



THE IMPACT OF ENVIRONMENTAL EDUCATION ON THE ENVIRONMENTAL PERCEPTIONS/ATTITUDES OF STUDENTS IN SELECTED SECONDARY SCHOOLS OF BOTSWANA

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Abstract:

The study investigated the impact of Environmental Education (EE) on the perceptions and attitudes of secondary school students concerning environmental sustainability in selected schools in Botswana. The objectives were set to: i) investigate the teaching of EE in secondary schools; ii) examine the perceptions and attitudes of EE students towards environmental sustainability. A qualitative research design guided data collection where interview protocols, observation schedules, and document analysis were employed for the gathering of data. The main research findings were that EE is indeed integrated in teaching subjects at secondary school level in Botswana. The teaching of EE is fundamentally teacher-centered resulting mainly in enriching students' knowledge about the environment without really providing them with the capacity to act for environmental sustainability. Subsequently, the teaching of EE in the studied schools has failed to transform the perceptions and attitudes of students towards responsible and action oriented environmental stewardship.

Keywords: perceptions, environmental education, sustainability, conservation

1. Introduction

According to the Botswana Government (1994), it is mandatory that environmental Education should be taught in all secondary schools in Botswana. This is in direct response to the need of combating the degradation of the environment that is a consequence of developmental needs and growing population of Botswana that have imposed massive pressure on environmental resources (Silo, 2015; Botswana Government, 1994). It is, therefore, expected that EE should transmit knowledge, skills

and values particularly to the younger generation of the society and also to empower them to adopt a protective attitude when utilizing environmental resources (Athlpheng, 1998). Essentially, it is aimed that EE builds personal commitment to conservation, and action that facilitate changes in values and ethics to promote environmental sustainability (Sundar, 2010).

Purpose of the study

The study investigated the impact of EE on the perceptions and attitudes of the secondary school students in relation to the sustainability of the environment.

Objectives of the study

The objectives of the study were to:

- a) investigate the teaching of EE at secondary school level; and
- b) examine the perceptions and attitudes of EE students towards environmental sustainability.

Perspectives from Literature

Meaning of Environmental Education

According to Athlpheng et al. (1998), EE is an education that seeks to inculcate positive attitudes, instill discipline, and encourage responsibility in people's interactions with the environment. It is the learning process that increases people's knowledge and awareness about the environment and its associated challenges, develops the necessary skills to address environmental challenges and fosters attitudes, motivations and commitments to make informed decisions and take responsible actions towards the environment (UNESCO-UNEP, 1978). Therefore, EE is concerned with ensuring that people understand the usefulness of the environment, its challenges and what can be done to conserve it. It is also meant for learners to change environmental behaviors and formulate positive code of behaviors and attitudes in such manner that they relate to the environment in a sustainable manner.

Reasons for Environmental Education in Botswana

The developmental needs and growing population of Botswana have put much pressure on environmental resources such that more often than not this has resulted in mismanagement of resources. Moreover, the National Conservation Strategy Agency

(1994) identified littering, indiscriminate dumping and stockpiling of waste as being serious pollution problem in and around settlements in the country. Correspondingly, Ifegbesan (2008) also notes that the greatest challenges facing developing countries are unhealthy disposal of waste. Silo (2015) further singles secondary schools in Botswana as grappling with waste, sanitation management, together with water and electricity management. In fact, Atlhopheng et al. (1998) add that Botswana has limited water resources which have both temporal and spatial variations, thus, conservation is needed to utilize water without depleting it. This situation may incapacitate the environment to sustain the needs of the future generation hence the need for EE.

Regarding the foregoing outlook of the environment, Atlhopheng et al. (1998) say that EE in Botswana aims is to give learners knowledge, and skills to view the environment as a resource that should be utilized sustainably in meeting their needs. It should also identify and alter accepted norms and values which are potentially destructive to the environment. Besides, Botswana has also adopted the UNESCO EE objectives in its education system. The implication is that the education system targets at creating environmental awareness, developing knowledge of the environment, fostering attitudes and values that ensure environmental responsibility, developing skills for identifying and solving environmental problems, and bring about active participation among students in environmental improvement (UNESCO, 1997). Similarly, Sundar (2010) advances that the objectives of EE focuses on values and ethics that build personal commitment to conservation and on action that facilitate changes in behavior to promote sustainable development as a new mode of living.

