Rhodes University

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ACTION COMPETENCE AND WASTE MANAGEMENT: A CASE STUDY OF LEARNER AGENCY IN TWO GRAHAMSTOWN ECO-SCHOOLS.

A half thesis submitted in partial fulfilment of the requirements for the degree of Master of Education (Environmental Education)

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Abstract

There has been a growing need in environmental education to develop students' ability and will to take part in democratic processes that enable them take environmental action in their local environment. This study examined learner action competence in waste management practices in two primary school contexts in the Eastern Cape, South Africa. An interpretive case study design is used to probe how learner participation in Eco-School waste management practices enabled the acquisition of knowledge in purposeful learning and action experiences that developed the vision and agency of informed action. The research was centred on two guiding questions:

1. How informed, purposeful and action-orientated is learner participation in Eco-School waste management activities?
2. What Eco-School waste management activities are fostering active participation towards a learner-led agency?

Educators in the two schools were interviewed and Eco-School portfolios were examined for evidence of the learning activities and learner achievement. This provided the contextual data for reviewing focus group interviews to probe what was significant to learners, what they came to know and how they had contributed to the process of developing better waste management in the Eco-School context.

The evidence generated in the study was used to identify the roles of the various players, the significant activities and processes that enabled and constrained the emergence of learner-led agency. The main findings in the study were that teacher intentionality and school management ethos were significant in engaging learners in meaningful waste management activities in both cases. The study also revealed that although most of the waste management activities in both cases were teacher-initiated, there were spaces open for learner initiatives. However, it appeared that the activity-based waste management practices mostly allowed learners to learn how to do waste management more than allowing them to find out more about the scope and nature of

the problem of waste. This then resulted in learners talking more about what they were doing with waste than talking about what they knew about waste.

There were differences in the way in which learners approached waste in the two cases. In the one case, Kingswood Junior School learners used waste artistically and carried out activities that allowed for better use of waste resources like paper while in the other School, Grahamstown SDA School, learners approached waste as a resource for making money. However, in both cases, learners appeared to enjoy the positive experiences of doing things that contributed to a cleaner environment and were of benefit to others and this gave them a sense of pride to share their experiences with others.

This study was significant as it allowed me to probe learner participation and examine the development of their action competence through listening to the voices of the learners themselves and understanding what was important to them about the knowledge they gained and their vision of better waste management.

Dedication

This thesis is dedicated to my beloved mother, the late Mrs Alice Irene Chiphwanya who was a mother and a teacher. She dedicated her work in ensuring educational quality in Malawian schools as a District Education Officer and went beyond the call of her duty to make sure that teachers were doing their job, teaching when they were supposed to be teaching and that learners were not prevented from the gift of education by being asked to do other things when they were supposed to be learning. I will always love you mama.

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CHAPTER 1

INTRODUCTION TO THE RESEARCH

1.1 OVERVIEW OF THE CHAPTER

This chapter presents the aim of the study and background to the research, and explains what motivated the research. It describes the context in which the research took place as well as the key educational ideas that informed the study and the research questions.

1.2 AIM OF THE STUDY

My research interest was to examine how learner action competence is developed amongst learners participating in waste management practices within an Eco-Schools context in two Grahamstown schools. My research questions were

1. How informed, purposeful and action-orientated is learner participation in Eco-School waste management activities?
2. What Eco-School waste management activities are fostering active participation towards a learner-led agency?

1.3 CONTEXT IN WHICH THE STUDY EMERGED

In a preliminary study that I carried out with a colleague in 2008, (Silo & Chiphwanya, 2008) we found out that some learners were involved in school paper recycling activities without a clear grasp of the environmental importance of better waste management and recycling. Most of them said they were doing it to gain merits or because it was part of their technology lesson and they wanted to get good marks. This experience prompted me to want to explore action competence as processes of informed purpose and capability. This shaped my research interest in action competence as looking at the interplay of knowledge (being informed), purpose (learner-led activities) and civic capability (an agency to do certain things) in Eco-School programmes on waste management.

At the time of the study, not much research had been done on learners and their learning in an Eco-School context. Mbanjwa (2002) reviewed the use of materials on waste management issues in the curriculum but did not look into learner involvement. Haingura (2009), probing the role of educators, found that enthusiastic and committed teachers are needed for Eco-School programmes to achieve the desired outcomes, and that most Eco-School activities were more teacher-initiated than learner-initiated. The Wildlife and Environment Society of South Africa also found that they experienced challenges in working with learners in an Eco-School context where there was no support from teachers and school principals (WESSA, 2007). More recently, Rosenberg (2008, p.11) in a review of Eco-Schools programme found that learners' work was '*often at levels below what is required by the curriculum for their Grade* 'and that evidence in their written work pointed to their engagement often being '*at the level of participating in activities*'. This was an important finding to inform my study's purpose of probing learner participation and agency in Eco-School waste management activities.

To do this I worked with the concept of action competence as this refers directly to the desired outcome of participation in environmental education activities. According to Jensen and Schnack (2006, p. 473) the originators of the concept, it is not the task of the school to simply involve learners in an activity or to improve the world with the help of learners. Action, according to Jensen and Schnack, is more than activity and must be directed towards solutions to a problem that is being focused upon and where students are involved in deciding what to do. The Eco-Schools programme was designed to involve learners in action-orientated environmental learning projects. Central to this orientation is an emphasis on democratic participation where learners are active citizens in their school. Here the idea is that they are encouraged to take decisions towards improving environmental matters in both their school and home environments.

In line with this focus on learner-led agency to act, in this research I examined the action competence aspects and waste management activities that enabled school learners to acquire the necessary *'courage, commitment and desire'* (Jensen & Schnack, 2006, p. 472) to get involved in solving their waste management issues. In other words, I looked at how learner

participation in waste management activities helped build an informed, action-oriented competence and civic responsibility in the two Eco-Schools in Grahamstown.

The research was designed to help me understand how action competence is developed through children's participation in waste management activities. Murdoch (1993, p. 154) notes that an environmental education programme that gives children positive experiences in the environment and helps them to understand more about the environment will naturally lead to a desire to act for the environment. I examined the roles of teachers and learners, and how learners felt about their participation in the waste management activities. According to Jensen and Schnack (2006, p. 481), there are four aspects of action competence namely '*knowledge/insight, commitment, visions and action experiences*. In this research, I was interested to find out if these learner-led processes were present and how they played out in the waste management practices within the Eco-Schools examined.

1.4 THEORETICAL FRAMEWORK OF THE STUDY

Jensen and Schnack (2006) are critical of the idea of behavioural change for its lack of emphasis on agency and democratic choice. They use this argument to call for action competence and note that *'related to an action, there will always be a conscious making up of one's mind, while this is not necessarily the case with a behavioural change which could be caused by pressure from other people (e.g. a teacher or peers) or by other influences such as advertisements'*. In action that involves agency of choice, one decides to do something alone or together with others. The research thus involved looking at the power relations amongst learners and with teachers, examining for example, the way waste management was being run and the extent to which the activities were teacher-led or learner-led. The Eco-School programme also encourages learners to critically reflect on their actions, in this case, waste recycling, to assess whether indeed by recycling, learners were actually solving the environmental problems that they aimed to address. Schnack, Jensen and Simovska, (2000) elaborate the idea of action competence as a general curriculum approach and as an ideal and not as a teaching approach or an objective to be reached. It was taken into account in this research that the idea of action competence was developed in Denmark where, according to Schnack, '*children learn not to take everything at face value,'* and that they '*ask critical questions'* and challenge knowledge. However, in

an African context, this is not the way children are brought up. In other words, in a typical African context, children are not expected to challenge those older than them, let alone their teachers. The concept of action competence was used to examine the Eco-School practices so as to address the research goal and gather evidence to answer the research questions.

1.5 OVERVIEW OF THE CHAPTERS

Chapter 1introduces the study and provides the context in which the study emerged. It also states the aims of the research and the research questions of the study. It also briefly describes the theoretical framework of the study.

Chapter 2 presents the literature that informed the study. It presents the theories used in the study as well as what other researchers found, including other people's criticisms. It then presents literature on the history and context of the Eco-Schools programme in South Africa as well as the history and context of waste education in Makana District, which was the study area.

Chapter 3 describes the research methodology and data generation and analysis methods that were used in the study. It describes the research sample and how an interpretive framework was used to find out and interpret action competence.

Chapter 4 represents the data generated during the research process from semi-structured interviews with teachers, learner focus group interviews and document analysis of Eco-School portfolios. First a contextual profile of the two case studies is represented, followed by a report of waste management activities in the two cases and lastly, learner narratives on waste management practices.

Chapter 5 examines the data represented in chapter 4, where 5 analytical statements were derived and are discussed in this chapter to help answer the research question regarding the development of learner action competence. Here I also engage with the literature reviewed in chapter 2 to discuss the 5 analytical statements.

Chapter 6 provides a summary of the main findings, a critical reflection on the research process as well as some recommendations based on what has been learnt in this study.

CHAPTER 2

A REVIEW OF THE LITERATURE ON THEORY, HISTORY AND CONTEXT OF THE STUDY

2.1 INTRODUCTION TO THE RESEARCH

This chapter presents the theoretical dimension of the research (the Action Competence Framework) and the literature that was used in this research, and these will further be discussed in Chapter 5 in relation to the research findings. First, it presents literature on the concept of action competence, the history and context of learner-centred education in South Africa and the Eco-Schools context in which environmental education takes place and lastly, the context of waste education in the study area.

2.2 THEORETICAL FRAMEWORK OF THE STUDY

The Action Competence Concept

The concept of 'Action Competence' has played a central role in the field of environmental education in Denmark (Breiting & Mogensen, 1999) and to develop students' action competence means 'developing their ability and will to take part in democratic processes concerning man's exploitation of and dependence on natural resources in a critical way (Jensen & Schnack, 1997 Breiting *et al.*, 1999 in Breiting & Mogensen, 1999). Therefore, the overall goal in environmental education is to develop students' abilities to act. This concept has been adopted in many countries including Southern Africa where there is also an emphasis on learner-centred, activity-based education.

Carlsson and Jensen (2006), state that the ability to take environmental action is dependent on a number of factors, some of which are insight and knowledge, commitment, vision, experience and social skills. They further note that insight and knowledge are important as students require a 'broad, positive, coherent and action-oriented understanding of environmental problems'. They therefore require coherent knowledge of the '*problem of concern, the nature and scope of the problem, how it arose, who and what it affects and the range of possible solutions for it*' (Carlsson & Jensen, 2006). Jensen and Nielson (1996) in their work in Danish schools noted that

it was important to have regular shifts between '*theoretical teaching, discussions in classrooms and out-of-school activities*'. They also noted that pupils gained more knowledge and experienced more change in awareness from their '*teachers' theoretical explanations of results from activities than the activities as such*'.

In terms of commitment, Carlsson and Jensen (2006) note that students need a '*motivation to become involved in change in relation to their own lives and so as to create a dynamic society*'. So they not only need the knowledge acquisition but also commitment for this knowledge to be transformed into actions and group work is also important here.

For students to have the '*ability to go behind*' the environmental issues and think creatively was seen as involving the development of visions of what their own lives could be like and how the society and the environment could be improved in relation to a particular problem that is of concern to them. This could take the form of students' dreams, ideas and perceptions about their future lives and the society in which they live.

Carlsson and Jensen (2006) also noted that students need real-life experiences by participating individually or collectively to facilitate change. Therefore students take concrete action during their learning process. Also, a number of social skills were considered valuable in the development of students' action competence and they include self-esteem, the ability to co-operate, self-consciousness and self-confidence. 'Critical thinking' or 'critical decision making' was also suggested as an important component, (Carlsson & Jensen, 2006).

Breiting, Hedegaard, Mogensen, Nielsen, and Schnack, (2009) argued that action competence has the following elements cognitive, value-based, social and personality-related. They, however, noted that action competence cannot be viewed as merely the sum of its elements because it is more than that. They further argued that in terms of being cognitive, learners need to have knowledge of environmental issues as well as knowledge of how to do/take an environmental action. They noted that it is value-based as learners search for normative arguments, and that it is social

as learners become aware of '*arguments communal potentials*' and lastly, it is personality-related as learners have courage and feel responsible for action, and they also have preparedness and inclination to act, (Breiting, et al 2009, p49).

According to Jensen and Schnack (2006), concerns about action competence as an educational concept are based on problems that were faced in environmental education that had tendencies of viewing education as a form of behaviour modification. At the same time, action competence was seen as an alternative to the traditional, science-oriented approach to environmental education, (Jensen & Schnack, 2006, p471). They used examples from their work in Danish schools to differentiate between action and activities and behaviour change. Jensen and Schnack (2006) defined 'action' as when students 'on their own accord' decide to investigate or are involved in deciding to investigate a problem and come up with solutions that are targeted at solving a problem. Such actions can be direct or indirect but they ought to be geared towards solving a specific environmental problem. They used examples of their work with pupils where in one case pupils were faced with an environmental challenge and came up with a solution that was geared towards better environmental management, and in another case, pupils were also faced with an environmental challenge and a solution that came out resulted in them writing a letter to a minister. Jensen and Schnack (2006) argued that an environmental action was the only one that helped them solve an environmental problem.

Critics of the action competence concept have argued that despite being criticised by many environmental educators, science has a role to play within effective environmental education through the achievement of '*scientific knowledge and capabilities*' that are important in understanding science, environmental issues and their interrelationships, (Bishop & Scott, 1998, p225). They further argued that the originators of the action competence concept, Jensen and Schnack base their arguments on their work with schools in Denmark, from a Research Centre for Environmental and Health Education at the Royal Danish School of Educational Studies in Copenhagen (Bishop & Scott, 1998, p225-226) but that pupils need opportunities which involve the generation of situated knowledge that promotes the

cause of scientific literacy and scientific capability in order to develop action competence. Therefore, they still feel that there is a great need for scientific literacy.

2.3 HISTORY AND CONTEXT OF STUDY

In South Africa the concept of action competence has come to occupy a central position in environmental education particularly in the context of Eco-Schools. The concept is noted in the *Learning for Sustainability* pilot project conducted by Janse van Rensburg and Lotz-Sisitka (2000) as a framework for learner-centred, activity-based education towards democratic citizenship. These educational processes encourage individual rights, including a right to one's own point of view, and tolerance for the views of others. They also allow learners to make up their own minds about a particular concern. A concern for learner agency and informed action in school-based environmental activities is found in both the Earth Charter (Kalaw, 2000) and Local Agenda 21(Eco-Schools International, n.d.).

