

# AN EXPLORATION OF THE IMPACT OF ENVIRONMENTAL EDUCATION INNOVATION ON STUDENTS IN SUSTAINING LAND RESOURCES: A CASE OF MKHONDO LOCATION

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## ABSTRACT

The aim of the study was to investigate the impact of Environmental Education in learners with regard to unacceptable waste dumping which causes land degradation in Mkhondo location. Large parts of the Mkhondo area, including the informal settlement, the location and the local schools, are very untidy due to littering by the residents and learners. The study focused on the impact that Environmental Education as an extra-curricular activity would have on the students in reducing or eradicating littering. Data was collected through focus group interviews with the learners, the parents as well as observations of students at school premises. The study revealed that learners showed no concern about the negative impact of disposing of litter inappropriately even after the extra-mural activities of the initiatives made to reduce littering, which indicated that they were not concerned about the environment at school as well as their home surroundings. The initiative of Environmental Education was implemented in a short period where learners were given prepared manuals and trained on how to keep environment clean, in spite of the training learners were not fully acquainted with the responsibility of taking care of the environment and alleviating littering on the school premises. I therefore recommend that educational campaigns on appropriate solid waste disposal should be initiated in the school and in the community. Further studies should be conducted on the coverage, teaching and examination of Environmental Education impact topics integrated in the curriculum in the Further Education Training Phase.

**Keywords: Environmental Education, solid waste, degradation, unacceptable solid waste disposal, extra-curricular, litter, sustainability**

## 1.0 INTRODUCTION

Natural resource is continuously degraded by different human activities such as unacceptable solid waste disposal. According to Smartranger.net (2016) solid waste is defined as useless and unwanted products in the solid state derived from the activities of and discarded by society. Solid waste in this paper can be garbage, combustible and non-combustible waste, refuse and litter. This investigation is supported by one of the goals of Environmental Education (EE) which is to ensure that learners gain experience in investigating and resolving environmental issues (Stevenson, Ferreira & Emery 2016). This goal encouraged and aroused my desire to explore the impact of EE innovation on learners in the way they dispose solid waste in Mkhondo location. This paper explores extra-curricular activities with its objectives of raising environmental awareness towards littering in school premises and in the surrounding places. The higher environmental awareness an individual reveal, the more often he takes conscious actions that contribute to environmental protection (Piekarski, Stoma, Dudziak, Andrejko, Slaska-Grzywna 2016). Environmental awareness initiative can be initiated by incorporating EE as an extra-curricular activity. In ensuring successful awareness programmes, EE has encountered paradigm shifts since the Second World War between 1939 and 1945, this is shown by the number of local and international conferences and workshops that have been held on issues related to the environment and sustainability of land resources. In support of the statement above Loubser (2007:39) believes that “the war led to its unprecedented devastation and human suffering, which culminated in an important period of new ideas and planning for a better world”. Unacceptable human activities that were

detrimental to environmental sustainability led to campaigns and conferences that included the Rio De Janeiro Earth Summit in 1992 and the World Summit on Sustainable Development which was held in Johannesburg, South Africa in 2002. In order to ensure environmental sustainability, the United Nations held a review of the United Nations Decade of Education for Sustainable Development which started in 2005 until 2014 (UNESCO 2016). The Decade of Education for Sustainable Development was replaced by new initiatives known as United Nations 17 Global Goals for sustainable development.

All these initiatives by United Nations ensures signifies of the importance that EE is essential for both rich and poor nations, as evidenced by the 1972 Stockholm meeting for developing EE which was held in support of preserving natural resources regardless of whether the country is poor or rich. The meeting was crucial as it led to the formation of the field of EE. Consequently, even a smaller location like Mkhondo has a pivotal role to play in sustaining the environment, regardless of the socio-economic status of its inhabitants. Moreover, according to Loubser (2007:43), “since 1992 the field of EE has been widely influenced by the notion of sustainable development, with teachers advocating that EE should be focused primarily on achieving the goals of sustainable education”. Therefore, in this paper the researcher envisaged that, harmful human activities such as unacceptable solid waste disposal in Mkhondo can be alleviated by implementing and with the provision of educational activities of EE as an extracurricular activity on a sustainable basis.