Environmental Perceptions

The present study views environmental perceptions as the ways students see the environment, their immediate understanding, recognition and appreciation of the environment (Palmer, 1998). In short, environmental perceptions and attitudes are about how individuals think or view the environment. Perceptions of the environment triggers an attitude attitudes individuals hold about the environment which will often be evidenced by actions they display (Palmer, 2003). If an individual sees the environment as an asset, they will manage it in such a way that it is sustainable. Therefore, student's environmental perceptions are judged from their conscious and voluntary participation in environmental conservation activities.

In relating knowledge and pro-environmental behavior, Kollmus (2002) found that there was no apparent relationship between them. He discovered that education results in more knowledge about environmental issues but that education does not necessarily translate to pro-environmental behavior. Thus, knowledge about

environmental issues alone does not initiate change in the behavior of an individual as change is brought by both internal (priorities, motivation) and external factors (school policies, cultural practices). Afegbesan (2008) concurs with Kollmus (2002) that environmental knowledge is not linked to pro-environmental behavior. Equally, Adeolu, Enesi and Adeolu (2014) note that there is fewer links between the content knowledge of the curriculum and its practice.

Contrary, Jensen (2006) believes that knowledge is an important condition for the development of competence leading to action and behavioral adjustments in relation to the environment. He, however, argues that dynamics such as the teaching of EE not being action oriented or just concentrating on passing knowledge to the students and not affording them the chance to be actively appropriate and internalize that knowledge impede knowledge from leading to behavioral change. He asserts that schools cannot assume to be environmentally effective simply by routine cleaning, sorting waste, recycling and engaging students in litter campaigns. Likewise, Ketlhoilwe (2007) did not find much connection about how these tasks improve environmental attitudes and perceptions. He contends that students basically see routine cleaning, litter picking and waste sorting as hard labor and not as a learning activity. Essentially, effective learning should result in a positive perception of the environment which should yield good environmental management practices. The next section suggests the teaching approaches and learning activities which can help improve students' perceptions of the environment.

Teaching/Learning Strategies necessary for influencing learner's perceptions

According to the UNESCO (1997), the EE curricular and pedagogical practices necessary to achieve its environmental sustainability should emphasis on learners working individually and collectively towards resolution of current environmental problems. In this regard, students should be actively involved at all levels in working towards resolution of environmental issues. Also, teaching and learning should be a cooperative process of inquiry into and action on real environment issues. This demands that students be actively engaged in critical thinking and flexibility in pedagogical planning (Stevenson, 2007). Sundar (2010) advocates for EE to be taught in such a way that it teaches compassion, respect for beings and non-living beings, whole systems thinking, suitable living practices and critical reflection. He explains that EE requires a holistic and preferably interdisciplinary approach to teaching with opportunities for diverse learning, experiences and particular emphasis on direct experiential learning. Furthermore, Stevenson (2007) argues that for EE to be effective students should be exposed to the plurality of environmental ideologies and through

the process of inquiry, critique and reflection they can be aided to develop and defend their own set of environmental beliefs and values. After engaging in these rational process and moral deliberations, it would be each student's choice to pursue actions they deem necessary and justifiable for achieving environmental reform.

In addition, Adeolu et al. (2014) advice that to develop connections in EE there is need to use varied strategies meant to integrate individual's knowledge, attitudes and behavior. As such action based approach which involves interdisciplinary connection between the environment, people, culture and society, and environmental clubs should be employed (Silo 2015; Jensen, 2002). Ndaruga (2013) suggests that use of role modelling, direct experience, collaborative group discussions aid environmental attitude change and help conceptualization of environmental sustainability issues. Thus, a more hands-on approach is the key to foster attitudes that would aid environmental sustainability among the students.

