

Reconnoitering the Stimulus of Environmental Education in Reducing Improper Solid Waste Disposal: A Case of St Marcia School in the Mkhondo Village in Mpumalanga in South Africa

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ABSTRACT The paper reports on the exploration of Environmental Education as a stimulus in sustaining land resources which can be degraded by improper solid waste disposal. It is an empirical qualitative case study wherein data was collected through focused group interviews of learners, guided questionnaires for learners and observations of learners in and out of the classroom. The objective of the present paper is to establish whether what has been taught in extra-mural activities about Environmental Education is being practised by learners in the school. A typology approach was used while analysing data and the results displayed that learners continued to litter even after participation in Environmental Education as an extra mural activities. There was relatively low response to change in the way the learners litter at school premises. The extra mural activity aroused initiatives to reduce littering although the impact was minimal in eradicating unacceptable solid waste disposal in the school. It is, therefore, suggested that more emphasis than before should be put on the integration of pragmatic Environmental Education intervention in all subjects so that most learners would realise the importance of acceptable waste disposal.

INTRODUCTION

Mkhondo Township has a challenge with a growing trend of unacceptable waste disposal resulting in land being filthy, caused by community littering substances such as plastics, empty bottles, papers and other residues harmful to people and animals. Litter, raw sewage polluting rivers and dams, destruction of forest and plant material, and air pollution are just some examples of people's actions on their environment (Singh 2014). However, Jorgenson and Givens (2014) explain that environmental concern is a higher order need that societies attend to once their material needs are met. Further, they indicate that meeting basic needs is increasingly possible with the rise of development and welfare, thus higher levels of environmental concerns are associated with higher levels of economic development affluence. In fact, the centralised and bureaucratic forms of governments

used their democratic powers to salvage environmental protection operations between the unequal power distribution favoured business interests to get the maximum value out of the environment (Chandra 2014).

In schools a lot of waste is generated through littering which degrades the environment. This is against the National and Environmental Act, Biodiversity Act and Water Act 10 of 2004 of South Africa. Responding to such calls, the paper provides a guide on what influence does Environmental Education wield in sustaining land resources from unacceptable refuse dumping which affect the school environment? The research on the influence of Environmental Education as an extra mural activity should provide an important foundation for keeping the environment clean and a platform for learners to be responsible, innovative and play a role as they interact with the environment. Loubser (2007: 43) voiced that, "since 1992 the field of Environmental Education has been widely influenced by the notion of sustainable development, with educators advocating that Environmental Education should be focused primarily on achieving the goals of sustainable education". In fact, harmful human activities such as unacceptable solid waste disposal in *Mkhondo* can be alleviated by introducing Environmental

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Education as an extracurricular activity on a sustainable basis.

Environmental Education is vital in reducing unacceptable solid waste disposal. Mohammad (2014) commented that it is scientifically proven that the importance of environment of our life is very important and we can not live and be compared with the value of money. It has significant value to the development issues and may lead to sustainability for the generations in future.

Environmental Education has evolved swiftly since the years of war such as the inevitable Second World War that emerged between 1939 and 1945 exemplified by the number of international conferences and workshops which were held on environment and sustainability of land resource. Loubser (2007: 39) believed that "the war led to its unprecedented devastation and human suffering, which culminated to an important period of new ideas and plan for the better world". Human activities that were detrimental to environmental sustainability led to campaigns such as conferences including the Rio De Janeiro Earth Summit in 1992 and the World Summit on Sustainable Development which was held in Johannesburg, South Africa in 2002. This was evidenced by the 1972 Stockholm a meeting for developing Environmental Education that was held in support of preserving natural resources regardless of whether the country was poor or rich. The meeting led to the realisation of Environmental Education.

Further, Loubser (2007: 43) stated that, "Since 1992 the field of Environmental Education has been widely influenced by the notion of sustainable development, with educators advocating that Environmental Education should be focused primarily on achieving the goals of sustainable education". In fact, human activities such as unacceptable solid waste disposal in *Mkhondo* can be alleviated by infusing Environmental Education as an extra curriculum activity on sustainable basis. During the past years there has been an increasing comprehension of how the environmental challenges have a multi-dimensional effect on education. This effect needs to be addressed by the teachers of today through specific training to render them fully equipped to carry out environmental education, increase expertise and ensuring sustainability (Makkaki 2014). Yet high consumption lifestyle in the village has major effects on how much domestic waste is produced by modern technology. In addition, little effort is made to bring the

same technology to reduce unacceptable waste disposal (Kamara 2006).