In support to the above according Taylor et al. (2009) EE in South Africa is a response to environmental issues and risks. The natural resources in South Africa are not spared from environmental threats and issues such as pollution, inappropriate waste disposal, loss of biodiversity, acid deposits, global warming and land degradation. Government policies were implemented, such as the White Paper on Environmental Management Policy published in 1997, establishing good governance in South Africa in terms of environmental themes. I conducted this study because of human activities which generate massive waste that finds its way into the ground, water, and air every year according to Kamara (2006:1).

Moreover, high consumption lifestyles in many locations have major effects on how much domestic waste is produced by modern technology, while little effort is made to bring the same technology to reduce unacceptable waste disposal (Kamara 2006:2). The area of Mkhondo location is surrounded by litter on illegal dumping sites, on the roadside and even on street corners (Mkhondo Solid Waste Report 2010). This results in litter becoming a source of solid waste that degrades the land, pollutes the air, contaminates running water and poses a threat to nearby homesteads next to the Mkhondo River that use water from the river for drinking. Apart from the negative effects to humans, animals such as cattle feed on the garbage irresponsibly disposed of by the community. The following research question grounds an understanding to this paper is: What is the impact EE on the way learners preserve land resources from degradation caused by unacceptable solid waste disposal?

### **Theoretical framework**

According to Sitarz (1994: 10) “it is essential however that more efficient and environmentally sound methods of utilising resources be developed” However, human activities generate massive waste that finds its way into the ground, water, and air every year (Kamara 2006:1). Sitarz (1994) notes that the increase in the world’s population and consumption, particularly in the industrialised countries, has encouraged economic growth. Unsustainable use of the earth’s resources such as improper solid waste disposal has degraded the environment and generated unmanageable amounts of waste and pollution of the land. Apart from the global arena, Mkhondo location have been experiencing the same situation of degradation caused by solid waste disposal. **What is the impact of Environmental Education on the way learners preserve land resources from degradation caused by unacceptable solid waste disposal?** This research question of the paper is addressed by Kolb experimental learning theory. Mkhondo community has to take appropriate action based on local deficiencies in sustainability.

### Kolb’s experimental learning theory

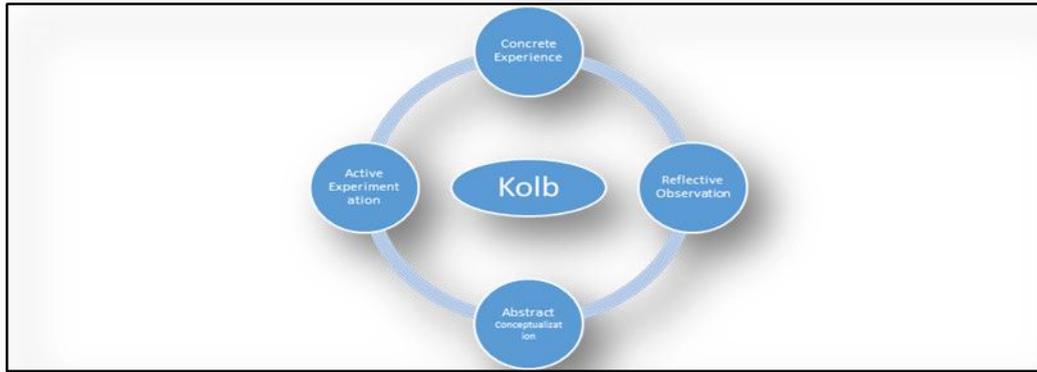


Figure 1: Showing Kolbs experiential learning theory

According to Kolb and Kolb (2008) mention that there are two dimensions defining a holistic learning space where learning take place between individuals and the environment. They further reveal that learning space is multi-level and can describe learning and development in different ways at the level of the individual, the group, and the organization. In this paper learning takes place at the level of individual (learner) and organisation (school). In this paper Kolb experimental learning theory represented in all the stages depicted in Figure 1. These stages are concrete experience where the learners are exposed to extra mural activities on how to proper dispose solid waste. The second level which is reflective observation, is shown in this paper where the learner will review and reflect on the experience. The third level is abstract conceptualisation, that is when a learner concludes and learn from the experience. The last stage is active experimentation, where learners are trying out what they have leant from extra mural activities. The researcher collects data based on all the four stages of experimental learning theory using questionnaires, focus group interview and observations. This paper anchors Kolb and Kolb (2008) believe that to improve learning in education, the primary focus should be on engaging students in a process that best enhances their learning a process that includes effectiveness of their learning efforts thus education must be conceived as a continuing reconstruction of experience. It is not just the result of cognition but involves thinking, feeling, perceiving and behaving as shown in this paper.