Sadly, Stevenson (2007) laments that majority of our classroom teaching of EE emphasizes on the mastery of many fragmented facts and the pedagogical process involves the teacher as the dispenser of factual knowledge. Equally, Sundar (2010) notes that many EE programs in schools mainly centers on developing awareness and knowledge without taking the learner through to the ultimate objectives of building personal commitment to act for the environment in order to engineer the sustainability of environmental resources.

Methodology

The study involved five conveniently selected secondary schools in Gaborone with an assumption that they taught EE as mandated by the (RNP, 1994). From each school, four students, two teachers and a head of department were also conveniently chosen. Data was gathered through interviews and observation of environmental practices in the study sites. Data analysis was done manually as to arrive at themes that ultimately turned out to be the main findings of the study.

Results and Discussion

In order to investigate the impact of EE on the perceptions of students towards the environment, the study had to firstly establish if indeed EE is being infused in the selected secondary schools in Botswana. The results of this investigation follows below.

Teacher's views on infusion of EE in the teaching

The question to teachers on whether they infused EE in their lessons yielded the following responses:

Teacher 1: *"Yes I do, there are some topics that addresses environmental issues such as land as a factor of production and how entrepreneurs can use land more sustainably in Commerce."*

Teacher 2: *"Yes, we do infuse especially when teaching a topic which can link to the environment."*

Teacher 3: *"With us it's like our syllabus is more of man and his environment, hence, issues of the environment are more of our mandate."*

Teacher 4: *"Sort of, though not sufficiently, we are just doing it although I feel it should not be compulsory to us."*

Teacher 5: *"Oh yes, my subject has topics on water and electricity bills, rates of pollution, resource use which includes budgeting and others. So you can see EE is all over my subject."*

Teacher 6: *"It's difficult for me to categorically tell, I am not too sure of what comprises EE. Well, debates and compositions on pollution, gender issues, democracy and others are part of what is done in my English."*

Head of Department: *"Yes, they do, during observations we do come across teachers teaching topics on the environment especially in social studies teachers and geography."*

From the results above, one can safely argue that all respondents affirm that indeed EE is infused secondary school lessons. Moreover, apart from the subject teachers confirming that EE was infused in their teaching, all heads of department through their routine monitoring of teaching found that certainly EE was present in lessons. In fact, further investigation by this author through lesson observations, in lesson plan booklets and scheme of work showed presence of environmental issues. However, there were a few who did not appreciate the presence of environmental issues in their curriculum as they felt that this should not have been part of their mandate. They were of a view that EE belonged to subjects that were more scientific in nature (natural sciences). Such teachers felt they merely taught environmental related topics because of syllabus expectations and for the sake of students passing the final examination.

The sentiments of some educators raised above do not seem to show that there is a deliberate effort by them to have EE taught in their subjects. Apparently, some teachers are simply doing it under duress because it is integrated in their subject content. For example, the response given by teacher 4 above simply confirms this argument in that the teacher felt matters of the environment should not have been part

of their teaching mandate. This attitude leads this author to speculate that some sectors of teachers merely teach environmental issues to meet the requirements of their syllabus and not to bring about attitudinal transformation regarding the environment among learners.

Participation in Environmental Clubs and Days

Furthermore, respondents were required to state how else, apart from infusion, the schools were inculcating EE among the learners. In line with this, specific questions were asked concerning the existence of an environmental club in the school and participation in environmental days.

Teacher 1: *"We used to have an environmental club though it was just a structure. Also, it is sad to inform you that we don't really celebrate environmental days in this school."*

Teacher 2: *"Ours is more limited to lessons, we don't have EE club which in most cases used to drive EE issues more practically and neither do we celebrate any environmental related day".*

Teacher 3 giggles and says: *"I have never heard of such club since I got into this school. As for environmental days, I just here on T.V that there was water day, environmental day, and all other, day, day things!"*

Teacher 4: *"It used to be there and there was no support from both management and staff. It is like teachers clubs them as competing with academics. Celebrating environmental days has not been in the vocabulary of this school."*

Head of Department 1: *"Unfortunately, we don't have an active club, thus, other environmental issues like celebrating world's environmental day we never even think of them as we don't have anyone coordinating such activities. Teachers are unwilling to volunteer to coordinate the club."*

