Evaluation of the Enviromental Education Youth Club Programme implemented within North-West Province, South Africa

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DECLARATION BY CANDIDATE

I, Nemutandani Mashudu Lucky hereby declare that the dissertation submitted is my own original work carried under the Supervision of Prof Ravinder Rena and has not previously been submitted to any other institution of higher education. I further declare that all the sources cited are indicated and acknowledged by means of a comprehensive list of references.

_____ _____

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ABSTRACT

The North West Province Department of Rural, Environment and Agricultural Development has been implementing the environmental education programme for the past 10 years. As part of monitoring and evaluation, a need was identified to evaluate the programme. Hence, the current primary research problem is to investigate the impact of the EE youth club programme as a performance measure of achieving selected environmental education targets for meeting departmental strategic objectives. In order to carry out this research, a qualitative and quantitative research method was used. The survey population was drawn from four district municipalities of the North West Province. The questionnaire was used to determine the impact of environmental education on attitude towards the environment and to find out the concerns task ranking order of participants as a measure of achieving strategic objectives. The questionnaires were administered to 431 environmental education beneficiaries and 3 departmental officials. Furthermore, the analysis of five years of departmental annual reports was done to complement the findings. Independent T-test and one-way Analysis of Variance was used to test significant difference.

The findings revealed a comparatively high mean score (Mean 49.93, St. Deviation = 6.98) attitude towards the environment by environmental education beneficiaries. The overall mean attitude (Mean = 2.85, and St. Deviation = 0.36) towards the environment was slightly lower compared to post-exposure results from other studies. No significant difference in mean attitude toward the environment as a result of gender and age groups was found. However, a statistical significant difference was found as a result of residential district municipality, with youth from Dr Kenneth Kaunda District Municipality (Mean = 1.99, St. Deviation = 0.993) and Ngaka Modiri Molema District Municipality (Mean = 2.52, St. Deviation = 1.253) having a significantly lower attitude towards the environment compared to those from Bojanala Platinum District Municipality (Mean =2.59, St. Deviation = 1.180) and Dr Ruth Segomotsi Mompati District Municipality (Mean = 2.69, St. Deviation = 1.163) Similar to other studies, environmental concern was ranked highly with school performance. No significant difference was found in concerns task ranking order as result of gender and only a slightly significant difference was found in ranking order as a result of age groups with younger youth showing a higher concern. As expected there was a slight significant difference in ranking order as a result of residential district municipalities. Over the past years there has been a trends of over-achieving on selected environmental education targets.

In conclusion the current study has successfully prove that EE youth club programme is achieving departmental strategic objectives. However, development of a comprehensive environmental education programme strategy, strategically planned pre- and post-exposure and follow-up activities targeting participants as a way to reinforce and establish longer-term changes in behaviour, and sound monitoring and evaluation tools is recommended.

Key words: Environmental education programme, childhood concerns ranking order, North West Province, Environmental youth programme, environmental empowerment, sustainability development, Agriculture and Rural Development, climate change, environmental empowerment.

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LIST OF ABBREVIATIONS

Table 1. Abbreviations used in this document

Abbreviation	Meaning
ANOVA	Analysis of variance
APP	Annual Plan of Operation
CATES	Children`s Attitude Towards the Environment Scale
CCROT	Childhood Concerns Rank Order Task
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
EE	Environmental Education
MAB	Man and Biosphere Programme
NEMA	National Environment Management Act 107 of 1998
NWU-IRERC	North-West University Institutional Research Ethics Regulatory Committee
REB	Responsible environmental behaviour
READ	North West Provincial Department of Rural, Environment and Agricultural Development.
RSA	Republic of South Africa
SC3	Student Climate and Conservation Congress
SPSS	Statistical Package for the Social Science
TBL	Triple bottom line
UK	United Kingdom
UNEP	United Nations Environment programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WEF	World Economic Forum

CHAPTER 1 INTRODUCTION TO RESEARCH

1.1. Introduction

The present chapter outlines the general introduction and background of the research study. It further introduces research problems, objectives and provides the significance of the current study.