## 1.2 METHODOLOGY

This paper on the impact of EE in sustaining land resources from unacceptable solid waste exposure in Mkhondo was based on a qualitative research design. According to Creswell (2007 and 2008) qualitative research is a type of educational research in which the researcher relies on the views of participants, poses different kinds of questions, and collects data consisting mostly of words from participants. Creswell further defines qualitative research as a study that begins with assumptions, a world view, and the possible use of a theoretical lens, and the study of research problems inquiring into the meaning individuals or groups ascribe to a social or human problem. The social problem in this paper is unacceptable solid waste disposal in Mkhondo location.

As a researcher, a qualitative research approach argued well for this study as it allows the description of what has been observed and allowed me to learn more about the impact littering has on the environment and whether the respondents' education about the environment changed their perceptions, attitudes behaviour and knowledge about sustainable environment. Johnson and Christensen (2008) reveal that qualitative research is used when not much is known about a phenomenon and when one wants to discover or learn more about it. In this method respondents are

in turn free to deliberate on their views without being coerced to a particular path. In this way, I was able to communicate personally with the respondents and discovered how they see reality in the real-life situation of Mkhondo habitants.

### **1.2.1 Research Model**

A case study was used as a research model in this paper. According to Creswell (2008), a case study is an in-depth exploration of a bounded system such as an activity, an event, a process, or individuals based on extensive data collection. The researcher locates the case within a larger context such as geographic, political or economic setting of the place. The study of Mkhondo involved the case of Saint Marcia Secondary School where data was sourced from its learners and parents of the learners. De Vos, Strydom, Fouche and Delport (2006) explain that a case study may refer to a process, activity, event, programme or individual or multiple individuals in a community or place. They also point out that exploration and description of a case study takes place through detailed, in-depth data collection methods. Furthermore, Johnson and Christensen (2008) mention that in case study research, the researcher provides a detailed account of one or more cases in the study. Thus this study involved focus group interviews, questionnaires and observation methods of data collection. In this paper I also chose a case because they are also seen as holistic entities that have parts and that act or operate in their environments. Therefore, I chose a secondary school as a case in the study of Mkhondo. Johnson and Christensen (2012) illustrate this type of case as an intrinsic case study, which is popular in education where the goal of the researcher is to describe a phenomenon such as Environmental Education and to evaluate how effectively it is implemented as an extra curriculum activity.

### **1.2.2 Data Collection Methods**

Data was collected using three methods which ensured triangulation where findings of one method will support or reject the outcomes of the other methods. Triangulation is essential in this paper to validate the results and overcome problems the weakness and problems that come from a single method of data collection. The study used a questionnaire, focus group interviews and observations to offset the weakness that can emanate from using a single method.

#### **Questionnaires**

According to Creswell (2008), a questionnaire is a form of survey design that participants in a study complete and return to the researcher. Johnson and Christensen (2011) define a questionnaire as a self-report data collection instrument that each participant complete as part of the study. Moreover, researchers use questionnaires to obtain information about the thoughts, feelings, attitude, beliefs, values, perceptions, personality and behavioural intentions of research participants. As the researcher in this case, I sought to elicit the thoughts, feelings, attitudes, beliefs, values and behaviour of participants through well designed probing questions in the questionnaire.

#### **Qualitative Observations**

Johnson and Christensen (2011:206) also define qualitative observation as “the watching of behavioural patterns of people in certain situations to obtain information about the phenomenon of interest”. They further note that the observer must be unobtrusive so as to not affect what is being observed. It is an important method of collecting data from people because people do not always do what they say they do. This was evident in the study where observation was done without the learners being aware that they were being monitored to ensure that the data is internally valid. I ensured reliability in the study by making use of assistance from two learners in collecting observation data. The learners observed in this study were not aware that the research was in progress to prevent them from changing their behaviour because of being observed.