The Earth Charter is one of the global declarations for building partnerships for sustainable development and in Chapter 14a it states that there is a need to "*Integrate into formal education and life-long learning, the* ***knowledge,*** *values and skills needed for a sustainable way of life*" (Kalaw, 2000 p94). One of the ways suggested to achieve this is through "*providing all, especially children and youth, with educational opportunities that empower them to* ***contribute actively*** *to sustainable development*" (Kalaw, 2000, p.94). One of the environmental projects that schools are involved with through the Eco-Schools programme in response to Local Agenda 21 is waste management and recycling. Agency of informed (knowledge) civic action (active contribution) is at the heart of environmental education practices in school and community contexts.

In line with these international guideline documents on environmental education, learners in Eco-Schools in South Africa are encouraged to work on environmental activities in an action-oriented way where they are involved in making decisions on their action projects (Rosenburg, 2008).

2.4 EDUCATION AND ENVIRONMENTAL EDUCATION IN SOUTH AFRICA

In South Africa, Curriculum 2005 (C2005) was introduced in the year 1997 to replace the *Bantu* curriculum which was associated with bias, discrimination and social injustice as well as '*mental underdevelopment, authoritarianism and rote learning*' (Nelson Mandela Foundation, 2005). C2005 was founded on outcomes-based education and it also included the values of the South African constitution. This change in the educational curriculum was important in order to improve the quality of education in South Africa.

Indications are that there is a severe lack of educational quality in Southern African countries including South Africa. These countries are characterised by severe poverty and increasing populations which puts pressures on natural resources. Therefore, it is viewed that environmental education has a potential to improve educational quality and quality of life in this region as it allows students to apply curriculum-based work to a real problem-solving exercise (Sinclair, Clacherty & Lotz, 1997a). The Nelson Mandela Foundation (2005) presented quality education generally as an education that has among others, the following aspects:

- The teachers are qualified (and understand fully what they are teaching) and are dedicated;
- Learners have easy access to their schools (good roads);
- and are well fed;
- Parents are involved in their children's education (provide necessary support and materials);
- The curriculum helps to contribute to quality of life by empowering learners with skills to be qualified citizens who can use their education to improve their lives (education for livelihood);
- Learners are able to understand their teachers (use of language is not a hindrance to their education);
- Schools are well resourced and the school infrastructure is not a threat to the children's life (e.g. the buildings and classrooms are in good condition);
- Education is sustainable.

According to Jensen and Schnack (2006), one of the overall objectives of environmental education is to build up students' abilities to act '*their action competence with reference to environmental concerns*' (Jensen & Schnack, 2006). Rosenberg (2008) noted that Eco-Schools South Africa is being used by various partners as a framework for supporting environmental education in schools where learners acquire skills for environmental action in their communities.

2.5 THE ECO-SCHOOLS PROGRAMME IN SOUTH AFRICA

After the UN Conference on Environment and Development – the Earth Summit - of 1992, the Eco-Schools programme started in Europe in 1994. Its purpose was to involve young people in finding solutions to environmental and sustainable development challenges at the local level. Since 2003, some schools in South Africa have been involved in the 'Eco-Schools' Programme and in South Africa, it is being implemented by the Wildlife and Environmental Society of South Africa, in partnership with WWF SA (World Wildlife Fund South Africa) and with funding from Nampak. An Eco-School is a school that has made a commitment to improve its environmental performance and works towards better environmental learning and better environmental management. (Eco-Schools handbook, 2009). This programme is part of the Eco-Schools International in which there are 21,000 participating schools worldwide and about 6,000 of them have qualified for a green flag. The green flag is a status of achievement and is awarded to schools that have met certain criteria. (Eco-Schools International, n.d.). In South Africa in the year 2008, there were 989 schools that registered for the programme nationwide and 525 of these managed to submit their portfolios for assessment at the end of the year. Of these, 420 received some kind of an award with 14 of them maintaining an international flag status. (Eco-Schools National Programme, 2008). Although action competence is mentioned on the international Eco-School web site, the South African Handbook is orientated towards action-orientated learning without specific reference being made to the theory of action competence.

In this programme, registered schools receive a pack with materials to help teachers and learners implement their programmes. They have to choose a theme or themes that they want to focus on and then the teachers prepare lesson plans around that theme, in line with

their learning areas. They also implement a project or projects with learners and with support from other teachers, the School Governing Board and the Parents-Teachers Association and other stakeholders (Eco-Schools Handbook, 2009). It is based on the Active Learning Framework which allows learners to actively engage with their environment.

2.6 HISTORY AND CONTEXT OF WASTE EDUCATION IN MAKANA DISTRICT

In Grahamstown, 6-10 schools register each year for the Eco-Schools Programme and about 4-5 of them submit a portfolio. In 2008, 4 participating schools in Makana received an award, with two of them receiving a bronze certificate and two others, a green flag. (Eco-Schools Makana Node, 2009). In 2009, there were 10 schools which registered as Eco-Schools. Three of these schools chose to do projects on waste reduction and creative re-use (Eco-Schools Makana Node, 2009).

In an assignment task (Chiphwanya, 2009) conducted at the beginning of 2009, I found out that a number of schools in Grahamstown which may not register as an Eco-School will have an eco club or an environmental club that does projects in the school to improve their environment. For example, some do food gardening, paper recycling, or litter clean-up campaigns among others. These programmes are meant to enable pupils to gain some environmental learning through their involvement in the activities. One teacher from a school in Grahamstown reported to me that part of the reason why her school was awarded the cleanest school is that all teachers in the school make their learners clean their classrooms and they also use cleaning as a form of punishment (Teacher A, personal communication, February 20, 2009). The teacher reported that in cases like these although learners take part in cleaning their school, not much environmental learning, if any, takes place. Some of the schools in Grahamstown are part of the Eco-Schools programme which allows learners to carry out projects in their schools for environmental learning and learners are encouraged to work on environmental activities in an action-oriented way where they are involved in making decisions on their action projects (Rosenburg, 2008).

Over the years, in Makana District, different groups have also been interested in telling others about the issues/risks associated with waste in Grahamstown. Among these are

students from Rhodes University. In 2008, 3rd year Journalism students at Rhodes University had to work on an environmental education and awareness project. Different groups were allocated different environmental issues that they worked on. These projects covered among others, the areas of sanitation, water, land degradation, land use, energy, and food gardening and waste and recycling in Grahamstown. They also conducted interviews with various groups of the community as well as Makana Municipality. They used this to document and present their findings first to the township residents and then later to the rest of the Grahamstown residents at Rhodes University. They used different media to present their findings like DVDs, voice recordings for radio broadcasting, newspaper articles, photographs, posters as well as exhibitions. According to the lecturer who gave the students this task, this activity by third year students was a one-off task and it was very likely that in the year 2009, they were going to choose another topic although a number of staff members in the department felt that it would be nice for the third year students of 2009 to focus on some kind of follow-up programme from the previous year's. Although the Makana Municipality developed a Local Environmental Action Plan in 2005 in which one of the goals is to raise public awareness, at the time of the study they were not involved in any form of waste education. According to one municipal worker, years ago they had the ***'siyathotho'* waste management Project** where 6 ladies who had been trained went from street to street, and had street committee meetings where they informed people about the location of the containers for dumping waste and where the identified dumping places were so as to prevent illegal dumping. (Municipal Officer A, personal communication, February 27, 2009). He explained that they went from extension 9 all through to Fingo Village and that took them three years. After the three years they started looking to see if there was any improvement, and they found that there was none. Then they decided to stop the project and they started to send out letters to all schools and the University on a yearly basis and they told them about the things that the municipality can educate them about. The municipal officer explained that some schools started supporting them and they did some education with them. They took a couple of schools to the landfill site and showed them what was going on there, how they operate it, and they gave them a little bit background and history of waste, what they must do and what they must not do.

But at the time of the study, the municipal officer said that they only did this when approached by the schools.

Through the municipality's involvement in working with other stakeholders like the Kowie Catchment Campaign and the Makana Environmental Forum, it was suggested that the municipality creates the post of an environmental officer whose duties among other duties, would be the responsibility of environmental awareness in Makana. This person was employed by the municipality and there were plans that once funds had been approved, he would start embarking on this programme.

One other major source of information on environmental issues in Grahamstown, including waste, was the *Grocott's mail*. Over the years, a lot had been written about how some residents of Grahamstown expected the Municipality to take responsibility for all litter that was dropped by people in the streets and they 'make the city dirty', as well as other litter that was thrown into rivers and near people's homes. Reporters from *Grocott's Mail* interviewed different groups to get their opinions and they also encouraged people to write articles that were published in their paper. Through reading articles that had been written over the years, one could get a sense of what the situation of waste in Grahamstown had been like.

According to an interview with Municipal Officer A, these programmes were there to address the issues of illegal dumping, littering, and the health risks associated with these that mostly affected residents of Grahamstown West (Grahamstown West is where most of the poor, unemployed black community resides). In most schools, anti-litter campaigns as well as river clean ups help make schools and their surroundings which otherwise would have been dirty cleaner, (Chiphwanya, 2009).

According to the municipal officer A, the municipality had been providing free refuse bags to residents of Grahamstown West once every week for a long time before Rhini municipality merged with Grahamstown municipality to help people who were not able to purchase refuse bags. At that time, people would put their waste in one place and the municipality would then come once a week to collect it. People were only allowed to take their refuse out on the specified collection days to prevent a situation where waste would be lying around. After the two municipalities merged, Makana Municipality still continued to provide refuse bags to residents of Grahamstown West and they asked the ward

councillors to hold meetings with their people and ask them where they wanted to have the 'identified dump sites' where the council would place containers in which people could put their waste, instead of putting the waste on the ground. They also put up signs to show people that those were the identified dump sites where they should put their waste inside the containers.

The municipal officer indicated that there were no risks as yet associated with waste, but it could become a risk where people illegally dump their domestic waste near people's homes and children go and play there or domestic animals open the refuse bags and start eating their contents. Or, where people send small children to dump their waste and the children just throw the waste around the containers and not inside, or where people forget or just do not want to take out their waste on the waste collection days and then their waste just lies around for days.

Another situation is where people use the refuse bags given to them for other purposes and then on the day when they have to empty their bins, they find that they do not have a refuse bag so they just dump their waste on a pavement. However, through reading some articles that the Grahamstown community send to *Grocott's Mail* and from interviews conducted by Rhodes 3rd year Journalism students in 2008, and also through informal discussions with people living in the locations, there was already a health risk as there had been reports of illegal dumping in some locations in the township. People living in the townships also reported that children do play with waste from these illegal dumpsites and that some of them had contracted skin diseases. There had also been reports that one other illegal dumpsite was behind a fence of a pre-school in the townships and that sometimes this waste was thrown right inside the premises of this school. (*Grocott's Mail*, 22 January 2008). It appeared from this evidence that some government environmental programmes may perpetuate a dependency syndrome among residents and that awareness campaigns may not always lead to behaviour change.

However, an informal discussion with one other resident of Grahamstown West revealed that this risk/issue did not affect all people as she reported that she did not experience any problems with the way waste management was done in her area even though the dump site was not far from her home and their rubbish was collected every week by the municipality.

She also added that nobody threw their waste around the containers but they put it inside to keep the place clean.

Irwin (2001) found that local construction of environmental issues and problems could vary within a community, and that there was a possible gap between official environmental discourses, in this case what the municipal workers say, and the heterogeneous, hybrid and embedded understandings presented by discrete public, in this case the residents of Grahamstown West some of whom had reported that there was an issue while others reported that there was no issue or risk.

Beck (1992) also comments that 'people themselves become small, private experts in risks of modernisation' and in this case, people talk about how illegal dumping of waste near people's homes was causing many health problems. He also talked of 'chains of causality and cycles of damage' where in 'differentiated divisions of labour, there is general complicity and the complicity is matched by a general lack of responsibility'. Here, everyone is cause and effect and thus, non cause. An example of this is evident in the DVD that Rhodes Journalism students produced, where the community members blamed the municipality for lack of service delivery because the streets were dirty, and there was illegal dumping in the locations and in rivers while on the other hand, in an interview with the municipal officers, they reported that the public were responsible for the dirty streets and the illegal dumping because it was not the municipality who was doing that. From listening to how the municipal officer narrated his experiences of working with community people in waste management in Makana, one can note such chains of causality and cycles of damage;

> "People are coming here and they are saying 'look at the town!' and I say 'yes!' they say 'it's so dirty! Why is the municipality not cleaning it?' I say 'well ma'am, who is making it dirty? Is it the municipality who's taking the black bags and putting them all over the show? No! Who's doing it? They say it's the public. I say exactly! Don't come here and come and tell me, you know, they think that if there's a problem on the street and it's dirty, then we've got a separate group of people that are sitting here the whole day doing nothing, and suddenly you can just press them and say 'listen Jump the streets are dirty', you must clean up! That's not the case! As I explained to you we've got the landfill site, we've got the domestic refuse that we remove, we now clean the toilets and the identified dumping spots. So that is what we do. Then we clean the CBD streets, we've got street sweepers and

> we've got public toilets that we clean. Now if there's illegal dumping in the streets, under the bridge or under the railway, or whatever a person complains about, then I have to take my team who are supposed to clean the identified dumping spots, I have to take them from that work and go and do that illegal dumping . Now I'm doing that illegal dumping but my work that council is supposed to do is now lagging behind. And now I'm getting problems from the community or from the council or whatever , why is this work not being done? But in the mean time, the community is making a mess". (Municipal officer A, personal communication, February 27, 2009). See interview schedule in Appendix 1.

Beck (1992), also comments that risks adhere to class pattern and an example in this case is the fact that problems of illegal dumping are only experienced in Grahamstown West. All Grahamstown East residents have to do is to take their refuse bags outside their homes on the collection days and the municipality comes and collects it from there, or if they forget to take it out, then they can just drive to the landfill and dump it there. This is not the same with Grahamstown West residents. Some of them have to walk for some distance to their nearest dump sites. And it is also assumed that every household owns a wheelbarrow to help them with this. In most cases, it is small boys who are expected to do this and they end up not doing it properly, and they either just dump it in the pavements or they dump it outside the containers that the municipality has put in place. The result is that children may go and play there or domestic animals may go and eat from the bags causing a health risk to community members.

2.7 SUMMARY

This chapter has reviewed literature on the shifting from behaviour change to action competence in environmental education and other research that was done with Danish schools in action competence. I have reviewed the integration of action competence concepts in the South African education and the Eco-Schools context and presented the context of waste education in the study area i.e. Makana District. The following chapter presents the methodological designs that the study undertook.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter discusses the research design and decisions that were taken to achieve the goals of the research and to answer the research questions. A number of methods of data generation and analysis were used as shown in Table 1 below. These were developed to establish learner perspectives and teacher approaches and were probed in observations of waste management practices and in the portfolio records developed by the schools each year.