Mkhondo Solid Waste Report (2010) informs that the increasing population in the area under study *Mkhondo* and growing prosperity of the present development patterns will further stress the environment. In fact, resources of support sustainability in higher education tend to focus on projects rather than on how change happens and by whom (North and Jansen 2013). Communities have a better life such that they afford to buy lot of materials that lead to unacceptable solid waste disposal which causes land degradation. Environmental Education can play an important role in a sustainable basis to reduce the impact of unacceptable solid waste disposal. The unacceptable behaviour is also evident in the school environment. Debate on the efficacy of environmental education and the relative importance of school and non school settings increasingly acknowledge that extra mural activities are significant catalyst that promote a deeper and more inclusive awareness of the environment and the interrelationship between humans and their biophysical surroundings (Binoy and Kurup 2014).

METHODOLOGY

The researchers chose a qualitative research approach. Johnson and Christensen (2008) indicate that qualitative research is used when little is known about a topic or phenomenon and when one wants to discover or learn more about it. In this way, the researchers were able to communicate personally with the respondents and to discover how they see reality in the real-life situation of *Mkhondo* village. In fact, the paper is an empirical interpretivist qualitative case study. It was conducted in the Republic of South Africa in one of the nine provinces namely *Mpumalanga*. One school was chosen with the focus on Grade twelve learners. The Saint Marcia Secondary School is situated at the heart of *Mkhondo* location. It has learners from Grade eight to Grade twelve who are residents of the area. The medium of instruction is English. The school comprises approximately 1600 learners who speak Isizulu as their home language.

The sources of information used by qualitative researchers include individuals, groups, documents, reports, and sites (MacMillan and Schumacher 2010). Purposeful sampling was used for the present paper so that information-

rich participants were sampled. Qualitative sampling as used in the study, in contrast to probabilistic sampling, is the selection of information-rich cases for paper in depth (Patton 2002). Qualitative sampling increases the utility of information obtained from small samples. MacMillan and Schumacher (2010) believe that the power and logic of qualitative sampling is that a few cases studied in depth yielding many insights about a topic as it was evident in the paper.

The target group comprised of forty learners from one of the schools, two Grade twelve classes and seven parents. The researchers chose learners because they form an integral part of the learning environment where they are taught in 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 easily accessible by the researchers.

The learners and the parents are likely to contribute to improper solid waste disposal, thus, becoming information-rich participants. Ten learners who posed interest and knowledge after being taught Environmental Education as an extra-mural activity were selected to participate in focus group interviews. The observations were done in two Grade twelve classes; the questionnaires were administered to forty Grade twelve learners whilst ten learners participated in the focus group interviews. The learners became information-rich participants.

Most of the activities on the prepared manual focused on making learners aware of the illnesses of littering of solid waste. Some of the activities focused on the proposals on how to get rid of solid waste and any waste in general. They went through the activities during the extra mural activities period. Learners were observed on how they took care of litter and solid waste in particular; before they went through the extra mural activity they also completed questionnaires. After the extra mural activities learners were purposefully selected. The criterion was an interest in Environmental Education after going through the extra mural activities were selected to participate in the focus group interviews.

RESULTS

Importance of Environment to Learners

This section addresses the importance and influence of Environmental Education on learn-

ers during extra mural activities. After learners were taught the importance of Environmental Education as an extra mural activity, data collection was done. One learner indicated that the importance of environment was 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 to plants."

This assertion showed that learners have positive ideas on the importance of the environment. Another point raised by the learners during the discussion was that the environment acts as a source of income for the community as it could be used as a tourist attraction where people would view with admiration the nature of vegetation, animals, rivers and mountains. Learners 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.

One of the learners 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".

The response stood evidential that the learners were concerned and had prior understanding of the importance of the environment and its benefit to the places they came from. Apart from this understanding, they also expressed how the environment could enhance their livelihood if it were conducive to sustaining life. Not only the environment used as the source where food is grown but it also provides job opportunities for the future, such as the example of forestry provided by learners.