Head of Department 2: *"I can't remember having an environmental club in this school. Of course, the Ministry of Education Officers, in charge of environmental affairs have stressed the need of environmental clubs over and again, but teachers are not willing to spearhead this due to other academic engagements."*

The sentiments from teachers simply show that there were no environmental clubs to stimulate action about environmental matters in the school. This lack of the clubs is basically blamed on the lack of interest by the teachers and lack of support from the school administration. It is also a view of other teachers that the club was unnecessary as it competed against academics that were the core business on which even assessment of teacher performance was based. This lack of environmental clubs was reported to be impacting negatively on the participation of schools in

environmental activities and days. This is because clubs were thought of as being important at providing leadership to participate in environmental activities and world environmental days.

Similarly, the schools did not have environmental policies. When asked about the policy, teachers sounded ignorant of its existence. The school management, though, indicate that they were aware of the existence of the existence environmental policy as published by the Ministry of Education but they had not made any effort to localize it in their institutions. This is a significant gap regarding implementation of EE on school grounds and over environmental resources. This is because, as Ketlhoilwe (2010) and Ndaruga (2013) contends, environmental policies are important yard sticks on the evaluation of the success of EE when measured against reflection of EE in school grounds and use of environmental resources. Subsequently, it could be reasoned that schools simply undertake environmental related activities such as litter picking, greening the schools, and daily routines of cleaning the environment randomly and haphazardly as there was no environmental policy to guide systematic responses to environmental concerns in the schools.

Teaching strategies employed by teachers to infuse EE

An inquiry was made about the teaching strategies that teachers are using to infuse EE in their lessons. The responses were similar to the following responses as quoted from some of the teachers who participated in the study.

Teacher A: *“Discussions and at times lecture. It is not practical to use student centered methods more given class size and resources.”*

Teacher B: *“I minimally try to use student-centered methods; this is because resources are not there, more especially time.”*

Teacher C: *“Mostly discussions question and answer in that the syllabus is congested; we are after time.”*

Teacher D: *“Same as with other topics, really it is all teacher centered. Teaching methods which engages learners more such as field trips, presentations, research are actually more suitable but time is inhibitive. Those that help them do something.”*

Teacher E: *“...come-on sir, my interest is to prepared students to pass the final examination. In this case, I use any appropriated method that accomplishes this goal. It matters less if it is this preferred teacher centered or teacher centered.”*

Head of Department 1: *“They use mostly teacher centered methods, though from time to time we beg them to use student centered ones as they are more beneficial.”*

Head of Department 2: *“To be honest, lecture methods take eminence among the teaching methods. We have had workshops on constructivism in teaching but I have not fully comprehended why the system is failing us.”*

The study shows that teacher-centered methods are more prominently used in infusing EE in teaching. Despite most teachers acknowledging that student centered method are most appropriate to teach EE. They contended that time was a significant inhibiting factor such that they were always racing against it to cover the bloated secondary school curriculum within very limited time frame. They also posited that class sizes were as well one of the obstacles towards the use of learner-centered methods in teaching EE. This is in unison with the findings of (Kirmaryo, 2011), and Ndaruga (2013) in Tanzania and Kenya respectively. The minority who claimed using student-centered pedagogies in their teaching of environmental issues admitted to the fact that they used them in a very limited way. This was mainly due to the factors pointed out above. However, it should be noted that several authors (Adeolu, Enesi & Adeolu, 2014; Muleya & Kalimaposa, 2014; Ndaruga, 2013) stress that in order to produce environmentally responsible graduates; EE should be taught using practical based methods. Notwithstanding this, the results show more inclination of teachers towards theory-based pedagogies. The next section presents and discusses results on the perceptions of teachers regarding the impact of infusing EE in teaching on the students.

Teachers’ perceptions on impact of EE on students

One of the questions asked during the research focused on finding out the views of the teachers as regards to whether the infusion of EE in teaching has helped to increase knowledge and action for the environment among the students.