3.2 RESEARCH ORIENTATION

This research took the social critical approach as it critically examined learner participation in waste management practices.

It was also an interpretive research as it involved finding out and interpreting action competence within learner participation in waste management. Learners were probed on how they participated in waste management practices and why they did so as well as what was important to them about the knowledge they gained and their vision of better waste management.

The research was designed as a theory-seeking case study to examine learner agency using an action competence framework for interpretative analysis. Its intention was '*to contribute to theoretical frameworks which underpin both educational practice and policy*' (Bassey, 1999 p.13) in this case, learner action competence in waste management practices.

3.3 THE RESEARCH PROCESS

Research participants/ Sampling techniques

Two Grahamstown schools that have waste management as one of their Eco-School projects were selected. The **sample** of schools was thus purposeful and the study was undertaken as a collective case study. Denzin and Lincoln (2000 p.437) describe how a collective case study is *chosen to investigate a phenomena*, in my case action competence in relation to waste management. They note that this is done *because it allows for better understanding, perhaps better theorising, about a still larger collection of cases,* in this case waste management and action competence in southern African Eco-School contexts. The schools were Kingswood Junior and Grahamstown SDA Schools. Kingswood Junior School is a well-resourced Methodist School and Grahamstown SDA School is a church-funded state school in the Rhini Township, and most of their learners come from poor backgrounds. Children from Grahamstown SDA School come from homes where there are serious problems with waste. People illegally dump their waste near people's homes and children sometimes play with the

waste and this is a health hazard. Children from Kingswood Junior School come from the farm lands of the Eastern Cape as well as from other countries in Africa, Asia and Europe.

In each of the two cases I was allowed to interview Grade 4 and Grade 6 learners and they were aged between 9 and 12 years. The Eco-School teachers in the two schools chose learners who were interested to take part in this study in each grade. Children at Grahamstown SDA were shy to speak, especially Grade 4s. Some also struggled to express themselves in English. After the first round of interviews at Grahamstown SDA, I had a meeting with some critical friends and we decided to add more questions which dealth with learners' knowledge of waste issues and their vision for better waste management so I had to go back for a second round of focus group interviews with learners. In the second round of interviews, an *IsiXhosa* speaker accompanied me to act as an interpreter during the discussions so that learners were free to express themselves in their mother tongue if they so wished. Learners seemed more comfortable expressing themselves in their mother tongue.

Table 1: A Matrix of data collection and analysis methods

What?	Why?	Analysis
Interview with educators	To find out the approaches teachers use to foster learner participation.	Coding of data to construct categories that capture how the teachers are approaching environmental learning.
Take photographs and observational notes during interviews and discussions	Take photographs of any evidence of learner activities in environmental learning within waste management Eco-School activities.	Coding of relevant data (photographs and observational notes) to construct illustrative examples of interactions that characterise the learning practices.
Document analysis (Eco-School portfolio) and learners' work	To find out how the Eco-Schools portfolio reflects learner action competence. To find out any evidence of environmental learning in learner's work.	Coding of relevant data and constructing categories that capture different characteristics e.g. how the Eco-Schools file fosters action learning.
Focus group discussions with learners (FGDs)	To find out how learners participate in waste management practices and why, the knowledge they gain and their visions for better waste management.	Coding of the data generated into categories of how learners participate and the purposes they have in doing so, the knowledge they gain and their visions for better waste management.

3.4 RESEARCH METHODS

3.4.1 SEMI-STRUCTURED INTERVIEWS

Interview data was generated using semi-structured interviews with educators in the two schools to find out how the teachers and learners were involved in the programme (Who does what, why and how) as well as to generate data on contextual profiles of the two schools that took part in the research.

Interviews were useful in this research to get information that could not be observed, like how teachers and learners interpreted their involvement/participation in waste management practices. An interview schedule was developed and pilot interviews were conducted with other educators and peers to test the quality of interview questions.

Interviews with Eco-Schools teachers were practicable and essential since I only interviewed one teacher per school and therefore they did not take much time. As such, I was able to probe for clarity.

3.4.2 DOCUMENT ANALYSIS

Learners' work in the Eco-Schools portfolios was analysed as well as teachers' lesson plans to obtain more data to inform the research.

Document analysis was used to find out how the Eco-Schools portfolio reflects learner action competence. Secondly, documents were analysed to find out evidence of environmental learning in learner's work. Document analysis was essential in generating data that could not be observed.

3.4.3 FOCUS GROUP INTERVIEWS

Focus group interviews were chosen because they allow for a collective view on a subject (Cohen, Manion & Morrison, 2007, p.376). These were undertaken in two phases at Grahamstown SDA School with 10 Grade 4 learners, and 4 Grade 6 learners. This was because most of the Grade 6 learners had gone on an outing and there were only a few left. In the second phase, there were 11 Grade 4 learners and 9 Grade 6 learners who were part of the focus group discussions. At Kingswood Junior School, focus group discussions only took place in one phase. There were 9 Grade 4 learners and 11 Grade 6 learners who took part. These focus group discussions were administered between the period of August and September 2009 and each session lasted about 15 to 20 minutes. See Interview schedule in Appendix 3. Questions for these interviews were designed in such a way that it would allow for the generation of data that probed the aspects of action competence as proposed by Jensen and Schnack (2006) as discussed in Chapter 2.

These focus group interviews were undertaken to generate data on learner activities, purpose, insights and waste management practices. Initially, only Grade 4 learners were selected to take part in the discussions but after the first round of focus group discussions with Grade 4 learners at Grahamstown SDA School, learners were found to be at an age where they did not exercise much agency as their responses indicated that they still needed much more scaffolded support from their teachers. Learners were also shy to give their responses. But in an informal discussion with Grade 6 learners of the same school, learners showed evidence of much more learner-led autonomy and a decision was made to include Grade 6 learners as well. Both Grade 4 and Grade 6 learners in the schools that took part were involved in the waste management Eco-School activities.

A tape recorder was used during interviews after getting permission from the learners to use it and the information was transcribed, labelled and saved in different folders on a computer and an external hard drive. Transcribed data was taken back to interviewees to verify if their opinions were well represented **and member checking**. All raw data was stored in a safe place. A research journal was also used to record vital information during the focus group interviews where important dates, contact details as well as emerging thoughts and reflections throughout the research project were recorded.

Focus group interviews were essential in that they allowed for quite a lot of information to be generated in a short time, at the same time, I could probe for more information for clarity. However, I could only manage a small number of children so that I could guide the discussion without losing focus so I had to limit the number to 10 or less. The use of a tape recorder was appropriate because it saves time as opposed to taking notes and it also helps one not to lose vital information if one misses what the respondents said. However, it does take time to transcribe and analyse data compared to other methods like questionnaires, (Gillham, 2000).

3.4.4 OBSERVATIONAL (FIELD) NOTES

Observational notes were taken at the two schools during focus group interviews and photographs of what learners did with waste were also taken after the discussions (See Appendix 5). Photographs and observational notes were useful as they provided first-hand accounts of the situation.

3.5 VALIDITY

Different data sources allowed for a holistic interpretation and triangulation of data (for example a reading of data on purpose and agency across what learners say in focus groups, what teachers say in interviews and what is observed in the Eco-School portfolios) and served as a form of **validity** check. I already had some knowledge of these schools as I had worked with them on Eco-School support from the

Environmental Education and Sustainability Unit, at Rhodes University for two years. This knowledge helped me undertake the research as the teachers knew me and the unit were happy to work with us on the research. The study was thus undertaken as part of the Eco-School activities for the year but I none-the-less formally applied for permission to undertake the research. (See letters of consent in Appendix 2)

3.6 DATA ANALYSIS

Data generated in focus group interviews and semi-structured interviews was inductively coded (as discussed in the table 1 above) and then interpretatively **analysed** using the action competence framework to code for evidence of knowledge / insight purpose / vision action experience / capability. The coded data was extracted and written up into analytical memos so that evidence of action competence could be reported in analytical statements.

Learner focus group data were also analysed for agency by listening to their agentive speech in the way they communicated their experiences and spoke about what was important to them in their involvement in waste management practices. Mukute and Lotz-Sisitka (2009, p.1) argued that although it is difficult to observe, agency is a key process in change-oriented learning and in this analysis, learner experiences were analysed for optimistic talk and agency.

Observational notes and photographic evidence were gathered during interviews and discussions to verify and deepen evidence generated in the research. This included data from participants' own words and photographs which were included to support findings. (Merriam, 2001). Finally, I reviewed the Eco-School portfolio evidence of the process as this included learners' work. This research process gave me interview information, observation / photographic evidence and portfolio data on learner participation in waste management practices, all of which have been analysed to deepen our understanding of learner participation in Eco-School waste management activities (Q1) and how these were fostering active participation towards a learner-led agency (Q2 Action Competence).

3.7 ETHICAL CONSIDERATIONS

Permission was obtained from parents through teachers and from learners through obtaining informed consent from the school management. A detailed explanation of what the research was about was given to all parties involved through a letter that was given to them and they in turn responded positively that they wanted to be part of the research. Participants were told that they had the right to withdraw at any stage of the research process and this would have no negative consequences on them. The schools

also agreed to have their names published in the research. Photographs of learners and teachers used in data generation will not be published.

3.8 INVENTORY OF DATA GENERATED

Below is an inventory of all data that were generated through focus group interviews and semi-structured interviews;

Table 2 Inventory of data generated

Data item	Explanation	Code used
1	Focus group discussion with Grade 4 learners of Kingswood Junior School	KG4Lfg
2	Focus group discussion with Grade 6 learners of Kingswood Junior School	KG6Lfg
3	Focus group discussion with Grade 4 learners of Grahamstown SDA School	SDAG4Lfg
4	Focus group discussion with Grade 6 learners of Grahamstown SDA School	SDAG6Lfg
5	Interview with Eco-School coordinator of Kingswood Junior School	KTI
6	Interview with Eco-School coordinator of Grahamstown SDA School	SDATI

3.9 SUMMARY

This chapter has presented the research methodology, including the orientation that the research took, sampling techniques, methods of data generation and analysis as well as the validity and ethical considerations in the research process. It explained why different methods were used and different decisions were taken during the research process to achieve the desired aims of the research. At different stages, decisions had to be taken for example, a decision was made to engage an *IsiXhosa* interpreter to help learners who were not fluent in English.

CHAPTER 4
FINDINGS OF THE RESEARCH

4.1 INTRODUCTION

This chapter represents the data generated during the research process. The first part contextualises the two cases within which the research took place, followed by a report on the learning activities around waste management that took place in the two schools. Lastly, it presents what the learners said about the different aspects of action competence that emerged from the learning activities in the schools.

4.2 CASE 1 (KINGSWOOD JUNIOR SCHOOL)

4.2.1 Case context

Kingswood Junior School is part of Kingswood College which is a co-educational Methodist School in Grahamstown. The school is about one hundred and twenty years old. It caters for pupils from Grade 0 to Post-Matric level. It is a well-resourced school with beautiful grounds and excellent facilities like computers among others and is an international school where approximately 25% of the learners are from countries outside South Africa like Tanzania, Kenya, Botswana, Zambia, Ghana and Nigeria. They occasionally have pupils from countries like England, China and India. This means that the learners at this school form a multi-cultural and multi-lingual community and there is a richness in cultural diversity among learners. The junior school undertook the waste management project as an Eco-School in 2008/9. There are 270 learners and 15 teachers and a large percentage of the learners are boarders. Because of this fact, the school's curricular day is a very full one to cater for the boarders. A large number of the local learners are from the farming communities in the Eastern Cape of South Africa.

Kingswood has been involved with waste management as one of its Eco-Schools projects since 2007 and they have been flying an Eco-Schools green flag for three years. The Eco-school Coordinator leads the Eco-School activities by working with other teachers and making sure that different teachers contribute a lesson towards the school portfolio. When interviewed, the teacher said she decided to register her school as an Eco-School as she had some interest in the environment and she wanted to make

a difference in her school as well as in the lives of her learners and she described how it started, "*and then to see all the terrible mismanagement of waste was the main thing. So recycling seemed a good way to start because it would have an impact on the school but it would also impact on children...*" (KTI, p2). Here she noted that she saw large amounts of recyclable materials being thrown away and this to her felt wrong as this type of waste could have been easily recycled. She also described how they started the waste management programme "*That was one of our first projects and we got this very small recycling depot, we got bins for tins and glass and paper. And that's how we started, so then classrooms got separate paper bins only then. There had been talk about paper and what to do with it but there was nothing in place until then*", (KTI, p1)

Figure 1 Bin for other waste in Grade 4 class

Figure2 Bin for paper only in Grade 4 class

Children and parents were also asked to bring tins and glass for recycling, but the teacher reported it was mostly parents who brought these as the children themselves did not directly use many tins or much glass in the boarding establishment. The children did however collect one-sided re-usable paper out of which Grade 6s, now in Grade 7 would make pads which were delivered to schools that needed them. They would also pick up litter from the school's grounds.

Since the teacher worked more closely with Grade 6s than Grade 4s, she reported about some of the activities that Grade 6 learners were involved in. She said Grade 6s in the school made things out of recyclable waste, for example, they once made boats which they then sailed and raced at the school's swimming pool. They also made

other things from recyclable material. The teacher reported a number of activities on creative use of waste in fun activities and challenges for example one of the Grade 6 learners made a lamp and another who made a dust bin out of newspaper wrapped around. They brought them to school to demonstrate and explain how they made them to others and later they took them back home.

The teacher reported that the children at this school were not used to taking responsibility for managing their own waste as the school has outsourced cleaners, but she noted that, since the children understood the purpose of waste management, it was very easy to teach them and bring them on board, through constantly reminding them about waste management everyday at their line up and in chapel presentations at the school. She also noted that teachers would talk to them about the '*consequences of throwing things on the ground or not looking after their environment and the bigger picture of climate change and global warming*' (KTI, p2) and that the children were very easy to bring on board. The teacher reported that the children were responsible for the implementation of the waste management programme and that each class had a particular responsibility in the programme. She noted, "*The children were involved in ensuring that their classrooms had two bins, one for rubbish one for paper. They had to be responsible enough to put their paper in the right bin. On a Friday or whenever it needed to be done, the children take the paper down to the Ronnie recycling collection point. We've also collected in each classroom paper that can be re-used. One-sided re-usable paper. The children do that, ... the children pick up litter*" (KTI,p3). She claimed the Eco-Schools recycling programme also played a role in raising awareness of the learners and the learning took place in specific Grades at specific times. One challenge that they experienced was that although children made efforts to separate their waste for recycling, cleaners did not understand the purpose of separating waste so they sometimes just put all the waste together.