"Future generations such as learners have to benefit from the very same environment", replied one participant in supporting the importance of the environment. The participants understood the negative impact in future if the environment was not kept in a proper manner. Further, nature was viewed as a provider of natural resources, aspects of the natural environment that are critical to satisfying human needs and wants, as explained Hill et al. (2006). At this particular stage of the interview learners understood the importance of the environment and the land that we live on. They emphasised that without taking care of the current situation in terms of

conserving our environment, the future generations would find it difficult to sustain their lives. They demonstrated awareness of the significance of the environment. This instance is supported by the White Paper on Environmental Education that supports taking care of the environment for future usages (White Paper 2000).

The researchers believe that the response of participants to the importance of the environment was vital in determining how environmental knowledge influences their decisions about solid waste disposal in *Mkhondo*. The belief was guided by the positive response displayed by learners as the aim outlined for the paper was met. The responses showed that learners interacted with the environment and they value the environment as essential and understood that it has to be protected for future generations.

Participants viewed the environment as having a positive impact in their lives in terms of health, jobs, food and protection, as brought forward in a statement from one of the learners who said, *"I think we benefit 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 informs 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 germs and pollution. Keeping the environment clean would also save space for important human activities so that future generations could benefit from land resources that have not been degraded. The research also connotes that a clean place is safe for children and healthier for the community. As Marcinkowski (2010) explains, environmental conditions and problems we face require our diligence in understanding and shaping policy, theory, research, curriculum, teaching and learning, and assessment and evaluation into more coherent and holistic plans.

Importance of Keeping the Environment Waste Free

According to learners in the study, the importance of keeping the environment waste free is that of 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 situations. The learners further revealed that keeping the environment waste free would prevent the depletion of the ozone layer that may be caused by frequent burning of litter disposed improperly by learners at school and in the places where they spend their time after school hours.

"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. As Fien (1993) emphasise, 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.

Disposing of Litter and Sources of Litter

The learners revealed that they disposed their litter in different ways such as burning it, throwing litter in open spaces, and leaving the litter next to waste containers. However, some learners advocated that Environmental Education as an extra mural activity has played a minor role in the way that litter was deposited. It was observed that they deposit their litter in the few dustbins outside the classrooms.

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 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. Furthermore, one parent elaborated on this theme as follows: *"We collect bottles and tins for recycling and then reuse plastic bags for future shopping"*. From these participants' responses in the paper, it is evident that some of the learners of *Mkhondo* were aware of the importance of recycling refuse. They sold bottles for monetary rewards and that reduced the spread to dumping zones in the area. The idea of reusing plastic bags while shopping represented that the community was practicing green shopping. This idea could reduce unacceptable solid waste disposal if the majority of the community households could adopt the practice through learners' involvement.

"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. The researchers realised that the paper manifested 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. Further, the Transportation Research Board (2009) revealed that littering in society is largely based on perceived social norms. People 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, whereas a clean environment reflects a society that is intolerant of littering. Land degradation was not important to some of the Grade twelve learners at that particular time as they continued to dispose of litter on the land and they seemed unaware that their actions now would have a detrimental effect in the future.

Sitarz (1994) notes that in the past the earth's seemingly unlimited supply of natural resources and its ability to assimilate waste were taken for granted. Consequently, the enormous increase in human numbers and activities in this century has placed profound stress on these capabilities. In the paper, learners believed that the current generation produced more litter than our predecessors because of high population numbers, and degradation was caused by a lack of discipline in schools where learners were not punished for deliberately throwing papers in the classroom and corridors. As one learner noted, "Proper policies should be implemented for the school so that perpetrators are punished for littering on the school premises". That showed signs of the lack of behavioural change even though the learners understand the importance of Environmental Education, as learners were unable to prevent unacceptable littering at the school and subsequently in Mkhondo area.

Hill et al. (2006: 93) adds to the discussion that the nature is also viewed as a fragile natural resource that can be overexploited and degraded, jeopardizing human existence, and the learners had the same view. Likewise, some of the respondents identified a lack of respect and negligence as the forces driving learners to dispose of waste unacceptably. Further, a participant in the paper pointed out that food items bought by

learners were in plastic bags and that was the reason learners littered on the school premises. The research revealed that economic advantage is also a cause for land degradation as most learners were able to buy food in paper and plastic bags that later littered the environment.