Teacher 1: *“Their knowledge has increased, though their actions say otherwise.”*

Teacher 2: *“Yes, it has; however, they only tend to associate EE issues with other subject content which they have to master to pass final examinations.”*

Teacher 3: *“I think so, that is why when they see the teacher they will pick litter.”*

Teacher 4: *“I don’t think so, how can someone who knows how water is important to life, decide to wash dishes from taps and leave them running waiting to be told to close it.”*

Teacher 5: *“It’s true, this chaps understand what the environment is about. They are simply irresponsible. We have tried as teachers to teach EE for to change their attitudes, they are just impossible.”*

Teacher 6: *“...knowledge yes, but action big no.”*

Head of Department: *“It has, except there is no personal motivation and responsibility to act for the environment in that they have to be followed to do the right thing.”*

The majority of the teachers argued that environmental education has increased students' environmental knowledge in terms of the importance of the environment, and knowledge of actions that lead to environmental sustainability or degradation. In fact, further probing revealed that most students could theoretical answer questions on the two concepts with minimum difficulties. This finding is to some extent reflective of the results of the pedagogical approaches used by teachers to infuse EE in their lessons which focus on providing information to learners. According to Ndaruga (2013) and Jensen (2002), dependence on teacher-centered approaches in teaching results mainly in increasing the knowledge base of the students at the expense of equipping them with actions for the environment. However, a few teachers indicated that EE has actually failed to increase the knowledge about the environment among learners. They cited lack of action for the environment among learners as being indicative of this fact.

Besides, all the teachers perceived that EE has lamentably failed to enable students to take action against environmental problems. For example, teachers contended that students demonstrated irresponsible behavior regarding water use, litter disposal, and use and management of electricity. In this regard, they said that students washed their dishes from running taps and were more often than not leaving taps running after use. Also that they would not switch off lights in their classrooms after use, furthermore students were accused of irresponsibly disposing of litter unless confronted by teacher or if they noticed a teacher around them. It could be reasoned that this was to some extent a consequence of the teaching of environmental issues in relation to basically passing examinations (Kirmayo, 2011).

In short, the perception of teachers entail that EE, as infused in the selected schools in Botswana, has failed to produce learners who are motivated to act responsibly for the environment. The students have acquired knowledge about the environment; nevertheless, this knowledge has not translated in their action for environmental sustainability. It can further be reasoned that the knowledge seem not to be helping them to change their attitudes and perceptions about the environment (Jensen, 2002).

Environmental Resource use among students - teachers' views

One of the objectives of introducing EE in the school curriculum in Botswana was to ensure students acquire desirable attitudes and behavioral patterns in interacting with the environment in a manner that it protective, preserving and nurturing. In light of the objective above, teachers were asked to provide their views on their perceptions regarding how students interacted and used environmental resources.

Teacher 1: *“In resource use among students, there is a real problem, the challenge is big. Students misuse water, throw litter everywhere. I think as teachers, we are not handling EE issues well. Maybe there is need for support to teachers through short term courses or workshops on how to teach to change their attitudes and actions.”*

Teacher 2: *“They can just leave taps running without any conscious, wash dishes under a running tap one after the other. It is like they have a perception that water and electricity should be wasted as it is paid for, they don’t do such things in their homes. May be because we handle these issues only for students to recall them during examinations they don’t internalize these issues. There is little time to take them out either to appreciate the environment or to discuss issues with in a relaxed manner.”*

Teacher 3: *“They are irresponsible when dealing with resources, even senior students just throw papers everywhere though we have dustbins near classes. There is need to have a specific office in the school, like there is an office of Guidance and Counselling, to handle EE issues in a more practical way. This syllabus that touches all issues is not working. Teachers are specialists, if they are made to do things they don’t like, it is possible for them to do it for the sake of it.”*

Teacher 4: *“They waste resources like water and electricity. I think we are failing to make them to take responsibility. At home, everything is done for them, they are in school teachers are made to sit next to them to clean, the teacher makes sweeping Rota for them, the watchman is made to switch off lights for them. Our curriculum somehow needs some review; we give students less opportunities to explore EE issues and engage them in problem solving and taking actions to improve or nurture their environment due to congestion. Students disassociate what is taught in class and real life situations.”*