When asked to assess how the programme has been going, the teacher from Kingswood Junior School said that the children are very aware of waste issues and she gave an example where for five years when the school had a heritage day run and walk, children would throw away plastic water bags and that for the first time this

year, the children 'put them in tidy piles and there were even two or three Grade 5 boys who were going around picking up the ones that were just being left around lying around' (KTI,p4). So for the teacher, this meant that the children had now become conscious about these issues. The teacher said all this had been made possible also because the Headmaster of the school constantly reminds learners about waste issues. One area that the teacher would like to work on in the following year is to find ways of improving the children's learning in a setting where other people are employed to do the clean-up for the children. Another area that needs improvement according to the teacher is getting the whole school involved in organising waste management activities in the school because at the time of the study, she had to organise everything by herself.

At the time of the research, Kingswood Junior School was still continuing with their waste management project but they were not reporting their activities in the school's Eco-School portfolio because their project was undergoing some changes due to the introduction of a wider recycling system by the municipality in Grahamstown where residents could recycle in their own homes and put all recyclables in clear or orange bags. This meant that the school would not be getting any recyclables from children's homes. Because of this, the Eco-School portfolio information that was collected from the school was from when the school started their waste management project in 2007. The teacher said that each class teacher was responsible for their class so she said most of the work that learners did was in their portfolio. There was evidence of learner activities at Grade 4 level in the portfolio. From the school's Eco-Schools portfolio, learning activities that were done by Grade 4 and Grade 6 learners were looked at and there was evidence that learners were actively involved in the learning activities. For example, examples of recycling signs that were made by Grade 4 learners were included as well as photographs of children involved in different waste management learning activities like sorting plastic waste, collecting re-usable one-sided paper and turning it into paper pads, photographs showing separate bins for different waste and children eating their packed lunch while sitting on chairs made from recycled plastic.

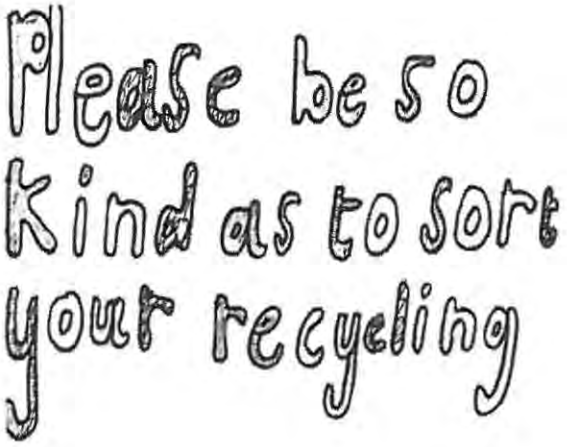

Figure 3 **Examples of recycling signs made by learners** **Figure 4**

In the Eco-School's portfolio, there was also evidence of learner's work as part of their learning about waste and the issues associated with them, for example, when Grade 4s were sorting their plastic waste, they counted and recorded how many of each type such as big yoghurt cups, see-through lids, sandwich and cake boxes and many more. See Appendix 5 for examples of learners' work and photographs of learners' activities with waste.

4.2.2 Waste management activities

Data on waste management activities that learners were involved in were generated through interviews with teachers (KTI), observations through taking photographs (P), document analysis of Eco-School Portfolios (ES Portfolio) and focus group discussions with learners in Grade 4 (KG4Lfg) and Grade 6 (KG6Lfg).

4.2.3 Waste management practices

Reading through the data generated from focus group interviews, teacher semi-structured interviews and Eco-School portfolios, the following list of waste management activities in the school was compiled;

Table 3 Waste management practices in the school

Activity	All	G4	G 6
1. Separating and sorting waste, have bins for tins, glass & paper in classrooms then all waste is taken to the recycling depot (KG4 Lfg, p1) and (KG6 Lfg, p1, p3).	✓		
2. Learners went around and collected paper bins on a Friday and collected paper from the photo stat room to the collection point (KTI, p2).		✓	
3. Recycling waste – creative use of waste e.g. making jewellery, handbags, pigs, rugby balls, dolls, (KG4 Lfg, p1, p3, p4, p5) pencil holders (KG6 Lfg, p3) and boats (Grade 6s) (KTI, p3).	✓		
4. Class competition to see how much paper each class can collect (KG6 Lfg, p2).	✓		
5. Children had to ensure their classroom had 2 bins, one for rubbish and one for paper (KTI, p3).	✓		
6. Learning about the consequences of throwing things on the ground and the bigger picture of climate change and global warming (KTI, p2).	✓		
7. Learning about recycling in EMS class (KTI, p3).	✓		
8. Parents brought waste from home.	✓		
9. Learners made recycling signs for classroom bins (KG4 Lfg, p6), Eco-Schools portfolio.		✓	
10. Sorting plastic waste K – ES portfolio.		✓	
11. Counting plastic waste K – ES portfolio.		✓	
12. Collecting re-usable one-sided paper to be turned into paper pads KTI, p3.	✓		
13. Picking up of litter (KG6 Lfg, p5).	✓		
14. Learning about waste at museums (KG4 Lfg, p2).		✓	

4.2.4 Learner narratives

As noted in Chapter 3, the evidence of learner engagement was generated through focus group interviews. These were undertaken as an unfolding conversation to represent learner knowledge, their vision and commitment and their sense of the Eco-School recycling programme action experiences that were significant to them. Having the learners represent their knowledge and experiences in these small group sessions

allowed me to read the evidence of learner involvement in the context of the school. My main research interest was to probe what activities were undertaken as well as the extent to which there was learner buy in and things that were initiated by them. Representing learner knowledge, vision/commitment and action experiences was important for the analysis of evidence of action competence that follows in Chapter 5. This was the most interesting part of the study because I was interviewing the learners and listening to their experiences against activities undertaken in the school.

Embedded in the discussion was what was significant to them (learners) and reflecting on what they thought was most important in the waste management initiatives. During these discussions, pictures and sometimes observational notes were taken when learners were showing and telling of what they did with waste (See Appendix 5).

4.2.5 Grade 4 learner focus group discussion on learning better waste management practices

On the day of the focus group discussion with Grade 4 learners at this school, learners were excited about being asked to talk about their involvement in waste management activities in the school and they spoke freely about their action experiences. Their level of excitement was evidenced in that one of the learners offered to take photographs while we were having the discussion, while other learners rose from their seats during the discussion to go and get some of the things that they had made as part of their recycling activities so that they could show me. Also, some learners became very interested in what they discussed that they tended to dominate the discussion so that from time to time I had to come in and encourage other learners to participate.

Whenever children were asked what they knew or what they were learning about waste, they spoke about what was significant to them i.e. their action activities around waste in the school and at home. During the discussion, children said they learn how to separate waste for example, putting garbage in one bin, paper in another and then tins and glass in a separate bin (KG4 Lfg, p1). The recyclable material then gets taken to the environment committee. They described how the different bins for different types of waste are placed in each classroom and how these were labelled by the learners. They also reported that they used some of the waste that they had collected to

make creative recycled products like jewellery from chip packets, a rugby ball from a 2-litre bottle, pigs from balloons and papier-mâché, handbags, toys and dolls from used bottles, paper, newspaper and egg boxes which they showed me during the discussion. I took photographs of some of them. Some of the children reported that they also even separate their waste at home and they have different bins for different waste at home as well. One learner also said he bought a toy car made from recycled material. Here we can see that learners are actively engaged in some sustainable actions towards managing waste and reducing it. Learners reported that they learn about waste at school and sometimes at museums (KG4 Lfg, p1, p2)

Other activities that learners said they were involved in were like making sure their classrooms are tidy and even cleaning up for others if they are not there and telling people not to waste paper. They explained to them that wasting paper means that more trees will be cut to make new paper and that trees should not to be cut as they are important in people's lives. Here learners are consciously taking responsibility to make sure that their surroundings are clean and are also extending their agency to others by encouraging them to take responsibility for their waste.

In order to find out what learners knew about waste that would lead to informed action I asked them how the environment and people can be affected if people do not manage their waste properly. I also asked them what they thought were the root causes of problems related to waste and how they could be solved. Learners said they knew that they should not throw their rubbish outside but that they must throw it in the bin and that if they see any litter then they must pick it up. Learners also explained how they made some of the materials from waste like one learner explained like this '*you can do what we did there (pointing to the dolls made from recycled material) you just take a bottle, and you just take scrap paper or newspaper, and then take some glue and then you just go on around the bottle, and then you just keep on going until you get up head, and then when you, you know the egg things what the eggs come in? You just like when you're done with the egg or something, you just break that off and you can put it like as a nose (the egg box). And then you can paint them for all kinds of things you want to make'* (KG4 Lfg, p3).

On what they knew about the consequences of not managing waste properly, learners said if we leave waste lying around, animals can eat it and they can choke and die. One learner also said another effect is that it can 'destroy our environment' because it can get stuck in water pipes and make our water dirty and he said dirty water is bad for us. Another learner explained what might happen by giving an example of what could happen like this "*like if you take a packet of chips and say you've eaten and just throw it on the floor, imagine a bird flying and thinking that's food for it, it's a starving bird, then it eats and then it just dies*" learners also spoke about the dangers of not managing our waste by explaining how when we waste paper it will mean that more trees will be cut to make new paper. Instead, they say we must use recycled paper to save trees. The learner further explained that by saving trees you are saving people's lives since trees give oxygen to people and that 'one person needs sixteen trees so if you chop down a tree you chop down someone's life too', (KG4 Lfg, p2). Here, there was evidence of learning how to practice waste management as well as how to make things out of waste. However, there was not much evidence of learning about the relationships between waste and nature in the broader sense and how it is linked to climate change and global warming although learners said that it can destroy the environment.

Learners also reported how waste management activities in their school are carried out and why they take part in the activities. Learners said that sometimes teachers decide what needs to be done regarding waste management in the school and sometimes the children come up with ideas of what they could do and they share their ideas with the Eco-Schools coordinator within the school. As for reasons why they are involved in waste management activities, learners said it is because they think it can help the environment through saving trees for example, and in the process saving people's lives because they need trees to produce oxygen for them to breathe. Other learners said they get involved because they can help people who 'don't have all these wonderful things that we do have' (KG4Lfg, p5) referring to their involvement in making creative waste products.

Learners were also asked what they envisioned as better practices of managing their waste and they spoke of how they want their country to be an example of a place where waste is managed properly so that when visitors come they would see how clean it is and go back to their countries and make their countries clean also. Another learner said he wants to see a change in the way people cut trees and he does not like seeing trees being cut, and he also said he wants to see more animals. Some learners said they would like to see a 'green' world that has no litter and that if people see litter in the streets they must not walk past it but pick it up and keep it in their pockets until when they see a bin and if people would like to help the poor then they need to think of what they can make out of waste for the poor instead of throwing it away.

4.2.6 Grade 6 learners' focus group discussion on learning better waste management practices

Focus group interviews with Grade 6 learners at Kingswood Junior School took place on the same day as the Grade 4s. However, the Grade 6 teacher was present throughout the discussion and she briefly took part in the discussions but only the learners' responses will be presented here. Just like the Grade 4s, Grade 6 learners were very enthusiastic about being asked to share their waste management practices.

When asked what they learn about waste management, like the Grade 4s, Grade 6 learners also talked about waste management activities that they do and they reported that they learn how to recycle paper. They went further to explain how they do it "*well, after we get our paper and we've got two separate bins there, one says paper only and then down there we've got a recycle bin ... and then we've also got glass, tins, plastic*" (KG6Lfg, p1). Learners explained that after collecting all recyclable material like glass, tins and plastic, a big truck comes to the school to pick it up and it goes to a factory. They also said that sometimes their teachers ask them to bring specific recyclable items that they can turn into new things for a particular function as one learner elaborated "*I think also Mrs (name of Eco-Schools coordinator) has asked us to collect plastic, cans and things. When they had this function they took cans and they made them into mugs. They asked us to bring cans for the function*" (KG6Lfg, p3). One learner explained how they use waste creatively to make new things, "*like*

pencil holders, you take a mug and you decorate it outside and you put it as a pencil holder" (KG6Lfg, p3).

Class competitions were also one way that helped the school collect a lot of recyclable material like waste paper. They had to bring all their waste paper as a class and the class that brought most paper won. "*We had that big competition to see how much paper from each class, how much we would collect*" (KG6Lfg, p2).

Picking up of litter was also another waste management activity that the learners reported about. They said their class teacher tells them to pick up litter at the end of their lessons "*like for 10 minutes before we end a lesson, she like normally says 'collect 10 for yourself and when you finish put it in the bin*" (KG6Lfg, p5).

A number of the learners also reported that apart from being involved in waste management activities at school, they were also involved in managing their waste at home. One learner explained how he does it at home "*we instead of... if we print out papers that we've typed on but we don't need them, we always keep them in a separate row for in case we type, like cut things out or when my sister colours in a lot. So we keep those for her*" (KG6Lfg, p1). Another learner explained how they started managing their waste at home "*at my house, my parents used to throw all of the stuff that we could recycle away, and then my nanny, because she does some environmental stuff am not sure, she started, she got another bin and started making us put stuff that we could re-use in there*" (KG6Lfg, p4).

Grade 6 learners also reported that normally they are prepared so that they can become involved in the environment committee if they would like to when they reach Grade 7. The environment committee at Kingswood Junior is comprised of Grade 7 learners who have volunteered to get involved in managing environmental activities in the school as a Grade 6 learner reported;

> *they normally prepare us for next year, like, because next year there's like, at the chapel service he said that, he put a letter down that said we could write ou.r name down if we want to be considered for the chapel services and environmental committee and service committee, but Grade 6s are allowed to write down because most of the Grade 7's next year they'll probably be, half of them or more will be going to the*

senior school, so they won't be able to do it. So he mostly said Grade 6s to do it, so that's what we're doing", (KG6Lfg, p4).

The Grade 6 learners said they learn about waste management through the schools' environment committee, their teachers in class and also from home, (KG6Lfg, p1). In order to find out learners' knowledge about issues related to waste management, learners were asked what they felt were problems associated with poor waste disposal. In response, one learner spoke about the problem of sewage and waste water and how it can lead to the spread of diseases. The learner also linked it to what the learners were told at the school's chapel about how earthquakes in some parts of the world have led to the contamination of bodies of water "*with sewage and waste water going through our water supplies it's spreading diseases, and some of them are deadly, and then during chapel this morning our rep told us about all the earth quakes, and people that died and all their bodies are decomposing in water*" (KG6Lfg, p2).