Learners highlighted that the absence of continuous activities on Environmental Education was one of the causes of land degradation in the community. They believed that all learners, not just a few individuals, should participate in these activities. This showed that the lack of impact of Environmental Education in the paper was due to the fact that extra-mural activities were done by only a few Grade twelve learners and not the whole school. Some learners revealed that buying regularly from vendors was the cause of litter 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 that sold products leading to solid waste disposal. 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*."

When asked who was responsible for generating waste, the learners responded by saying that at school they were the main culprits of littering and in the community, children, parents and the general public played a role in land degradation. Some believed that shops and vendors were responsible for generating waste in the community. The type of litter evident in the school is plastics, papers, and fruit peels. In the community, tins, papers, plastics, torn clothes and disposable nappies cause the environment to be untidy and degrade the land, making it unsuitable for future generations.

"As learners we litter papers and plastics because we do not care", mentioned one learner during the study. From this acceptance, it was clear that learners believed that they littered papers, plastics, and other waste material due to negligence. The paper showed that most learn-

ers always littered in the school and in the surrounding community and few rarely littered in the environment. In fact, protection of the global resources of land, fresh water, biological and genetic resources and energy must be paramount (Sitarz 1994).

DISCUSSION

An analysis of the deliberations of the participants reveals that the category of behavioural change illustrates that Environmental Education received a mixed reception. The researchers discovered that even though few learners acted responsibly in disposing of litter at school, their practice still did not adhere to UNESCO's 12 guiding principles of Environmental Education, 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". Likewise Jorgenson and Givens (2014) believed that socio-economic status, level of education and individual-level exposure to degradation are all commonly found to increase the likelihood of environmental concern.

Lambert et al. (1995) voiced that schools and organisations change as participants make sense of their work and find challenges and possibilities together. One of the chief myths about change is that it comes from a felt need, a discomfort, and an unbearable pressure that forces us to change. As the paper by Pedretti and Nazir (2014) highlighted that participants view outdoor education as an intrinsic component of environmental education necessary for connecting learners to the environment and helping them understand the role of nature in their lives. Research findings indicate that students are likely to begin to understand the natural world if they work directly with their natural phenomena, using their senses to observe (Makkaki 2014)

Within communities that foster human growth and development, change seems to be a natural result of constructing meaning and knowledge together. The paper of *Mkhondo* supported Lambert's idea: the community's growth towards the alleviation of littering was a result of constructive meaning making and knowledge. From their responses, the learners' decisions ignite that education played a minor role in shaping their way of caring for the environment by making good decisions that would have favourable rewards. However, Binoy and Kurup (2014), emphasised that experimental En-

vironmental Education activities such as participating in outdoor programs are meaningful ways of engagement that not only improve the learner's environmental literacy but also positively impacts pro-environmental motivations and behaviour at the individual level

One participant, when asked about the role played by Environmental Education, responded: "No change, I have seen from my behaviour since being taught Environmental Education at school." This response showed a negative impact of Environmental Education. As the study conducted by Pedretti and Nazir (2014) noted that most teachers observed and interviewed do not care very much about environment as they are not role models to the learners where they are seen timely throwing can in the bin and not taking recycling into consideration.

Another participant argued that there had been "few changes on my behaviour". The contrasting views of the respondents in the interviews brought out that some learners were practising what had been taught in school while the majority of learners still ignored the guiding principles of Environmental Education that would help them alleviate improper solid waste disposal. Most learners' behaviour towards littering had not changed since being taught Environmental Education.

The interviews showed that young children were mostly affected by improper solid waste disposal as they were vulnerable, attracted to playing with the litter, and thus contracted diseases and injuries. The interview analysis informed 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 newspaper *Excelsior News* (2012), the community of *Mkhondo* in the *Richards Bay* section were very concerned about the rubbish 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 primary school, and children would play with the litter after school, which was unhealthy and unhygienic.