Head of Department: *“Unfortunately, despite us trying to infuse EE issues during lessons, students misuse resources. Students fail to voluntarily decide to pick litter when they see it, use a cup to drink water and even just to switch off lights when not in use they only wait to be told to do so by the teacher. Am not sure why, maybe it’s us adults who fail to negotiate with them on how they can better care for their environments. We only impose dos and don’ts on them without incorporating their views. Lack of active environmental clubs also could be the factor because with clubs students take a leading role and most of the time when they see themselves at the forefront they tend to be more responsible.”*

From the point of view of the teachers, the study reveals that students are not sustainably using environmental resources. This is demonstrated through waste of water such as leaving taps running after use, washing dishes under a running tap one after the other, and drinking water directly from a running tap without use of a cup. Also, through dumping of litter in undesignated places by students and their failure to voluntarily pick litter in their sight together with their unwillingness to switch off lights

when not in use unless commanded by a teacher are indicative of unsustainable environmental resource utilization.

The factors contributing to inappropriate environmental resource utilization among learners, as perceived by teachers vary. These range from inadequate opportunities to practically engage learners to take action for the environment to inculcate personal responsibility among them. Due to this lack of action oriented learning of environmental issues, students tend to disassociate theoretical knowledge of the environment from engaging in resource management practices. In fact, this challenge is compounded by teachers' teaching of environmental topics for the sake of students passing the summative final examinations as observed earlier. In actual fact, teachers merely apply teaching methods that are mainly knowledge-based so as to finish the syllabus to prepare students to answer examination questions. Accordingly, Kirmaryo (2011) argues, this approach makes students associate environmental topics as meant to be merely mastered for passing examinations.

Additionally, students have been reported to waste resources due to the attitude that the school is for the government and she has a lot of money. For example it was reported that the students were generally of the view that no matter how they used electricity, the Government cannot fail to pay for electricity bills. Furthermore, inactive environmental clubs or lack of them in the schools has been blamed for the unsustainable resource use among students. Clubs are credited for instilling sense of responsibility and actions regarding environmental problems in schools (Ndaruga, 2013, Silo, 2015). In addition, the small number of teachers trained in EE is cited as contributing to lack of action among students.

Still, most teachers generally use cleaning of the physical environment, gardening, and vegetation planting as punishment for students and hence the students have been made to view greening of the environment in terms of punishment (Ketilhoilwe, 2007). Also, teachers are said to be failing to make students take responsibility regarding cleaning their environment. In this regard, cleaning schedules are made for them and the same teachers strictly supervise cleaning. This, according to Silo (2015), makes students to assume that they should only attend to environmental issues under the supervision of the teacher and not through self-initiated action.

Relationship of School cleanliness and Students' attitudes/perception of the environment

The study inquired on the role of the of students vis-à-vis the apparent cleanliness of most schools as observed during the research. This was done to investigate if this was

subsequent to students' actions as informed by the learning of EE. In this case the teachers had this to say:

Teacher 1: *"It's not about the students' changed attitudes; it's about strict supervision of the school management on the teachers."*

Teacher 2: *"No, not at all. This is not a result of their exposure to EE. We have very good supervision strategies."*

Teacher 3: *"No, no, no, cleanliness of the school environment has nothing to do with EE. It is entirely the teachers' effort not students."*

Teacher 4: *Well, to some extent EE has contributed to the appearance of the school surroundings. Some credit could be attributed to the students' consciousness about the environment due to EE. While much is left undesired about their attitude concerning the environment, to a small extent EE is helping transform their behavior to better concerning the environment."*

Teacher 5: *"Yes and no. Yes because I believe you can rarely learn anything, EE inclusive, without it affecting your perception in some way. No because had their attitudes really been changed been by the EE they learn, they would not wait to be pushed to attend to environmental needs."*

Head of Department: *"Believe me; the infusion of EE in the lessons has done little to help students contribute to the cleanliness you can see around. These guys, students, do not want to take responsibility; they are only forced to do it in a way to avoid punishment. We have a supportive staff to help with supervision."*

The majority of the responses entail that EE is not a factor influencing the sanitary outlook observed in the schools. In fact, most respondents attributed this tidiness to the fact that students are forced to clean under supervision of teachers. Moreover, school cleaning such as litter picking, sweeping, and/or grass clearing, is used as one of the prominent punishments for students by teachers. In the view of this author, the use of cleaning of the environment as punishment to students has contributed to lack of self-motivated environmental action among them. This is basically because they have been 'cultured' into associating school cleaning with punishment. Similarly, Ketlhoilwe (2013) posits that students hate cleaning the environment because they see it to punishment, not as necessity.