Another learner spoke about how the environment is affected by throwing rubbish in the dumping places, "well, when the rubbish trucks, when they pick up rubbish they just dump it in the rubbish yard or whatever, and that makes the area around it not, well it sort of, it makes it ugly and it can pollute the water", (KG6Lfg, p2).

Learners also shared what they experienced in their school the year before, when a tornado blew away their unsorted waste and roof and messed up their street as a number of them recalled, "*we had a tornado here*", ... "*last year during second term*",... "*Yea, it took our club house's roof off and it messed up our street*" (KG6Lfg, p2). Here, learners were trying to show the effects of not managing waste through sharing their lived experiences.

To find out learners' knowledge of what can be done to solve problems associated with waste, learners reported of actions like recycling our waste and stop cutting down trees and another learner went further to say that "*instead of using paper to write on, they could come up with electronic books which will be more environmentally friendly*", (KG6Lfg, p3).

Learners also reported that in their science lesson, they learnt about water pollution and waste water/oils. They also said that it is important to manage and recycle our waste because if we do not then it may lead to pollution. One learner explained "*well, it's like if you won't start picking up litter now, by the time we come to the 21st century, I don't think there will be any humans left*", (KG6Lfg, p4).

To find out learners' reported commitment in relation to waste management, learners were asked how they found out about waste and recycling, why they decided to get involved in the practice and who decided on what needed to be done in their waste management programme. Learners reported that they heard about this through the school's environment committee and through the Eco-School's coordinator and their teachers, (KG6Lfg, p2). One learner however said that he learnt about it through watching a film that was given to him by his parents as he reported "*well I learnt about it by, well, my mum and dad they bought a film 'The Inconvenient Truth', have you heard of it*", (KG6Lfg, p1).

When asked why they decided to get involved in managing their waste, learners gave various reasons for it. One learner reported about how he decided to get involved in managing and recycling waste by explaining what used to happen before waste management was introduced in the school;

> *because, the environment, before we didn't like want to clean up, and then the school started getting messy, so like, like mostly everywhere you go you would find cans and rubbish just lying around next to the door, so like even though there were bins but the whole bin was just full of rubbish then the school principal didn't like the mess around so she told us to like try and pick up litter as and when we see it. Even if there's no dust bin around we've to pick it up and hold it and when we find a dust bin then we put it*" (KG6Lfg, p5).

Another learner explained "*and also that we're becoming aware that the atmosphere is warming up, with all the fumes it's warming up*", (KG6Lfg, p5).

Learners also spoke about why they decided to get involved by explaining that it was important as helped to save the environment. One learner explained, "*Well, I started because it's important to let people know because otherwise, we're going to destroy the planet and we won't be able to live on it anymore*", (KG6Lfg, p5).

However, one learner said that he decided to get involved because he did research and what he found out from his research made him decide to get involved as he explained "*I started it because I researched about global warming, and they said that there might not be life. There might be like half the Antarctica or something left in fifty years*", (KG6Lfg, p5).

Learners reported that the Eco-Schools' Coordinator and their teachers mostly decide on what needs to be done in their waste management programme but added that sometimes the learners decide because sometimes the teachers are busy. (KG6Lfg, p7). They reported that sometimes the Eco-School's coordinator asks them to bring specific types of waste like cans that she may want to use for other purposes. Learners said sometimes they decide to pick up waste and they ask their teachers where they must put it. (KG6Lfg, p7).

In order to find our learners' reported vision on better waste management, learners were asked what they would like to see happening as a result of their participation. One learner said he would like to see people acting when things are going wrong as he explained, "*I would like to see maybe if say, they ate a sweet and they put the wrapper in their pockets, and if it fell out then there would be a friend, and the friend noticed like they let them know that it fell out*", (KG6Lfg, p6).

Another learner reported that he would like to see people shut down factories that pollute the air and that people should stop cutting down trees. And another learner spoke about waste management problems associated with alcohol because when people get drunk they become irresponsible, and they then just throw away the beer bottles anywhere and this might cause accidents, so he said he would like to see alcohol companies shut down. (KG6Lfg, p6).

Another learner said he would like to see people making an effort to have clean streets even if they are not responsible for dirty streets and he explained, "*I would like to see more people picking up litter in the streets, because a lot of people just walk past it. And if everyone just like picks up like one piece of litter it would make a great difference*" (KG6Lfg, p7).

Reading through the learner narratives, I can make the following summary about the aspects of action competence;

Table 4 Evidence of aspects of Action Competence

Reported actions on waste management	Learners are taking responsibility for their waste by cleaning up and tidying their surroundings and extending their agency to others by encouraging them to take responsibility for their waste; Class competitions are a way of involving learners in taking waste management actions Learners are managing their waste also at home; Learners are being prepared to be environmental leaders when they go into senior classes;
Reported knowledge of waste management	Learners are learning how to practise waste management and how to recycle; Learners are learning about the importance of managing waste and the dangers of not doing it, but this is only very superficial; Learners are mostly trying out creative use of waste rather than finding out more about waste; Learners are able to make connections between what they learn in class and their lived experiences e.g., tornado story; Learners know how to solve waste problems;
Reported commitment on better waste management	Learners sometimes decide what needs to be done but mostly teachers and Eco-Schools coordinator decide or guide; Learners get involved because they think managing waste can help the environment, because they can help people who don't have; Learners recycle materials for fun and also as part of design technology learning; Learners learn about waste through the environment committee, teachers and from home; Learners learn about waste through Eco-Schools and through watching a movie; Learners decided to manage their waste to improve the appearance of their school, before it used to look dirty, because they are becoming aware of global warming/researched global warming, and because it saves the environment;
Reported vision for better waste management	Learners want to take pride in having a clean country that others can learn from; Learners want to see a change in people's behaviour ; Learners want people acting when things go wrong and taking responsibility for their waste and they want to see polluting companies close;
Other	Evidence of change practices, before children used to throw their litter everywhere at the heritage run and walk, this year "they put them in tidy piles".

4.3 Case 2 Grahamstown S.D.A. (Seventh Day Adventist) School

4.3.1 Case context

Grahamstown SDA School has recently relocated to Fingo Village, Joza Township, one and a half kilometres East of Grahamstown it was officially opened on the 21st January 1942 by a Mrs Mayaba as a one-teacher school, (Eco-School Portfolio, 2009). It started with 18 learners from Sub A to Standard 2 and the Grahamstown S.D.A. Church members at that time paid the teacher's salary while various organisations donated buildings. Currently the school is largely dependent on government subsidy for staff salaries but remains a Christian Church-governed school. It offers education from Grade 1 to 7 and due to increasing unemployment rates in Grahamstown, most of the learners are from poor backgrounds and sometimes parents are not able to pay their children's fees, (Eco-School Portfolio, 2009). As a result, the school is not well resourced and experiences staff shortages. Learners come from the surrounding areas of Grahamstown, up to a radius of 60 km but they also get learners from as far as Umtata, King Williamstown, Queenstown, Uitenhage, Port Elizabeth, Pretoria, Alice, Peddie and Johannesburg who have relatives in Grahamstown. The school has no boarding facilities.

The townships where learners come from are affected by violence, community noise pollution, waste pollution and economic hardships (Eco-School Portfolio, 2009). The school implements feeding schemes for learners.

As a Christian school, they make sure that all learners have a full understanding of Christianity apart from maintaining the government curriculum. Christian values are also respected in the school. The school gets support from St Andrews College for its extra mural activities like technology, sports, needlework and computer literacy and soon they will be getting support in swimming and environmental studies from the same college (Eco-School Portfolio, 2009).

The school has been an Eco-School for 4 years and all teachers are involved in the activities, but three of them coordinate activities and attend workshops at Rhodes University (Personal communication with teacher, 18th September, 2009). The school has a lot of space outside and therefore they have a number of vegetable gardens and

have planted some flowers. They also have three rain water collection tanks which were donated to them as tap water is very expensive for watering plants.

Figure 6 The school has 2 water collection tanks

Figure 7 Picture frames from recycled material

Figure 8 compost heap at the school

Teachers use the school grounds for environmental learning and offer learners practical experience of what is taught in class through learning by doing, (Personal communication with teacher, 18th September, 2009). They also have an environmental club, which is separate from Eco-Schools. The school principal phones people to bring recyclable waste e.g. paper used on one side only, tyres, leaves, etc from places like Rhodes University and then learners sort it out and use it. They use the tyres for planting, leaves for composting and other waste to make things like picture frames (Personal communication with teacher, 18th September, 2009). Learners are involved in recycling of plastics and paper and they make things like hats, mats and paper envelopes which they sell and earn money (Personal communication with Grade 6 learners, 18th September, 2009). They also throw all their fruit and vegetable waste in the school's compost heap. When the compost is ready, they would like to conduct experiments using compost from the compost heap, using cow dung compost and using worms (Chiphwanya, notes from Eco-School meeting, 18th August 2009). Learners also collect and sort plastic bottles for the plastic recycling company, but they sometimes use the bottles in art to make things like flower vases for the school. They re-use paper plates and polystyrene trays to make picture frames (Chiphwanya, notes from Eco-School meeting, 18th August 2009). The school also gets support from the Department of Education, Department of Agriculture and community-based organisations like Umthathi Training Project who gave them equipment like gardening forks, wheelbarrows and some watering cans (N. Chiphwanya, notes from Eco-School meeting, 18th August 2009).

4.3.2 Waste management practices

Data on waste management activities that learners were involved in were generated through interviews with teachers (SDATI), observations through taking photographs (P), document analysis of Eco-School Portfolios (ES Portfolio) and minutes from Eco-School meeting at the school as well as focus group discussions with learners in Grade 4 (SDAG4Lfg) and Grade 6 (SDAG6Lfg).

4.3.3 Waste management practices

Reading through the data generated from focus group interviews, teacher semi-structured interviews and Eco-School portfolios, the following list of waste management activities in the school was compiled;

Table 5 Waste management practices in the school

Activity	All	G4	G 6
Collection of waste materials from other places like Rhodes University for recycling. (Personal communication with teacher, 18th September, 2009).	✓		
Recycling of plastics, paper, cardboard, tyres, tins etc to make things like hats, mats, pencil holders, envelopes etc. (Personal communication with teacher and Grade 6 learners, 18th September, 2009), (SDAG4Lfg, Int2p2 ,p3), (SDAG6Lfg,Int1p1), and (SDAG6Lfg,Int2p5,p6)	✓		
Collect chip packets to make picture frames (SDAG4Lfg,Int2p3) (SDAG6Lfg,Int2p5,p6)	✓		
Bring used buckets (pails) to school for planting seeds (SDAG4Lfg,Int1p1), (SDAG6Lfg,Int1p1)	✓		
Pick up papers for re-use or burn them SDAG4Lfg,Int2p1)		✓	
Tell others about waste management (SDAG4Lfg,Int2p3) (SDAG6Lfg,Int2p4,p5)	✓		
Recycle at home and make own toys and picture frames (SDAG4Lfg,Int2p5, p7)		✓	
Collect vegetable peels at home for composting in own garden (SDAG6Lfg,Int2,p6, p7)			✓
Cleans house at home after school (SDAG4Lfg,Int2p7)		✓	
Cutting shapes from used cardboard in class (SDAG4Lfg,Int2p8)		✓	
Ask *Grocott's Mail* for old newspaper or anyone who doesn't need them to make paper bags (SDAG6Lfg,Int1p1,p2)			✓
Sell products made out of recycled material (SDAG6Lfg,Int1p3,p4,p5)			✓
Have a compost heap at school and they throw their biodegradable waste there. (notes from Eco-Schools meeting, 18th August 2009, research diary)	✓		

4.3.4 Learner narratives

As in case 1, evidence of learner engagement was generated through focus group interviews that were undertaken to represent learner knowledge, their vision and commitment and their sense of the Eco-School recycling programme action experiences that was significant to them. Through these interviews I was able to read the evidence of learner involvement in the context of the school and to probe what activities were undertaken as well as the extent to which there was learner buy-in and ideas that were initiated by them.

4.3.5 Grade 4 learner focus group discussion on learning better waste management practices

As explained in Chapter 3, focus group interview data on Grade 4 learner involvement in waste management practices at Grahamstown SDA School was generated through two separate interviews. The first interview with Grade 4s (SDAG4Lfg,Int1) and the second interview with Grade 4s (SDAG4Lfg,Int2).

During the first focus group interview with Grade 4 learners, some of them were shy and were not confident in giving their answers. There were a few however, who participated with enthusiasm throughout the discussion. In the second interview, although learners became more confident and freely expressed themselves in their mother tongue (*IsiXhosa)* since there was an interpreter to translate, there were a number of times when learners just remained silent after being asked a question in English which was then translated into *IsiXhosa*. Those who felt confident to speak in English were allowed to use English. Learners mostly gave short answers and to get a clear picture of what they talked about, more probing had to be done.

When learners were asked what they do regarding waste management they reported that they bring used pails/buckets that they do not need at home and they use them to plant plants at school "*We get it from our homes. When we don't need them we bring them to school*", ... "*we use the buckets to mh... we use them for the plants. We take them to the garden, then we use them for the plants. We put plants in them*" (SDAG4Lfg,Int1,p1). They also said that they use the buckets for composting.

Learners also reported that they pick up papers and they put them in the bin, or they burn them. And that they collect chip packets which they use in their art class, "*Here in our school, when we are doing art some people pick the chip packets and they cut them into pieces and they put them in their art*" (SDAG4Lfg,Int2,p3).

One Grade 4 learner reported that he tells others at home about waste management, "*For example when I play with my friends, when I play rope in my area, the others take the chips papers and they throw them away and I say to them 'no, don't throw the papers away, throw them in the bins or burn them",* (SDAG4Lfg,Int2,p3).

A number of the learners also reported of waste management activities at home, for example recycling and making toys out of used material, cleaning their home, and making picture frames out of used material as one of them reported, "*I recycle at home. Sometimes I make toys of my own, ... I use paper or cardboard,... Sometimes I watch on the TV how to make it*", (SDAG4Lfg,Int2,p5).

On reported knowledge of waste management, learners said that it is important for them to manage their waste and re-use things like buckets that they bring from home because they do not want to throw away things that they can use again. They explained, "*Because if we throw those things, sometime later we can want those things and we can't find them again*", (SDAG4Lfg,Int1,p1). Learners also noted that if they did not manage their waste properly then their school would look terrible, their garden would be full of papers and that animals and plants will die "*because the world is dirty*", and that they themselves would be sick (SDAG4Lfg,Int2,p2). Learners therefore said that it is important to manage their waste because they need a place to play and to build their houses so they do not want to stay in a dirty place, and because waste "causes accidents". They also noted that to do this, they have to pick up papers and recycle them, make things out of them as in art, and tell others not to throw things away. They reported that when they pick up papers, the area they live in looks clean and also "the whole environment" (SDAG4Lfg,Int2,p6).