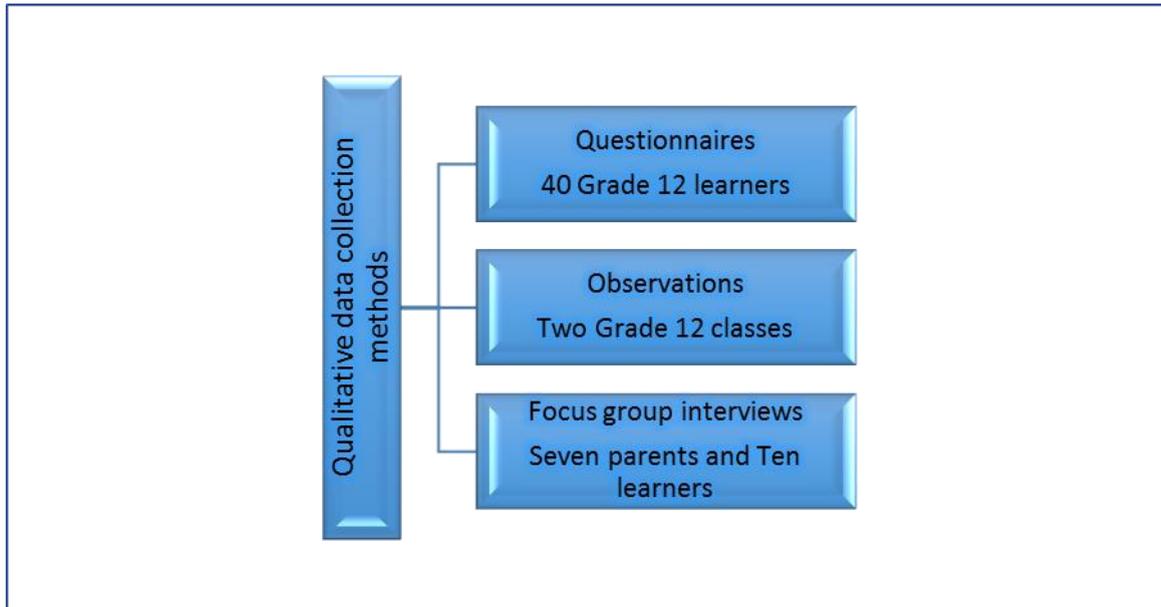
#### **Focus Group Interviews**

Focus group interviews became a strategy for use because open-response questions provided data on how participants made meaning and also as to how individuals conceive their world and explain or make sense of the important events in their lives MacMillan and Schumacher (2010). The main advantage of using focus group interviews are that of direct interaction which allows for a greater depth of information relevant to the topic concerned Ndungu (2004). That stated, I was involved in face-to-face interviews with the focus groups composed of parents and learners respectively. In this study, direct interactions allowed openness and trust among the participants because they were free to voice out their concerns and give advice, where necessary, regarding the study. Through the creation of a social environment in which the group participated, they were stimulated by each other's' perception and ideas, where the researcher can increase the quality and richness of the data through a more efficient strategy than one-on-one interviews (McMillan and Schumacher 2010). Therefore, I was able to witness learners who were at liberty to describe other incidences that related to littering in the school.

### **1.2.3 Sampling Strategy and Data Collection**

The sources of information used by qualitative researchers include individuals, groups, documents, reports, and sites (MacMillan & Schumacher 2010). Purposeful sampling was used so that information-rich participants were sampled for this paper. Qualitative sampling as used in this study, in contrast to probabilistic sampling, is the selection of information-rich cases for study in depth (Patton 2002). Qualitative sampling increases the usage of information sourced from small sample of data. MacMillan and Schumacher (2010) believe that the power and logic of qualitative sampling is that a few cases studied in depth yield many insights about a topic as it was evident in this study where learners revealed the impact of EE as an extra curricula activity.