Notwithstanding the observations above, a few respondents made cognizance of the fact that EE has had an influence towards students' participation in up-keeping the school environment. Associated to this attribute is that EE has engineered a positive attitudinal change towards the environment among some learners.

Students' views on EE and their perceptions of the environment

Apart from finding out from the teachers regarding the perception of the learners concerning the environment, and leaning of EE, this researcher had to find out from the students themselves. In this regard, all the participating students in the study stated that they are taught about the environment mainly in social studies and science. Besides, they supported the idea of having environmental issues integrated in the curriculum. The reasons advanced for their support included the following, to:

- i) be able to understand the importance of keeping the environment clean,
- ii) to appreciate the beauty of the environment,
- iii) understand how best to care for the environment for it to be sustainable, and
- iv) ensure that environmental resources are conserved.

In essence, students' responses are indicative of the fact that they understand the meaning of the environment, possibly out of their leaning of EE. Also that EE has enabled them acquire knowledge about the importance of the environment and why it need to be sustained (Silo, 2015).

Furthermore, all students saw the need for having an environmental club in the school. Nevertheless, they all lamented that the club did not exist in their school and that they had never celebrated an environmental day in their time during secondary school. Moreover, most of them could not remember ever going for a school field trip, or simply going out to investigate a local community environmental issue. In view of these assertions, it could be argued that probably the lack of action among students for the environment, is to some extent being influenced by their lack of exposure to aspects that engage them into meaningful actions to inspire them for environmental sustainability (Nadruga, 2013; Jensen, 2002)

The study further inquired about the attitudes of the students towards the environment to further appreciate the effect of infused EE in lessons on students' attitude. With respect to how students felt when they were made to clean the school environment, majority of them said that they did not like it. They basically did it to avoid being punished by their teachers. Some declared that cleaning the school surrounding was too much work. It should be the work exclusively assigned to hired school cleaners. If the school realizes that cleaners were not enough, they should hire more of them in steady of troubling students. A student's role was simply to learn.

In essence, the sentiments of students reveal that they feel it is not their responsibility to clean the school environment. According to them, that task essentially belonged to other people apart from themselves. Their involvement in cleaning it basically done out of duress because of fear of being punished by teachers. These sentiments are, in fact, fittingly matching with the earlier stated views of teachers

concerning their perceptions about students' attitudes towards maintain a clean environment.

The study also sought to find out whether students could participate in cleaning the environment without the supervision of teachers. To this effect, the study discovered that all students believed that they were responsible enough to do the cleaning without the supervision of teachers. This finding is contradictory to the response of teachers. According to the assertions made earlier by teachers, students were generally unable to carry out school cleaning without being pushed by teachers. The contradiction could be stemming from the fact that either teachers had overstated the lack of student self-driven action for environmental sustainability or students were being economical with the truth so as to save their image from this author. The latter reason seems more realistic as even the students themselves in the alluded to the fact that they participated in maintaining the environment out of duress from the teachers and felt it was not their responsibility. This is further confirmed by Ketlhoilwe (2007) when he reports that students hate school cleaning.

Further investigation was done on the attitude of the students towards the environment. When asked about what they would do if they had an empty packet of snacks and there is no one around and no waste bin no nearby. Most of the students stated that they would simply throw it away hoping that no teacher sees them or if they were noticed, they would pretend they dumped it unwittingly. Regarding what they would do if they saw a fellow students littering; majority said that they would simply mind their business because there were people employed basically to clean the school. However, a few of them said they would tell them to collect the waste or even warn them against ever doing it.