Learner agency and empowerment was also probed through asking learners why they were involved in waste management activities and how they practiced waste

management at school and/or at home. Learners were also asked about who decides what needed to be done in order to find out to what extent their activities were learner-led or teacher-led. I probed for evidence of purposeful learning and purposeful engagement and if learner involvement was self-initiated/learner-led. Grade 4 learners at Grahamstown SDA reported that their whole class was involved in bringing used buckets from home for re-use and that their teachers told them to do so. One of the learners reported, "*Our teacher told us, ... er.. not to throw the buckets away. We should save them to make our plants*" (SDAG4Lfg,Int1,p1). Learners said that it is important for them to bring used buckets from home so that they can plant flowers in them and make their school look clean. They also noted that the reason why they manage their waste is so that they do not live in a dirty environment (SDAG4Lfg,Int2,p4).

One learner noted that he makes toys from used materials for his use at home because sometimes he gets bored at home and his parents do not have money to buy him toys. He said sometimes he watches on television how to make toys out of used materials (SDAG4Lfg,Int2,p6). This learner also noted that sometimes he picks up papers from his vegetable garden at home and another learner reported that it is important for them to have a garden at home since food prices keep rising and she explained, "*It helps us to make a garden because the price of food goes up day by day and then it helps us if we want vegetables we just go to the garden and pick the vegetables*" (SDAG4Lfg,Int2,p6).

According to the learners, it is the teachers who decided what needed to be done, for example learners reported that their teacher told them to clean their school (SDAG4Lfg,Int2,p5). They also reported that sometimes their teacher helped them, for example in the garden and that sometimes learners decided what needed to be done (SDAG4Lfg,Int2,p7).

Grade 4 learners did not have much to say about their vision for better waste management. Only one of them noted that he would like to see people "*pick up their papers in their areas*" (SDAG4Lfg,Int2,p6).

4.3.6 Grade 6 learner focus group discussions on learning better waste management practices

Focus group interviews with Grade 6 learners at Grahamstown SDA School were more vibrant than those with Grade 4 learners of the same school and almost all of the learners participated in the discussions although some of them seemed to dominate the discussion. As with the Grade 4 interviews, Grade 6 interviews were conducted in two separate sessions and in the second session an *IsiXhosa* interpreter was present so that learners would feel free to express themselves in their mother tongue.

When learners were asked what they were learning about waste at school they reported that they learnt that they can recycle and make things out of waste. They felt proud to show me items that they had made from waste such as hats made from crocheted plastic. They even put them on and asked me to take photographs of them wearing them. They further explained that they learnt to make other things like envelopes and paper bags from used paper (SDAG6Lfg,Int1,p1).

Learners reported how they collect waste materials and use them at school to make creative products out of them and they explained, "*we get the paper from the rubbish that people they were dumping there, in the dumping area*", and they also spoke about how they collect used material like newspapers from other places, "*from someone who bought them, but then some days they come and give us those papers for recycling, maybe those who sell them. We just ask them and then they give us, and then we make i-paper bags*" (SDAG6Lfg,Int1,p2). They reported that some of the places where they collect old newspapers were like the *Grocott's Mail* offices. They explained how they made their creative products from waste, "*You just do like you're doing the braids*" (SDAG6Lfg,Int1,p2).

Learners reported that they also made these creative products from waste so that they could sell them as they explained, "*We can sell them or make some things out of plastics. And some people like them and then we sell them so we get money*" (SDAG6Lfg,Int1,p3). They also explained how learning about using waste creatively makes their parents happy and encourages parents to continue giving their children

some waste material to use at home, *"they are comforted and we give them courage so that they can give us every day that we need it and then they become happy because there's something that we're gaining in them because if they are correct we can sell them"* (SDAG6Lfg,Int1,p2).

Grade 6 learners also reported that they bring used pails from their homes and they use them in their garden (SDAG6Lfg,Int2,p1).

Learners reported that they believe that if you are taught a skill you must not keep it to yourself if it may be useful to others as well. So they teach others what they are taught and they explained, "*We teach others, like if maybe you've something that you know, and that it's like it's your gift, someone can know how to do it like crocheting or knitting or whatever that can help someone. You can teach someone and that grows and it makes something that is better than what it was before"* (SDAG6Lfg,Int2,p4). They also said that they teach others about waste and had a march where they told people about waste for example. Learners recalled one such even that they had the previous year, "*It was last year when we did a march telling people to pick up waste, ... I think it was another day that we went to the streets to tell them about things that maybe they didn't know and we were reading books to them, a book like 'river ...' and maybe that book had something and then you explain it to someone and show them what the point is in the book, and if it was a book about rubbish, the point would be that they must not throw papers because papers cause this and that and that. So they can see why you're saying they must stop throwing papers*" (SDAG6Lfg,Int2,p5).

Learners also said that they make pencil holders from used tins, "*We pick up tins and then we take the cover of a book, then we tear them into pieces, and then we paste them onto the tins, and then we make something where you can put maybe your crayons inside it*" (SDAG6Lfg,Int2,p5). They also said that they collect packets of chips and they use them to decorate picture frames which they make out of used polystyrene trays or macaroni packets.

A number of the Grade 6 learners also described waste management activities that they are involved with at home for example, belonging to a community group that

picks up rubbish to help clean up their area (SDAG6Lfg,Int2,p5), and collecting vegetable waste for composting which they use in their own vegetable garden at home, "*Me at my home when my mum is cooking vegetables, I take all the pillars (*peels*) and put them in my garden"* (SDAG6Lfg,Int2,p6).

Learners mostly reported that they were learning about doing business through making creative waste products and that it was linked to a topic that they had in Economic Management Science in the curriculum. One learner recalled how their teacher explained to them that the things that they made were not to be found anywhere else so they could make the products and sell them and people could buy them, "*when I still remember she told us that in the modern days we couldn't buy them so we can take in the dumping area. We just do them. When we are finished we can go sell them as that thing that was made out of cardboard, made by* (... name of learner)" (SDAG6Lfg,Int1,p3). Another learner reported that they learn that by making products out of waste, they only make profits as they do not spend anything on the materials they use since they get them for free, *"... because we don't buy anything. We just take from home or from the dumping area. And then from the dumping area you make your own thing and then you sell it and you gain some money. And with that money, you keep it to yourself. You don't take that money and go buy, you just collect there in the area*" (SDAG6Lfg,Int1,p3).

When asked about their knowledge about waste, learners did not show much evidence of this and this is what they reported when asked to say what they were learning about waste and recycling, "*and we must not destroy our nature. Zintu like plants and trees. We must not destroy them because we get energy from the tree*", and another one noted, "*it's waste because when we get them for nothing and we leave the important things and take just the common things because if you cut the trees you're destroying life because we get more things from the tree. Even the furniture"* (SDAG6Lfg,Int1,p3,p4). Even when they were asked how their activities of recycling are helping the environment learners did not show much evidence of a clear grasp of waste issues as some of the answers were like, "*I think in difficult times when you have no money you can sell it and then you have some money. Even if you don't have*

clothes, hats, somehow you can crochet them or knit them so that you can have something as just as this cap. This cap someone knitted it and then sold it to someone and gained money" (SDAG6Lfg,Int1,p4). One learner who showed some evidence of knowledge about waste issues said, "*to clean the environment it's like you collect the paper that's around. It cleans, and then after that someone using it correctly, and then it's not like the same because maybe it was something to read and then you just throw it but we take it and do something new so that you can have something because paper bags we go with them to town and then they carry something instead of buying plastic because plastics now you're buying them with money*" (SDAG6Lfg,Int1,p4).

Learners also said that it was important for them to manage their waste because the skills they gain are useful to them considering that their parents are poor, "*as you know that poverty, it's a big problem, so we can come to school and learn how to make a garden*" (SDAG6Lfg,Int2,p9). Learners also noted that it was important for them to manage their waste to make their parents proud of them and because it makes the world clean, (SDAG6Lfg,Int2,p10). And another learner said that at the Museum they learn that we get paper from trees and that they can turn paper into new paper (SDAG6Lfg,Int2,p9).

When asked what sort of problems we can get when we are not managing our waste properly, learners said learners can get sick and that if they do not bring their vegetable waste from home for their compost heap then their vegetables will not grow (SDAG6Lfg,Int2,p2). But when asked how waste can make people get sick learners were not able to explain clearly as one of them noted, "*It's when papers fly to us and then we inhale them and then after that there is something that gets wrong inside our body and we get sick*" (SDAG6Lfg,Int2,p2). When asked how waste can affect our environment, learners explained that it can affect people and make them sick if we just dump our waste in the streets as one of them noted, "*It's like our other environments it's like we are the same. If I get sick by the same problem, if that problem is there to the environment and then those people who are staying in that environment can be affected too in the environment just like we live there. And our garbage that we dump in there may be in front of the house, people from that house or the people who live in*

the street can be affected by the garbage that is there and then they inhale it and then they can get sick" (SDAG6Lfg,Int2,p3). Learners also noted that if we throw waste in our environment for a long time without cleaning it then it accumulates germs, "*It affects it in this way, if we throw away papers, not today but every day and then the papers grow bigger and bigger, and then it affects the whole environment because the germs will be coming out of the paper to the other places*" (SDAG6Lfg,Int2,p3). Learners noted that the root cause of waste problems is that people do not care as they just throw their waste anywhere thinking "*it's not me who's going to get sick, it's them*" (SDAG6Lfg,Int2,p3). To solve these problems, learners said we must pick up papers and clean up places, as well as recycle and make new things out of them. learners also noted that we can solve these problems through "*education to show children the way of living, as role models*" and another learner added, "*you can talk to them and teach them that this and that causes this, and then if you can do like this you can be better, and you tell them that if you do this you have life, if you follow this instruction there is something that is good that is going to come out of that*" (SDAG6Lfg,Int2,p3).

On learner commitment in relation to waste management for Grade 6 learners, learners were asked how they run their waste management activities, why they participate and who decides what needs to be done. Learners reported that they started getting involved when someone came to their school to talk to them about becoming an Eco-School and they were taught that they must save water and not waste it. And then, they said, they went to the science festival where they saw things that were made from waste plastic and they were taught how to make them. And also, a lady called Miss Helen went to their school taught them about waste and that they "*must pick the papers*" (SDAG6Lfg,Int1,p6). This lady also gave them some apples because they looked after the trees that they had planted some time back. Grade 6 learners said they learn about waste in class, at Eco-Schools and also at home (SDAG6Lfg,Int1,p6). They said their teachers ask them to bring used items from home which they can work with at school (SDAG6Lfg,Int2,p2).

Learners reported that they become involved in waste management practices out of curiosity, "*By curiosity, we ask questions and then when we get the answers, we want to do it by ourselves*" (SDAG6Lfg,Int2,p4). They also explained that they get involved because they live in an environment where they have waste problems, so then they can teach others to stop the problems of waste. Learners also reported that they get involved in recycling waste because they are preparing themselves for the future so that they can be self-sufficient in future, "*We are preparing for the future because in the future it's getting harder and harder. So we are learning to be self-sufficient*" (SDAG6Lfg,Int2,p8). They continued to say that when they grow up, they would like to become business people so the business skills they acquire will help them in the future. Another learner said that learners recycle for fun. Learners also noted that they use waste creatively so that they can sell and make money for themselves, "*They teach us many things and they make us, the things that we do, they bring us money, like pocket money. Maybe we need something and then you sell it and then you've got money in your pocket*" (SDAG6Lfg,Int2,p8).

Lastly, on learners' reported vision for better waste management, Grade 6 learners reported that they would like to see a green world where people are happy and live in peace because where they live things are not improving, as quoted, " *I wanna see a green world, a happy world living in peace because here outside ah! Ah! I can't see anything improved*" (SDAG6Lfg,Int2,p10). The learner noted that inspite if telling people about waste management, things are not improving.

Another learner said that she would like to see people carry out what they are taught, "*We want to see people do what we teach them to do because some of the people they do things verbally not practically*" (SDAG6Lfg,Int2,p10).

Reading through the learner narratives, I can make the following summary about the aspects of action competence;

Table 6 Evidence of aspects of action competence

Reported actions on waste management	Learners bring used buckets that are not needed at home. Learners are involved in managing their waste but they also collect waste from other places to recycle and make products at school. Learners are telling others about what they are learning. Learners are proud to talk about the products they make out of waste and how they make money from them and how these skills will help them in future.
Reported knowledge of waste management	Learners are mostly trying out creative use of waste rather than finding out more about waste itself (learning is activity-based rather than knowledge generation). Learners did not show evidence of knowledge about waste, their answers showed a lack of knowledge with a lot of emphasis on what was of significance to them i.e. that managing waste is helping them deal with the problem of poverty.
Reported commitment on better waste management	Learners recycle materials to sell and make money and also for their own personal use. Learners know that the products they make out of waste are unique, this gives them a sense of pride. Learners manage their waste because they do not want to live in dirty environments. Learners recycle and make toys because their parents cannot afford to buy them toys. Learners collect vegetable waste to use as compost for their vegetable gardens so that they don't have to buy vegetables. It is mostly teachers who decide what needs to be done but sometimes learners are invited for their input .
Reported vision for better waste management	Grade 4 learners did not have much to talk about their vision, they just reported that they want to see people pick up papers while Grade 6 learners only said that they would like to see a green world where people are happy and live in peace.

4.4 SUMMARY

To summarise, looking across the two cases, it is clear that they are different in the way waste management is practiced both within the curriculum and in learner experiences. In the next chapter, I will look closely at the evidence generated and develop analytical statements that can be made based on the evidence generated.

CHAPTER 5

REVIEWING AND DISCUSSING THE EVIDENCE

5.1 INTRODUCTION

This chapter examines the data represented in Chapter 4 from the two schools that contributed to the study. These data sets were read as qualitative evidence from which to derive analytical statements for review and discussion in this chapter. The analytic statements have been developed so as to help answer the research questions namely:

- How informed, purposeful and action-orientated is learner participation in Eco-School waste management activities?
- How do Eco-School waste management activities foster active participation and a learner-led agency of action competence?