The target group consisted of forty learners from one of the schools in the Mkhondo location, Two Grade 12 classes and seven parents participated. In their relevance as a sample, they became a significant part of the learning environment where they are taught in an extra-mural activity on how to sustain land resources for future generations. The Saint Marcia Secondary School was chosen from three secondary schools in the location because it was convenient to the researcher. I chose two Grade 12 classes among seven because they fully participated in the extra-mural activities concerning acceptable environment behaviour. Therefore, learners and the parents are likely to contribute to improper solid waste disposal, thus becoming information-rich participants. Ten learners who showed interest and knowledge after being taught EE as an extra-mural activity were selected to participate in focus group interviews. The observations that were done in two Grade 12 classes; the questionnaires were administered to forty Grade 12 learners. Discard as this is a repeat. Parents of Grade 12 learners were also interviewed in a focus group. These were the parents of the learners who participated in the focus group interviews and they were also involved in the extra-mural activities. Only seven out of ten parents invited were able to be interviewed. Figure 2 below illustrates the size of the sample.



**Figure 2: Qualitative data collection method**



**Figure 3: Showing the duration of the three data collecting methods.**

Questionnaire completion for learners took one day, while focus group interviews for both parents and learners took one week and the observations of learners took five weeks as shown on Figure 3 above.

### 1.3 Data Analysis Procedure

As the researcher, I derived meaning from the data by assuming an inductive stance where new meaning emerged from the data collected. I used the data collected from the beginning of the pilot test as well as the information gathered from the literature review to refine the questionnaires. In this paper I outlined the facets to be studied by means of questionnaires in the form of predetermined categories which result in themes that demarcated the ideas to be investigated. The themes enabled the researcher to understand every aspect studied and yielded positive results, which made reporting and interpretation easier. Two key themes then formed the basis for analysis and the interpretation of findings of this paper. In observation, I transcribed the data and analysis followed. Themes were derived from the responses of the focus group interviews that were used in the analysis. The focus group analysis was derived from the interview guide, where transcriptions led to themes. Analysis

involved coding and classifying data with the aim of making meaning of the data collected and to highlight the important messages, features or findings.

## **2.0 FINDINGS AND DISCUSSIONS**

### **2.1 Key Findings**

Learners litter more papers and plastics after break and after school than before break.

Learners were not bothered by the state of the classroom before and after the intervention of EE awareness programmes.

Learners showed no concern about the negative impact towards the disposing of litter inappropriately.

The littering after the extra-mural activities on EE showed that they were not concerned about the environment and that this would result in a ripple effect of similar patterns of behaviour at different homes.

The initiative of EE was implemented to target a short term period hence learners were not acquainted with the responsibility of taking care of the environment and of preventing littering in the school premises.

Of note and of apex to the findings in this paper is that there is a relatively low impact of EE towards reducing unacceptable solid waste disposal at the schools. Therefore, the extra-curricular activities on EE did not impact towards changing the behaviour of the Grade 12 learners who were studied as they continued to litter inappropriately after being taught on how to dispose of litter properly at schools.

### **2.2 Discussions**

The two themes derived were 1) the importance and role of EE and 2) the impact of EE in one of the schools in Mkhondo. This section provides the integration of focus group interviews, questionnaires and observation data presentation as outlined on the data analysis in the following sections.

#### **2.2.1 Theme 1: Importance and Role of Environmental Education.**

The section discusses the importance and role of EE. As a researcher, I chose to impart knowledge that I perceived to be relevant and crucial for the participants before the collection of data began. In the extra curricula activities, I developed a manual to be used by participants to impart knowledge of environmental sustainable behaviour. I anticipated change in their perception and thus my observation was conducted to ascertain the impact of Environmental Education in assisting learners to alleviate improper solid waste disposal in Mkhondo location.

The following categories such as importance of environment to learners and parents, importance of keeping the environment waste free and role that can be played by EE are discussed below:

#### **Importance of Environment to Learners and Parents**

During the focus group interviews, learners and parents deliberated on their perceptions and understandings of the sustainability of land resources from degradation caused by unacceptable solid waste disposal. One learner responded on the importance of environment that, *"It keeps our bodies healthy because we derive food and get oxygen to breathe and in return we breathe out carbon dioxide that is beneficial for plants growth."* This confirmation by learners showed positive ideas on the importance of the environment to the community of Mkhondo. Furthermore, another point that was raised by the learners during the discussion was that the environment acts as a source of income for the community as landmarks could be used as a tourist attraction where people would view with admiration the nature of vegetation, animals, rivers and mountains. Learners responses confirmed the view of Hill et al. (2006) that nature is a provider of natural resources, aspects of the natural environment that are critical to satisfying human needs and wants.

