relate to the environment. There is limited internet coverage in the region and the findings noted that internet was less popular as the source of environmental education in Tshwane North District region. The less popularity of internet unlike other region can be attributed to the fact that in primary education level, the children have limited exposure as there is less internet infrastructure in the schools as compared to high school and tertiary learning institutions.

This aspect has made internet to be less popular among children in primary schools engaged in the research. The information sources may be out of formal class lessons but they are accessible from within the school environment and outside of the school including from the surrounding community where the learners live. Moreover, as noted by Altin et al., (2014), in a study conducted in Turkey, the mass media has been used as one of the key contributor towards provision of environmental education awareness to learners both in primary and secondary education levels. This is also the case back at Tshwane North District whereby local media outlets such as Grootfm90.5, Tshwane FM, Moretele Community Radio, Radio Pulpit and Family Radio among the various channels listened locally. They have contributed in sensitizing the community including the learners on environmental insights which include sensitizing them on the need to conserve the environment and how they can conserve the environment for the betterment of the society and creation of sustainable universe. In regards to formal learning in schools, the research noted that books and other publications available in the school library helped to provide EE to learners by complementing the knowledge that teachers provided to learners in class and practical lessons.

Awareness of Environment problems.

It is important to first of all determine on whether the learners in these schools are aware of environmental problems that exist in the society. This is essential as the first building point in determining the success of teaching programs that are being used in the region whether they are effective in providing learners with relevant knowledge on conservation efforts.



Being aware of environmental challenges is a step towards providing environmental education and introduce remedy measures which can be used to address the negative impacts as noted by the teachers and support staff. It's evident that primary schools in the region are enormously contributing towards teaching learners on the importance of conserving the environment and what it takes to ensure that there is adequate awareness on the need to conserve and reduce problems associated with environmental degradation.

When tasked to respond on how they are able to acquire the vast knowledge on environmental problems, learners claimed that school events such as environmental clean-up days, tree planting campaigns, 4K clubs and also participation in national events such as charity foundation events have greatly contributed in shaping their perception on conserving of the environment and what it takes to reduce problems associated with poor environment conservation. An observation made within the school compound noted a robust of events such as tree nurseries and environmental education charts that were hanging in various classes that the researcher visited. This is an indication that learners have got adequate access to environmental knowledge which in return they use to make informed decisions when it comes to conservation efforts.

Environmental Education administration in schools.

School environment can testify whether the institutions are providing environmental conservation education to learners based on observations how the center looks like. Schools that we visited during the research posed a number of activities such as nurseries of endangered tree plant species such as eucalyptus and the blue gum in abundance in some of the schools that the researcher visited such as Baxoxele Primary school, Dilopye Primary School and Busy Bee Junior Primary school. Such spectacular scenes are a clear manifestation that the curriculum currently being embraced in the region advocates and enable education stakeholders to emphasize on conservation efforts and ensure that learners have got adequate knowledge and skills on environmental education.

External environment issues such as vandalism of school properties and the level of cleanliness were also assessed as they are part and parcel of conservation and protection efforts. The research noted a number of properties such as school desks being broken, the buildings were scrapped on the walls and also other schools were a bit clean than others a possible indication that despite provision of EE to learners, the level of enforcement of the policies and the knowledge provided differ among schools in the region. Therefore, there is need for stakeholders such as teachers and non-teaching staff to enforce implementation of these programs after teaching in class so that learners can be aware of conservation and adequately practice at the school compound.

2. DISCUSSION

The responsibility of managing the ecosystem is entirely entrusted to human beings and therefore, there is need for each and every individual to contribute towards sustainable environment development and this duty is mostly required to be supported by learning institutions which acts as academic provision centers. Evidence of environmental education provision were adequately available in the centers that the research focused on although the level of commitment was not equal through observation. This is because there was disparity in



performance and demonstration of application of the environmental education in these institutions which is attributed to the differences in topography and managerial systems that are being implemented by each head teacher in their administration jurisdictions (Gopalan, 1999).

Education on conservation cannot only be provided in education centers but also in the society where people live and operate from. This aspect implies that the government and conservation non-governmental organizations can also embrace different mechanisms such as using public gathering sites such as parks and beaches to erect signposts which sensitize the public on conservation importance (Mtaita, 2007). Moreover, mass media outlets are also playing a vital role in sensitizing the public on the importance of conservation in the society. The research findings noted robust activities within the region that act as conservation activities. Moreover, the use of print media and mass media within the region to sensitize the general public on conservation efforts are not only aimed at creating awareness to the people but they are also helping school going children to get complementary knowledge on conservation efforts that they should emulate and embrace so as to make it possible for the region not to experience adverse climate change by bringing everybody on board to engage in conservation activities and reduce negative environmental degradation attempts.

On the other hand, the attitude and the behavior of learners is critical in determining what impact does environmental education create to their lives and also what approach does the teachers use when they educate learners on environmental education programs. Attitude and behavior shapes one's interest in studying a certain concept and also it directly impacts on how they will emulate and embrace the knowledge provided for future use (Erhabor and Don, 2016). The research noted that learners were interested to learn subject concepts which are related to conservation efforts not only because it's part of the curriculum which they must learn to pass but also because the curriculum was related to real life events which happens on a daily basis. This aspect of embracing conservation efforts shows that learners are determined to learn and contribute to conservation efforts through the knowledge provided. Hence, they showcased a positive and nature embracing attitude that welcomed any effort to conserve the environment.

3. CONCLUSION

The curriculum has offered an opportunity for the learners to learn and embrace conservation activities from the early stage of development of their lives. Primary school being the first point of entry of learners to the academic world provide an opportunity for stakeholders in the education sector to design the teaching curriculum in a manner that can ensure that environmental education is incorporated in the program as it is the case with South Africa primary school curriculum. The study however proposes a number of recommendations which should be embraced by stakeholders to enhance and improve environmental education provision in the region.

1. Since the education sector is the largest government unit that is accessible across the various regions, these institutions must be empowered in what they are doing so that they can be able to focus more on conservation and ensure that learners are adequately sensitized hence being able to participate in conservation efficiently.
2. The community at large must be brought on board on sustainability matters whereby the current sensitization campaign should be extensively carried out periodically rather than only use signposts to sensitize them. This implies that public rallies such as the ones which are



being held during election campaigns must be embraced during the period of conservation campaigns.

3. Enhanced access to proper sanitation and clean water should be prioritized by government and conservation activists. Focusing on one aspect at a time within the scope of environmental sustainability promotion will result to positive improvement of the society.

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