Action competence is an elusive process that can be difficult to pin down. To approach the idea for the purpose of this study, I read the evidence of learning interactions against the ethos, activities and actions undertaken across the two contexts of the study. This approach allowed me to review the accumulated evidence of action competence and to begin to make statements about these processes of agentive change.

The chapter is structured in such a way as to first review the evidence across the teacher and portfolio data with respect to ethos and curriculum (see School and curriculum management, below). It then reviews the data from learners in relation to their experiences, roles and sense of agency (see Significance to learners, below). The evidence is examined as a research interest across the two cases reviewed but this is done in such a way as to avoid generalisation and to point to processes influencing and shaping action competence in each case context. The analysis is thus cumulative in the sense that evidence is successively used to generate statements that speak to the research question and are discussed in relation to the literature.

The evidence allowed two clusters of interpretative statements to be made:

5.2 ANALYTIC STATEMENTS

5.2.1 School and curriculum management in the Eco-School cases examined

- A school management ethos of engaging learners in meaningful activities appears to be significant in the cases examined.
- Although teacher initiation was dominant in both cases, it is clear that this was accompanied by teachers leaving spaces open for prompting of learner initiative.
- In the activity-based approaches to waste management examined, knowledge acquisition was somewhat superficial. (Often, when learners were asked to say what they were learning about waste, they reported the waste management activities that they were involved in).

5.2.2 What was significant to learners in the waste management learning interactions

- Whereas a community recycling depot in the affluent school was accompanied by artistic / creative use of waste as well as better use of a resource like waste paper, in the less affluent school the learners approached waste as a resource to be collected so as to make money.
- Active participation in practical waste activities (action orientated) and the positive experience of doing things that contribute to a cleaner and healthier environment and that add value to others appears to shape a clear agentive purpose and a pride in which learners are excited to share.

5.2.3 School and curriculum management in the Eco-Schools examined

Analytical statement one: A school management ethos intent on engaging learners in meaningful waste management appears significant.

SUMMARY OF EVIDENCE

Although the action competence literature centred on learner-initiating, clearly the ethos of the school and the intent of the teachers were important. This suggests that

learners do not often initiate and lead waste management activities. There is, however, clear evidence that they take up ideas most notable in practical activities to help others and creative activities to earn money. Teachers reported positive support from their school management and how they also had a personal interest in running a waste management programme in their schools. In an interview with the Eco-School teacher from Kingswood Junior, she mentioned that the reason she decided to initiate a waste management programme in her school was that she thought that it would have an impact on the children. (see Section 4.2.1). Here, the teacher took a leadership role to initiate a waste management programme in the school which had not existed prior to the inception of the programme. Also, in both Grahamstown SDA and Kingswood Junior Schools, there was evidence of support coming from the school management especially the principals. At Kingswood the teacher reported that the Headmaster constantly reminded learners about waste issues, while at Grahamstown SDA, in an informal interview with the teacher, she reported that the school principal is the one who made efforts to contact different organisations to donate various types of waste for recycling in their school, (see Section 4.4.1).

As reported in Chapter 2, Haingura (2009), probing the role of educators, found that enthusiastic and committed teachers are needed for Eco-School programmes to achieve the desired outcomes. Also, in their year 5 end of year report, the Wildlife and Environment Society of South Africa observed that the support of teachers and school principals was vital in running Eco-School programmes in South Africa. In as much as learners are expected to take an active role in the running of environmental programmes at school, a school management culture that supports environmental activities is equally important as this provides an enabling environment for learners to take up environmental projects and exercise agency. So a school ethos that is supportive of a waste management programme was important for the teacher as well as for the learners in both cases.

Analytical statement two: Although teacher initiation was dominant in both cases, it is clear that this was accompanied by teachers leaving spaces open for prompting of learner initiative.

Summary of evidence

In both schools, it was mainly the teachers' initiative that enabled the start of a waste management system. For example, at Kingswood Junior, the teacher explained that she decided to register her school because of her interest in the environment while at Grahamstown SDA School, all teachers are involved in the Eco-School activities and

three of them coordinate activities, (see Section 4.4.1). However, although the Eco-School activities appeared to be teacher-led, there was evidence that this was accompanied by teachers leaving spaces open for learner initiatives to be carried out. There was evidence that teachers achieved the building of learners' abilities to act with reference to environmental concerns. At Kingswood Junior, this was evident in the learners' work where learners were engaged in various activities like sorting and counting of waste, as well as in the creative use of waste while at Grahamstown SDA School, learners were collecting and creatively using waste for entrepreneurial purposes (see Section 4.5.2). There was also evidence of learners' active involvement in the activities they were engaged in and a conscious making up of their minds to get involved in them as opposed to behaviour modification, which could be as a result of pressures from somewhere as Jensen and Schnack, (2006) noted in the differences between action competence and behaviour change. In both cases, there was evidence that learners were not being forced to become involved in these activities as they cited other reasons for their involvement, for example creatively using waste to make gifts for the poor at Kingswood Junior, to have a cleaner environment in both schools, and to make money from selling their products at Grahamstown SDA School.

Analytical statement three: In the activity-based approaches to waste management examined, knowledge acquisition was somewhat superficial.

Summary of evidence

In both cases, often, when learners were asked to say what they were learning about waste, they mentioned the waste management activities that they were involved in. For example, when Grade 4 learners at Kingswood Junior School were asked what they knew or what they were learning about waste, they spoke about their action activities around waste like learning how to separate waste and learning how to recycle waste materials. So, there was evidence of activity-based learning, which is a component of outcomes-based education where learners are expected to engage in a series of learning activities. However, not much was said about what exactly they were learning about waste; for example, learners did not show evidence of their knowledge about where waste comes from, the different types of waste, how much of it is produced in their

school/community/country, who it affects or any other knowledge that they had gained about waste. This then prompted me to ask them further questions probing for learners' knowledge of waste as a problem, how it comes about and how it could affect them and the environment and some possible solutions to the problem that would lead to some informed action. Here, there were clear differences in learner knowledge between Grade 4 learners and Grade 6 learners in both cases. For example, Grade 4 learners at Kingswood School explained that they knew that they 'must not throw their rubbish outside' and they went on explaining what should be done with the rubbish. They also explained all the various activities that they were doing with their rubbish at school (see Section 4.3.1).

Grade 6 learners of the same school also described all the various activities that they were doing using the rubbish but they were also able to relate this knowledge to their everyday life experiences. For example, Grade 6 learners recalled how, in the year before this study, their school was hit by a tornado and that all the waste that they had collected was blown away and how this messed up their school and the streets (see Section 4.3.2). They were also able to link waste with other curriculum subjects like science where they were taught about pollution and waste and how for example, saving paper helps save trees and how by managing their waste, they are helping prevent global warming. At Grahamstown SDA School, Grade 4 learners reported that managing their waste and re-using it means that they will always have something to use when they need it instead of throwing re-usable material away and that not managing their waste properly would make their school and surroundings dirty. Grade 6 learners at Grahamstown SDA also spoke about the waste management activities they were involved in and how they are helping to make their school and surroundings clean. Grade 6 learners went further to explain that it was important for them to teach others about waste because it needs everyone to be involved to solve this problem. They explained how waste problems might affect people and the environment, by making people sick and spreading germs in the environment.

However, as was explained in Chapter 2 (Jensen & Schnack, 1997, Breiting *et al.*, 1999), note that to develop student's action competence means 'developing their ability

and will to take part in democratic processes concerning man's exploitation of and dependence on natural resources in a critical way'. And that the ability to take action is dependent of some factors like acquisition of coherent knowledge of the 'problem of concern, the nature and scope of the problem, how it arose, who and what it affects and the range of possible solutions for it'. In both cases, although some aspects of this kind of knowledge acquisition were evident, it was only superficial and not coherent according to the responses that learners gave. Their knowledge lacked detail and clear facts about the issue of waste.

5.2.4 WHAT WAS SIGNIFICANT TO LEARNERS IN THE WASTE MANAGEMENT LEARNING INTERACTIONS

Analytical statement four: Whereas a community recycling depot in the affluent school was accompanied by artistic / creative use of waste as well as better use of a resource like waste paper, in the less affluent school the learners approached waste as a resource to be collected so as to make money.

SUMMARY OF EVIDENCE

What was evident in both cases was that learners found it a significant thing to be involved in waste management activities in their schools. However, there was a clear difference in the way waste management was being carried out in the two schools. At Kingswood Junior School, learners enthusiastically reported about the existence of a well-functioning recycling depot in their school and how everyone is involved in bringing recyclable waste from home which is then used in art or other learning areas to make creative materials like boats, bins and paper pads which they then donate to other less privileged schools. Whereas at Grahamstown SDA School, learners spoke enthusiastically about how they source recyclable waste from different places in Grahamstown like Rhodes University and *Grocott's Mail* and they then use it to make creative products which they then sell and make money for themselves. In both cases, learners spoke with a passion about their involvement and how all this is helping make a positive difference in their own or other people's lives.

Jensen & Schnack (1997), and Breiting *et al.*, (1999) noted that some of the factors that are necessary in building learners' action competence are real-life experiences and that

by participating individually or collectively to facilitate change as well as self-esteem, the ability to co-operate, and build self-consciousness and self-confidence. These aspects were evident among the learners as learners were clearly involved in these waste management actions collectively at school and also some of them individually at home. For example, at Kingswood Junior, learners reported doing some actions like separating and sorting their waste in class and the creative use of waste, while at Grahamstown SDA, learners reported activities like collecting waste from different places and the creative use of waste. In both cases, there was also evidence of self-esteem, for example Grade 6 learners from Grahamstown SDA noted that the products that they make out of waste material were 'unique' and that the skills they acquired would help them cope with the economic challenges in future as they would be able to make money out of 'nothing' as the waste that they used is a free resource.
Learners also showed some evidence of self-consciousness as Grade 6 learners from Kingswood Junior spoke about how they are 'becoming aware that the world is heating up' and that there is a need for them to act now or risk not being able to live on this planet any more. Kingswood Junior learners also showed evidence of taking the initiative to become informed about environmental issues in general as some of them reported that they decided to do some research on different topics and one of them reported that he decided to get involved in managing waste after watching an environmental film.

Analytical statement five: Active participation in practical waste activities (action orientated) and the positive experience of doing things that contribute to a cleaner and healthier environment and that add value to others appears to shape a clear agentive purpose and a pride that learners are excited to share.

SUMMARY OF EVIDENCE

From listening to the learners' agentive speeches, one can note that learners were talking optimistically about their activities. Active participation in practical waste activities (action orientated) appears to shape a clear agentive purpose and a pride that learners are excited to share, notable here being, activities that benefit others; such as helping to clean the environment and the prospect of the creative use of waste with economic return. It was evident in both cases that learners felt that their participation in waste management practices was a positive contribution to a cleaner and healthier environment and that by making something useful out of waste for the less privileged they are making a positive contribution in their society. This was also confirmed in

their visions for better waste management where for example, learners from Kingswood Junior felt that they would want to meet visitors who come from other countries and discover how they are keeping their environment clean and then do the same in their own countries. Grade 4 learners at Kingswood Junior reported that they get involved in managing their waste because they think that they are helping the environment through saving trees and also that they can help those who have nothing by making something for them out of waste. Grade 6 learners at Kingswood Junior reported that they decided to get involved after seeing how dirty their school used to be before the waste management programme and that they decided to do something about it so that they could live in a cleaner environment. At Grahamstown SDA School, Grade 4 learners reported that they get involved in bringing used items like buckets that they do not need at home to school because they can use them at school to grow their plants and it would be such a waste if they were to throw these away as it would cost them money to buy such materials, also polystyrene trays and other cardboard that they use to make picture frames. Grade 6 learners at Grahamstown SDA School also reported that they see a lot of waste problems in their homes and they decided to get involved in waste management programmes at school so that they can help teach others in their communities about waste management so that they can live in cleaner environments that are free of germs and diseases. This was in line with what the Municipal Officer observed (see Section 2.7) about residents of Grahamstown not taking part in caring for their environment.

They also noted that the fact that they can sell the products which they make out of waste, like picture frames, hats and pencil holders means that they are equipping themselves in business skills as a number of them said they would like to become business people in future and become 'self-sufficient'. They also reported that they get involved because they would like to help others become self-sufficient like them as they said, they are aware that life will get harder and that people will need to find ways of becoming self-sufficient.

Jensen and Schnack (2006, p46) differentiate between behavioural change and action. They noted that, "*Related to action, there will always be a conscious making up of*

one's mind, while this is not necessarily the case with a behavioural change which could be caused by pressure from other people, e.g. a teacher or peers). So in behavioural change, learners may do things because they are forced to or because someone is influencing them whereas in action, learners decide by themselves whether they want to be involved or not. In both cases, it was clear that learners were qualified participants and not just spectators as they had a motivation for their involvement and were excited to share their experiences. For example, learners gave various reasons for their involvement in waste management activities like wanting to see a change in the way waste was being handled in their school environment.

5.3 SUMMARY

Finally, this chapter has reviewed and discussed qualitative evidence of data from the two case studies generated in the research process. As action competence comprises knowledge, hands-on (action) experience (collective or individual), visions and commitments (Breiting, et al., 2009, p49). Looking across the two cases, there is clear evidence of action competence among the children but it is difficult to attribute that to particular kinds of pedagogical practice. Clearly one needs to bear in mind that action competence cannot be conclusive as it is not entirely conclusive what it should consist of.

CHAPTER 6

SUMMARY AND RECOMMENDATIONS

6.1 INTRODUCTION

This chapter presents a summary of the main findings of the study in relation to the research question, some critical reflections and limitations of the study and some recommendations.

6.2 SUMMARY OF THE RESEARCH

This study was a collective case study of two Grahamstown Eco-Schools where I was examining the development of action competence amongst learners participating in waste management practices in an Eco-School context. My main research questions were;

- How informed, purposeful and action-orientated is learner participation in Eco-School waste management activities?
- What Eco-School waste management activities are fostering active participation towards a learner-led agency?

I worked with Grade 4 and Grade 6 learners in the two schools in an Eco-School context to examine their involvement and their reported experiences in waste management activities. I also worked with their teachers and probed for contextual data as well as evidence of learning activities and learner involvement. Data were generated mainly through focus group interviews, document analysis and semi-structured interviews. I also took field notes and photographs during the interviews and I documented my field notes in a research journal. Data were analysed by developing analytic memos which were further generated into analytic statements. Learner focus group interviews were also analysed for agentive speech.

6.3 KEY FINDINGS

Evidence generated in the study revealed that school management ethos and teacher intentionality were significant in engaging learners in meaningful waste management activities. In both cases, the school culture provided an enabling environment for

learners to carry out waste management activities. For example, presence of recycling bins in classrooms, presence of an environment committee and a team of teachers coordinating Eco-School activities.