On the same note, one learner further responded to the question about the importance of the environment by saying, *“Environment creates jobs when we use the soil to plant and sell vegetables to the community and also it can create jobs for our parents in forestry and agriculture”*. From this notion, it was evident that the learners were concerned and had pre-understanding of the importance of environment and its benefit to the places they live. Apart from this understanding, they also expressed how the environment could enhance their livelihood in ensuring that natural resources have the necessary capacity to sustaining life. The deliberations of learners in this paper showed that, not only is the environment used as the source where food is grown but it also provides job opportunities for the future generation, such as forestry.

Parents in the focus group interview viewed the environment as having positive impact in their lives in terms of health, jobs, food and protection, as shown in a statement from one of the parents who said, *“I think we also benefit herbs to manufacture medicine from trees, food from plants that grow in the environment and protection from bad weather as we build houses using plant materials.”* The paper also showed that participants believed the importance of keeping the environment clean lies in the reduction in diseases that may be caused by litter disposed in the wrong place. Some participants believed keeping the place clean would reduce spread of germs and pollution. The participants in the paper also revealed that, keeping the environment clean would also save land for important human activities so that future generations could benefit from land resources that have not been degraded by the current generation. The paper also showed that a clean and unpolluted place is safe for children and healthier for the community.

### **Importance of Keeping the Environment Waste Free**

According to learners in the study, the importance of keeping the environment waste free is ensuring sustainable natural resources. Hill et al. (2006) emphasised that the protection of the environment is a lifelong process and the focus should be on current and potential environmental issues that degrade the environment. Furthermore, learners revealed that keeping the environment waste free would prevent the depletion of the ozone layer that may be caused by frequent burning of litter that has been disposed improperly by learners at school and in the places where they spend their time after school hours which is home. *“Keeping our school premises free from litter promotes good health as few flies and diseases will be able to spread because the environment will be clean”*, said one learner when asked about the importance of keeping the environment waste free. Moreover, Fien (1993) emphasises that, understanding ecological and social processes that can serve as the basis for sustainable natural resources, and keeping the environment waste free will also transform the lives and social conditions of learners.

### **Role that Can Be Played by Environmental Education**

Learners revealed that the role of EE in the school is to prevent littering and degradation of natural resources: *“We know EE through the extracurricular activities and its main role is to prevent land degradation and provide awareness in keeping the school clean”*. When asked about promotional and educational campaigns that could help to increase learners’ participation in alleviating dumping of litter in an improper way, the participants responded that billboards could play a role: *“I recommend that billboards can be hoisted in the school where young people will be reminded about keeping the environment clean”*. The comment underscored learner understanding of the role that EE could play an important role in the school and around the area of Mkhondo.

Learners further suggested that signs should be placed on bins and promotions developed by environmental specialists to create community awareness in order to alleviate littering. Learners further highlighted that in order to stop littering, community members should gather and collect papers every week so that the young generation would admire the good work done by their elders in the area. *“We should gather and collect papers having elders as our role models”*, responded one

learner. One parent further suggested *that private companies should initiate and fund environmental clubs in every phase at the school if they are requested to provide assistance. "Teachers should encourage us to keep our environment clean every time they enter the class"*, noted one learner on the role that could be played by education sector in the reduction of littering at the school. Some parents agreed that they also must encourage and play a role to their children to ensure acceptable waste disposal in their homes and that would positively influence their behaviour towards sustainable school environment. While some learners believed that EE during extra-mural activity had played a minor role in the school as some Grade 12 learners understood how to keep the school premises clean, while other learners who had participated in the extra-mural activity on EE were seen discarding their litter at the appropriate place.

## **2.2.2 Theme 2: Impact of Environmental Education**

This section discusses second major theme of the study and the supporting categories, which are namely, disposing of litter and sources of litter, initiatives in reducing littering, and behavioural changes in learners towards littering.