The research showed the opposite of unacceptable solid waste disposal, some learners were aware of the dangers of littering and they disposed of their litter in a proper way. The study

also found that more environment lessons could be beneficial to eradicate littering in the area. The participants believed that waste containers should not be placed far away from the classes and should be increased in the school. The participants believed that a lack of knowledge about the environment, more shops, a shortage of dustbins and overpopulation were the main driving causes of land degradation in the area. According to the participants, more people with buying power resulted in more people littering in the area. The study also showed that in the first week immediately after break some learners were seen throwing papers on the floor and not disposing of the litter properly. The situation was similar for the second week and changes were seen in the last week of observations. The evidence of papers in the classroom was dominant after school.

The Transportation Research Board (2009) compared the need for an information campaign on littering and pollution in the period 1960 to 1980 versus the needs of today. They noted that although the campaigns in the earlier period were directed at educating people about littering and raising awareness, today's campaigns must focus on behaviour and attitude change. The paper presents that learners' behaviour towards litter since being taught Environmental Education had not changed; they continued to litter papers at school even after being taught proper solid waste disposal procedures. Others sought clarity and even posed questions to parents about disposing of garbage in a proper way and place. The behaviour of some learners exhibited at home showed a positive response to Environmental Education, even though these learners were in the minority. Thomas-Hope (1998: 15) "believes that in local townships the problem of careless waste disposal is often caused by the lack of awareness of the dangers of health presented by the accumulation of refuse".

The paper further brings out that more learners disposed litter more often after buying their food during break time. The amount of litter is doubled when comparing the data collected in the morning to that collected immediately after school. In the three consecutive weeks observations carried out in two classes varied in results. The researchers believe that the variation in the last week may have been caused by the intervention of Environmental Education as an extra-curricular activity. Balderjahn (1998) pointed out in his research and appeared to be quite

environmental conscious, but most of learners are simply paying lip service.

CONCLUSION

The researchers concluded that if there were no learners throwing litter on the floor in the form of papers, plastics, papers from sweets and fruit peels, few learners would be littering. Actions of individual learners influence others, as argued by social cognitive theory. The study showed that some Grade twelve learners grasped minimal knowledge about Environmental Education at school. Evidence of change was not seen in most learners as they were not taking responsibility of garbage at the school. The focus group for learners' deliberations revealed that the overall impression of the impact of Environmental Education in *Mkhondo* was also minimal.

The St Marcia Secondary School in *Mkhondo* does not have adequate waste containers and the only one has not been emptied for some months. The participants believed ignorance played an important role in degrading the land through improper solid waste disposal. The learners agreed that they discarded papers anywhere in the schoolyard and that behaviour was also exhibited at home during weekends and after school. The above reasons show that the community of *Mkhondo* lack knowledge about Environmental Education have a negative attitude towards the sustainability of natural resources, and exhibit unacceptable behaviour towards natural resources. The overall finding of this paper was that there was a relatively low influence of Environmental Education in reducing unacceptable solid waste disposal at the school; hence the extra-mural activities on Environmental Education did not drastically change the behaviour of the Grade twelve learners who were studied as they continued to litter inappropriately after being taught on how to dispose of litter properly at school.

RECOMMENDATIONS

The findings of the paper have resulted in the formulation of the following recommendations that have been suggested in alleviation of unacceptable littering that has a negative impact on the school and subsequently the places where learners live.

Training of Stakeholders

Educators should be trained on Environmental Education and reminded about the importance of keeping the learning environment free from litter that may result in land degradation. Further, educators will then cascade the information to learners as they are the role models of the younger generation. Manuals on Environmental Education should be developed so that every person has a common idea on how the environment should be sustained for future generations.

Avoiding, Reducing and Separation of Waste at School

More waste bins should be made available in all classes instead of the small buckets that are unable to carry the amount of litter the learners dispose of inside the classrooms. REDUCE, REUSE AND RECYCLE, so learners and educators should use the 3 Rs as one of the initiatives to combat littering in the school and in their homes.

School and Community Awareness Programmes

The school should set aside some days for clean-up campaigns to create learners' awareness and help in alleviating littering inside classes and in the school surroundings. Besides, the campaigns should be based in the school and learners should lead the initiatives. The programs of the schools on the environment should be annually reviewed so that learners who complete Grade twelve and serve 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. There is also a need for further research on why learners did not change.

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