On the question about their water drinking and dish washing habits, students responded that they did not wash dishes from sinks because they were dirty and did not use cups to drink from taps as they viewed it as time wasting. Some of them, actually believed that this method of drinking water and washing dishes was not a significant form of wasting water but argued that water wastage was blamed more on those students who damaged taps without reporting the breakages and leakages to the maintenance personnel. They also lamented that even when reported to the responsible authorities, they take long to attend to the problem. Therefore, it can be argued that while there is evidence that students' attitudes are still greatly not environmentally friendly, lack of responsive and responsible environmental ethos in the schools has worsened the situation (Silo, 2015).

A question was asked about who the students felt was responsible to switch lights off when not in use. Essentially, they stated that during the day it was the duty of

the class monitor, while after study time it was the responsibility of the night watchman. In short, students perceived the obligation of switching off power not in any way lying on them but as other people's mandated.

The preceding results of the study reveal environmentally unfriendly attitudes among students. This has been expressed through students' belief that it was not their responsibility to clean the school environment; indiscriminate disposal of waste; lack self-motivation not to litter and lack of interest from stopping others from littering; wasteful use of water; and lack of personal responsibility to switch off lights after use.

Accordingly, scholars (Ifegbesan, 2008; Silo, 2013) made corresponding observations by remarking that the greatest challenges facing developing countries is unhealthy disposal of waste as evidenced through the failure of secondary school students in Botswana to act responsibly towards waste, water and sanitation, and electricity management. This is further corroborated by this researcher's site physical observations where he established that a number of taps in the study sites were vandalized, other were leaking and students freely used these facilities despite their state. This defeats the observation made by the United States Environmental Protection Agency (EPA) (2015) that schools are to repair water leaks, replace leaky toilets and give priority in preparing learners to be water efficient users. This is one way of transmitting EE goals to instill in learners value for water so as to ensure sustainability of the resource.

Additionally, the researcher noted that it was most common during meal breaks for students arbitrarily throw food leftovers and to queue at the taps to wash their dishes whilst water was running continuously without them realizing it is waste. Sinks around the kitchen area were blocked and dirty. Sadly, it had to generally take the initiative of teachers on duty ensure students collected litter and closed taps before they made their way to their classes. In this regard, Sundar (2010) advises that schools must use restrictions on taps like automatic shut offs, and ensure regular maintenance.

Conclusively, physical observation by the researcher, and interviews yielded parallel results. Accordingly, both sets of findings indicate that students had negative attitudes towards the environment. This goes to show that infusion of EE in teaching has not been effective enough to change the attitudes or perceptions of students to have them molded in environmentally responsible learners.

As such, EE as taught in the selected schools in Botswana has failed to live up to the expectations of Sundar (2010) that EE builds personal commitment to conservation, and actions that promote environmental sustainability as a mode of living among learners.

Conclusion

The study ascertained that indeed Environmental Education (EE) was offered in the selected schools in Botswana. The teaching of EE follows an infusion approach where a number of environmental issues are integrated in the curriculum and where and/or when necessary teachers incorporate EE in lessons. More importantly, the study has revealed that the methods that are used to teach the subject are fundamentally teacher-centered and are geared more towards enriching students with environmental knowledge. Subsequently, the results indicate that secondary school students possess environmental knowledge that they fail to translate into action for the environment. Their lack of action could largely be blamed on the teaching methods that do not engage learners in action for environmental sustainability.

Besides, the study establishes that EE as approached in Botswana has failed to transform the attitudes and perceptions of secondary school students towards being responsible environmental stewards. Generally, students portray irresponsible environmental attitudes concerning environmental resources and more often than not they indiscriminately dispose of waste in undesignated points.

The first objective was to find out how learners perceive the environment. That is their immediate understanding, recognition and appreciation of the environment. The study reveals that learners do not see the environment as a resource worth managing as evidenced by how they relate with the environment. They do not see environmental management as their responsibility thus have a negative perception of the environment. This agrees with Palmer (1998) who argues that the way individuals perceive the environment triggers an attitude they hold about the environment which is often evidenced by actions they display.

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