### **Existing Initiatives in Reducing Littering**

This paper showed that EE programmes such as 'stop littering' campaigns were run by the learners in Mkhondo youth centre. Learners revealed that some teachers played an important role towards environment awareness for sustainable natural resources for future generations. However, the challenge for sustainability of our resources is not to justify but to actually help individuals and nations use it to concrete actions and practices (Janse van Rensburg et al. :2002). Furthermore, the paper revealed that there were no environmental societies or organisations in the area practicing or promoting environmental awareness to the community of Mkhondo.

*"Not there, but we have a small group as neighbours to try and clean the place to provide awareness to our children on the importance of a litter-free environment"*, replied one parent when asked about the availability of environmental societies in the area. Parents were concerned about the degradation of land caused by solid waste disposal in the area in such a way that few parents decided to form a group that cleaned their area when rubbish was identified at that particular time. This showed the concern of only very few number of community members. If replicated by other members, their behaviour would result in the eradication of unacceptable solid waste disposal in Mkhondo. The research shows that only municipal employees are seen in the area collecting litter in some areas and it is not happening often as people litter immediately after collection has taken place. This situation is evident at the school investigated in this paper, as learners litter immediately after general workers have just collected litter.

### **Disposing of Litter and Sources of Litter**

The learners revealed that they dispose their litter in different ways such as burning it, throwing litter in open spaces, leaving the litter next to waste containers and disposing litter behind classroom doors. However, some learners proved that extra curriculum activities on Environmental Education had played a minor role in the way that litter was deposited. I also observed them depositing their litter in the few dustbins outside the classrooms. They mentioned that the municipal waste collection truck emptied the only waste container once a week. One of the learners responded: *"At home we make compost with the rubbish that we collect from the kitchen"*. This assertion showed that some learners and parents were making use of the litter in agricultural purposes such as fertilizing crops. They showed signs of proper disposal of litter in a way that would benefit vegetation as a result of the compost that would be derived from garbage and other waste material. Furthermore, one parent elaborated on this theme of impact of Environmental Education as follows: *"We collect bottles and tins for recycling and then reuse plastic bags for future shopping"*. From these participants' responses in this paper, it was evident that some of the learners of Mkhondo were aware of the importance of recycling refuse or acceptable solid waste disposal.

*"I throw away papers and plastics after cleaning the yard at home and we also do not keep a rubbish bin at home"*, replied one learner to the question about how they get rid of litter at home. However, I realised that in this paper analysis showed that some learners were still negligent and ignorant about keeping the environment waste free as they would throw away papers even after the intervention of Environmental Education. Furthermore, the Transportation Research Board (2009) has revealed that littering in society is largely based on perceived social norms. Norms such as people who are more likely to litter in areas that are already littered than in areas that are generally litter free. This is because a littered environment reflects a social norm that littering is tolerated or acceptable, whereas a clean environment reflects a society that is intolerant of littering. In addition, land degradation was not important to some of the Grade 12 learners at that particular time as they continued to dispose of litter on the land and they seemed unaware that their actions presently would have a detrimental effect in the future.

The respondents also mentioned that they threw their litter in the streets where animals such as dogs feed from the rubbish debris. They realised that the arrangement of the municipality to collect the litter once a week influenced more homes to dispose their solid waste materials in the streets. *"We burn all the rubbish we collected during the week,"* noted one learner. The learner was optimistic about what they were doing that it was good thing, unaware that it was an unacceptable practice that would pollute the air. Some parents said that they stored the litter in plastic bags and some community members discarded the litter at street corners when their plastic bags are full. This shows that most of the community members at Mkhondo location are not practicing acceptable solid waste disposal which is detrimental to the entire community health.

In support of the above statement, learners highlighted that the absence of continuous activities in the community on Environmental Education was one of the causes of land degradation. They believed that all learners, not just few individuals, should participate in these environmental activities. This showed that the lack of impact of EE in the study was due to the fact that extra-mural activities were done by only a few Grade 12 learners and not the whole school. Some learners commented that buying regularly from vendors was the cause of litter in schools and believed that vendors should sell food where packaging should be environmental friendly. The participants realised that over the past years there were few shops which sold products that led to solid waste disposals. Thus, fewer bottles were deposited in the land. Learners realised that now most people were able to buy products that ended up in the streets and were not being recycled. As shown by Taylor et al. (2009:30), "these developments are inevitably having negative impact on the countries environment in terms of increased waste production and energy use, and there is a need for effective Environmental Education to help mitigate these problems". Likewise, increase of the amount of waste production has led to more dumping sites in Mkhondo location that are detrimental to the entire community.