The study also revealed that although most of the learning activities were teacher-initiated, there were spaces left for learners to take up responsibilities. However, like what Haingura (2009) found, most of the learning activities appeared to be teacher-initiated rather than learner-initiated as most of the literature on action competence supports learner-initiated activities.

In this study, it was clear that much of the learner involvement in Eco-School practices was at the level of participating in activities, just as Rosenberg (2008) found. This allowed learners to acquire knowledge on how to do things (waste management activities), rather than finding out more about the nature and scope of the environmental problems in question (waste). This was evidenced in the fact that whenever learners were asked to report what they were learning about waste, they reported about ways that they used waste.

The school contexts appeared to be significant as there were clear differences in the way waste management programmes were being run. In the more affluent school, facilities were available to allow learners to participate easily in collecting, sorting and recycling of waste. For example, each classroom had different types of bins for different waste. However, in the less resourced school, such facilities were not there. Therefore, learner activities involved sourcing of waste from other places like Rhodes University and this was then used in their recycling activities. Another difference was the way learners in the two schools approached waste. In the more affluent schools, learners made creative use of waste to make things that would benefit others whereas in the lesser resourced school, learners made things that they could sell and make money for themselves. Nevertheless, in both cases, learners were proud to share their experiences with others, and it was apparent that Eco-Schools is helping build learners action competence as it is allowing learners to gain action experiences in solving environmental problems in their local contexts.

6.4 CONCLUSIONS AND RECOMMENDATIONS

Looking across the research findings presented above, this allows me to make the following conclusions and recommendations

- That in an Eco-School context, the role and support of the school management as well as teachers' intent are very significant in allowing learners to engage in meaningful waste management practices and cannot be overemphasised. This was also revealed in the 2008 Eco-Schools report for the Wildlife and Environment Society of South Africa as well as in Haingura's (2008) work on the role of teachers in Eco-Schools. Therefore, these need to be recognised in Eco-School programmes.
- That there is a need for Eco-School activities to allow for more democracy in enabling learner-initiated activities. This may be achieved by empowering learners to take up decision-making roles without necessarily taking removing the role of teachers in supporting learners to do this.
- Much as it is important for children to be trying out, (learning how to recycle for example) they also need to be finding out (about) in the classroom to allow for coherent knowledge that is needed for informed action. Learners need to be knowledgeable about the environmental issues that they are working on. Such knowledge may be gained through making some changes in the school curriculum such that it allows for more information-seeking activities that may allow learners gain more coherent knowledge about the environmental problems that they work on. Such knowledge is necessary as this may also equip learners with critical thinking skills so that they may re-think their environmental actions to evaluate whether indeed by engaging in such activities this allows them to address the environmental problems that they desire to solve. For example, learners that get involved in collecting recyclable materials as was the case at Kingswood Junior may wish to work out the costs and the environmental risks involved when a local recycling company collects such waste from their school and transports it to distant cities where it is then sorted and a lot of energy is used in recycling the waste. Rethinking such activities may allow learners to come up with alternative ways of dealing with

waste to avoid other hidden environmental risks. For example, learners may choose to reduce waste in their homes so that there is not a need for them to send recyclable waste to other cities, and they may choose to recycle the small amount of waste themselves.

- It is also important to provide resource books that contain facts about various environmental issues that learners seek to address in an Eco-School context. These could come as part of the Eco-Schools pack and teachers and learners may engage with such materials to enhance their knowledge about environmental issues/risks and will empower learners to make informed decisions in undertaking environmental action. This will ensure that both well resourced and less resourced schools have equal access to information about environmental issues.

6.5 CRITICAL REFLECTIONS ON THE STUDY

My work experience in working on the Eco-Schools Programme within the Environmental Education and Sustainability Unit at Rhodes University was significant in this research process as it allowed me to have some background understanding of how Eco-Schools are run and the contexts in which they work. This allowed me to have a richer experience and insights to develop research skills.

Also, having worked with two Eco-Schools that were contextually different allowed me to learn about the development of action competence by looking at each case as a distinct case, without doing a comparative case study.

Working with learners directly in this research process allowed me to have first-hand data on learner experiences and their involvement as previous studies that were done with Eco-Schools did not work with learners directly. However, in working with children one needs to be careful in building a rapport with children so as to gain their confidence and trust so they may freely share their experiences. In this research, I tried to do this by having respect for the learners and their information and seeking their permission first before doing anything. At the same time, one also has to be careful to guide learners in discussions as learners tend to have a lot to say if they are talking about something that they are passionate about.

However, there were some weaknesses associated with the study. First, the sample only included a small percentage of learners in each school as only 10 learners or less were involved in each of the two Grades in the schools selected. Also, the presence of the Grade 6 class teacher during focus group discussions at Kingswood Junior may have influenced learner participation in one way or another. But given the circumstances, it was difficult to ask the teacher to leave as she was expected to be in her class at this time.

Also, since the study was about learner agency it focused much on the learners than teachers. However, since learners depended a lot on teachers, it would have been worthwhile to focus more on the teachers as well, and to probe more on the lesson plans that the teachers designed.

During the research process, the problem of language also came up especially with one of the schools where learners were more confident in using their mother tongue while I as a researcher did not have a command of this language. Therefore I had to look for the help of an interpreter.

6.6 AREAS FOR FUTURE RESEARCH

The concept of action competence was very useful in this study in helping me understand and examine learner experiences through participation in waste management practices. This helped me make recommendations on Eco-School waste management activities. However, one needs to bear in mind that action competence is a very difficult concept to comprehend and that further research in this area will have to take this in consideration. Also, integrating both learner experiences and teacher practices would be ideal in this type of study. Monitoring and evaluation of Eco-School programmes would also help in knowing how learner agency may be enhanced through an Eco-Schools context.

6.7 CONCLUSION

This case study has examined the development of action competence in two Grahamstown Schools. It has drawn strongly on the action competence framework using ideas from Carlsson and Jensen (2006), (Jensen & Schnack, 2006) and Breiting, et al., (2009) that action competence has characteristic elements of insight and

knowledge, commitment, vision, experience and social skills. It highlighted that in the cases examined, school ethos and context were significant and that learner involvement was mainly at the level of participating in activities. It also highlighted that knowledge acquisition through learner activities was superficial.

It is hoped that this research may inform educators, curriculum advisors as well as Eco-School programme coordinators in monitoring and evaluating environmental education work through Eco-Schools.

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APPENDICES

APPENDIX 1 – INTERVIEW SCHEDULE FOR MUNICIPAL OFFICER. 17th February 2009

1. Is waste in Grahamstown an issue? Please explain.
2. Why was there a need to provide black bag only to certain residents of Grahamstown and not to others?
3. Are there any educational programmes put in place to address the issues/risks associated with waste?
4. Why was there a need to create the post of an environmental manager within the municipality?
5. Are there any guiding policies that you work with?
6. What gaps do you see in the area of waste education in Grahamstown?
7. Tell me about the new recycling system

APPENDIX 2 - LETTERS OF CONSENT

RHODES UNIVERSITY

RHODES UNIVERSITY ENVIRONMENTAL EDUCATION AND SUSTAINABILITY UNIT
Rhodes University Department of Education, PO Box 94, Grahamstown, 6140
Tel: +27 (0) 46 603 8389 • Fax: +27 (0) 86 515 2787 •

29th July 2009

To whom it may concern

Request for permission to conduct research

Ms Nellie Chiphwanya (student number 04C5212) is a Masters student registered at Rhodes University in the Environmental Education and Sustainability Unit in the Education Department. Ms Chiphwanya's research is focussing on learner participation in waste management practices in an Eco-schools context. Should you grant Ms Chiphwanya permission to conduct research in your organisation, she will provide further information on who she wants to speak to, what kind of data she will be interested in gathering, and will negotiate any ethical considerations related to her research.

Should you have any queries relating to this, please contact me at k.ellery@ru.ac.za on +27 (0) 46 603 8390.

Sincerely

K. Ellery

Mrs Karen Ellery
Environmental Education and Sustainability Unit

Supporting the • Murray & Roberts Chair of Environmental Education & Sustainability and the • Gold Fields Environmental Education and Sustainability Service Centre
• In partnership with the Environmental Education Association of Southern Africa

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31 July 2009

Dear Miss Chiphwanya

Thank you for your interest to do your research with us . We are very pleased to be part of your research. Please feel free to interact with our learners and teachers while doing your study. We will be happy to give you any information that you need.

We wish you all the best on your research.

Yours faithfully

Ms SC Hobongwana
(Principal)

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7 October 2009

TO WHOM IT MAY CONCERN

We at Kingswood College give permission for Nellie Chipanya to do a presentation to the Grade 4 class for her Masters Degree in Environmental Education.

Yours Sincerely

pp

DEREK BRAANS
HEADMASTER: KINGSWOOD JUNIOR SCHOOL

ISASA

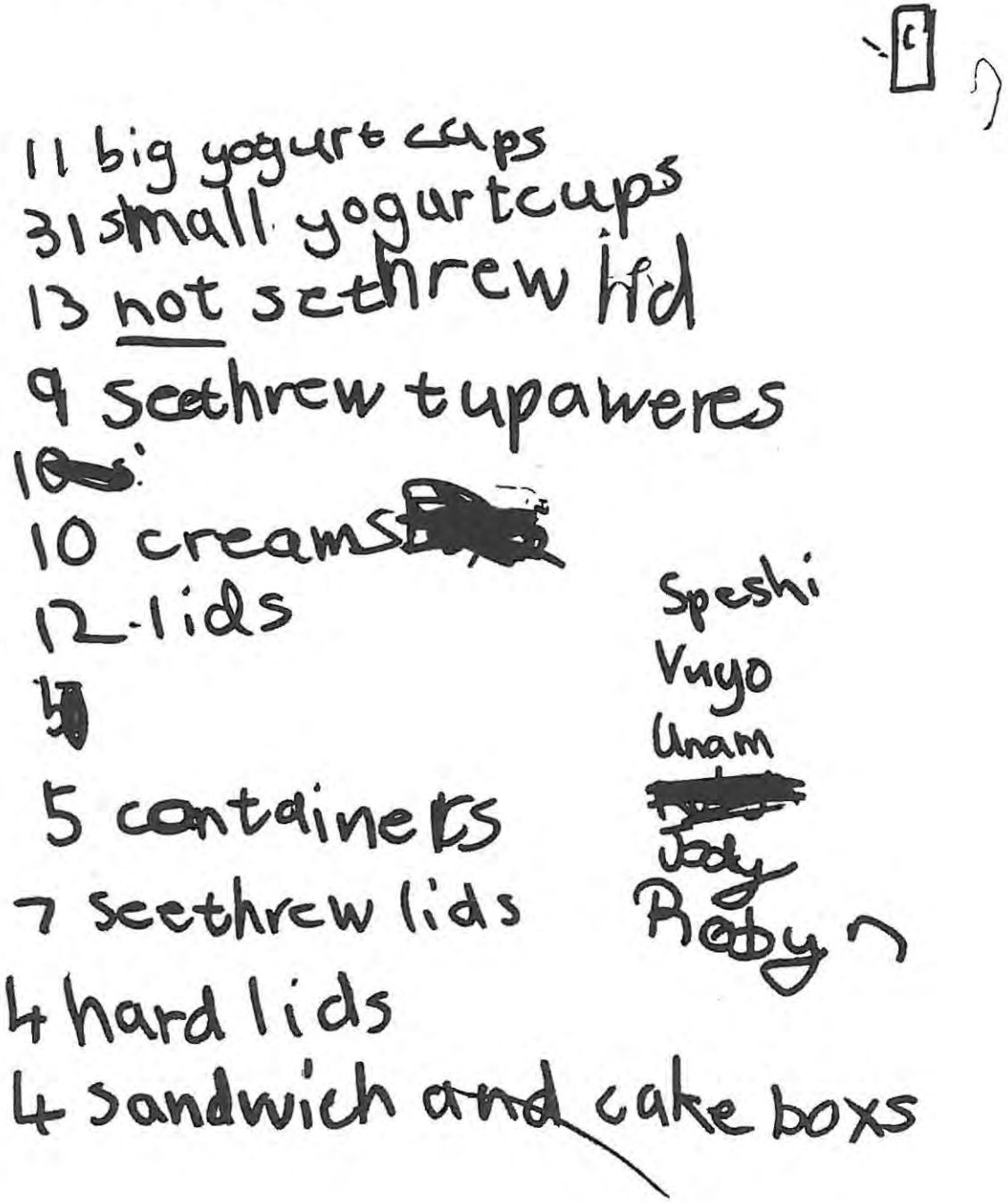
APPENDIX 3 - INTERVIEW SCHEDULE FOR LEARNER FOCUS GROUPS

1. Tell me what you learn about recycling and waste management at school
2. How do you participate in your school's Eco-School waste management and recycling programme as a group?
3. How do you participate in your school's Eco-School waste management and recycling programme as individuals?
4. How did you start getting involved in this programme?
5. Why did you start getting involved in this programme?
6. Do you think it is important to manage and recycle your waste? Why? /Why not?
7. What do you want to see as a result of your participation?
8. Who decides what needs to be done and how do they do that?
9. Do you tell others about these practices and if so, is it easy for you to do that?

APPENDIX 4 - INTERVIEW SCHEDULE FOR ECO-SCHOOL TEACHERS

1. Please tell me about your waste management activities at the school (What inspired you and what useful sources of information did you use)
2. Was waste management included in the lessons you taught? (Which LAs)
3. What was undertaken with learners in Eco-School projects? (Any action-orientated projects?)
4. What responsibilities did the learners have? (What sort of commitments did they have to make?)
5. How did you achieve active learner participation? (Were there any initiatives taken by learners?)
6. Were the learners engaged in any in practical waste management actions? (Please explain how this was achieved).
7. What, if any, positive results did you note that came from learner participation in waste management actions?
8. Did you work with the Eco-School Pack? How did this help you? (provide information, activities to get learners involved to develop civic responsibility and capability?)
9. If you were to do a waste management project again how would you do it differently based on what you have learned?

APPENDIX 5 – EXAMPLES OF LEARNERS' WORK AND LEARNERS' ACTIVITIES WITH WASTE



Learners counting and sorting waste (Kingswood Grade 4 learners)

Learner showing some of their products that were made from waste (Grade 6 learners at Kingswood Junior)

Some products made by Grade 4 learners at Kingswood Junior from waste paper

Picture frame made from waste by Grade 6 learners at Grahamstown SDA School

Pencil holder made by Grade 6 learners at Grahamstown SDA School