### **Behavioural Change in Learners About Litter After Being Taught Environmental Education as an Extra Curriculum Activity**

An analysis of the deliberations of the participants reveals that the category of behavioural change illustrates that Environmental Education received a mixed reception. I discovered that even though few learners acted responsibly in disposing litter at school, their practice still did not adhere to UNESCO's 12 guiding principles of EE, one of which is to "enable learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences. One participant posed a question about the role played by EE and it was responded: *"No change I have seen from my behaviour since being taught Environmental Education at school"*. This response showed a negative impact of EE in extra curricula activity. Another participant argued that there had been *"few changes on my behaviour"*. The contrasting views of the respondents in the interviews showed that some learners were practising what had been taught in school while the majority of learners still ignored the guiding principles of EE that would help them alleviate unacceptable solid waste disposals.

In summarizing the responses above it is evident that most learners' behaviour towards littering had not changed since being taught EE as an extra curricula activity at school.

The interview analysis shows that learners have an important role to play in the society, they must be taught how to dispose of waste properly as that will encourage the youth of Mkhondo to take care of the environment. According to the local newspapers (Excelsior News 2012), the community of Mkhondo in the Richards Bay section of the location were very concerned about the litter disposal container that had not been attended to for years. The newspaper further states that some community members interviewed said that they were complaining about the overflowing skip waste bin that reeked badly as it had not been emptied for a long time. The newspaper illustrated that the foul smell from the bin was affecting the nearby schools, and children would play with the litter after school, which was unhealthy and unhygienic.

Moreover, participants believed that schools could play an important role in reducing littering and land degradation by the formation of EE clubs and providing more dustbins. The respondents proposed that learners who were seen littering should be fined or punished by the school. The paper also revealed that teachers should be responsible for preventing learners from throwing papers on the school premises and they should set a positive example toward acceptable litter disposal. Respondents further noted that recycling in schools is essential at reducing litter. Hence, the surrounding schools should facilitate recycling measures and involve all stakeholders in environmental programmes. Likewise, programmes on EE should be facilitated repeatedly to woo more learners and teachers in order to advocate natural resource sustainability in the area. This paper clearly shows that the negative impacts of EE outweighs the positive influence in the manner learners dispose solid waste in the different school premises as well as in the community at large. The impact of EE as an extra-curricular initiative has a negative effect with regard to the way learners preserve land resources from degradation caused by unacceptable solid waste disposal.

### **3.0 CONCLUSION**

The study on the impact of EE at one of the schools in Mkhondo was a success in that as a researcher was able to achieve the formulated aims and objectives. The findings indicate that although learners were taught and made aware of the extent of degradation caused by unacceptable solid waste disposal, positive attitudes and behavioural change towards littering were minimal. The results showed that learners responded negatively to EE and consequently littering continues to prevail in the schools. This can be attributed by that only two classes were sampled and exposed to the vigorous initiative of EE as an extra-curricular activity.

### **4.0 RECOMMENDATIONS**

The findings of this paper have resulted in the formulation of recommendations that have been suggested to the alleviation of unacceptable solid waste disposal that has a negative impact on the schools and subsequently the places where learners live.

Schools should set aside some days for clean-up campaigns to create learner awareness and help in alleviating littering inside classes and in the school surroundings. For an example, the campaigns should be based in the school and learners should lead the initiatives.

The programmes of the schools on environment should be annually reviewed so that learners who complete Grade 12 and were serving in the environmental committees are replaced.

It is evident from the findings of this study that it is worthwhile for the people of Mkhondo to advocate for litter-free environment campaigns with the help of the local government and the spheres of education.

EE should be a continuous programme that the schools adopt in order to prevent learners from forgetting the importance of the environment and it should be accessible to all learners regardless of their phase at the school.

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