Over the past year, there has been an increase in environmental education (EE) research and this is supported by the large number of research publications it contributed to the field of education as stated by Hart and Nolan (1999:1). This is as a result of previous studies that have shown that EE can change the environmental attitude and behaviour of participants (McDuff, 2000:391; McDuff, 2002:29; Rickinson, 2001:221; Stern *et al.*, 2008:35). Similar to other organisations within South Africa, the North West Provincial Department of Rural Environment and Agricultural Development (READ) responsible for the environment has implemented an EE youth club support programme over the past years with substantial resources. As part of accountability and performance measure, it has become essential to demonstrate results from implementing such a programme which is similar to what was reported by Thomson *et al.* (2003:3).

The need for evaluation research on the success of EE youth club programme was supported by senior management who are responsible for implementation of the programme within the province, the reason being that the outcome of the current study can be used to benchmark future evaluation, substantiate continued funding and for the improvement of the programme.

1.2. Background of the Study

The value of EE has been justified by several publications dating as early as 1990`s as well as by several institutions that are actively involved in EE. In South African there are over 300 institutions that are involved either directly or indirectly in EE (Cornwell, 1996:82). Within the South African context, as a result of accountability and limited financial resources, the government has put more emphasis on monitoring and evaluation. This has been more apparent by the establishment of a monitoring and evaluation portfolio within the president`s office (Ramafolo, 2012:2).

The EE youth club support is implemented in four districts namely Bojanala Platinum District Municipality, Dr Kenneth Kaunda District Municipality, Dr Ruth Segomotsi

Mompati District Municipality and Ngaka Modiri Molema District Municipality. The implementation of the programme entails registering youth both at primary and secondary schools. The youth are then encouraged to form groups through which departmental officials conduct EE awareness programme. The EE awareness is aimed at capacitating youth to enable them to have a meaningful contribution to environmental issues at local, regional, national and international levels.

1.3. Problem Statement and Core Research Questions

South Africa is a developing country with massive infrastructure development projects. Sporadic increases in townships, informal settlement development and associated infrastructure have been reported. As a result of economic development initiatives, there has been environmental degradation and loss of ecosystems services which is an unintended consequence. According to the study conducted within the province (Schaller *et al.*, 2015:29), there has been an increased change in land cover of 0.05% per year. Such changes can directly be linked to human activities e.g. agriculture, mining, and urbanisation. As indicated by the recent study (WEF, 2016:13) the major challenges facing economic development globally are related to environmental. Globally over the recent years, there have been talks around sustainable development which South Africa is committed to.

In pursuit of compliance to sustainable millennium development goals, greater emphasis is placed in EE as a possible strategic solution worldwide. The recognition of EE is as a result of impacts it has on attitude and behaviour change. The North West Provincial Department of READ has initiated EE youth clubs. The aim of EE youth clubs is to fulfil the domestic environmental legislative (National Environmental Management Act (NEMA) mandate as it relates to principle 4(q) which state that "the vital role of woman and youth in environment and development must be recognised and their full participation therein must be promoted". The aim of the EE youth club initiative is to provide environmental awareness so that youth can be able to participate in environmental issues meaningfully and to change their attitude and behaviour towards environmental issues. Hence the department is committed to addressing youth`s aspirations by establishing and rendering services to EE youth clubs.

READ has been implementing the EE youth club programme over the past 10 years or so. As part of monitoring and evaluation, a need was identified to systematically evaluate the programme. As stated by Carleton-Hug and Hug (2010:121) it is a major organisational concern when evaluating the performance of the entire programme, to confidently confirm if

the endeavour is yielding expected results. Hence the primary research question of this study is to investigate the impact of the EE youth club program implemented by READ as an indirect performance measure of achieving selected EE targets for meeting departmental strategic objectives.

The current study secondary research questions are as follows:

i. Does the EE youth clubs programme implemented by READ change attitude of youth towards the environment in comparison with post-exposure results of other studies?
ii. What are the major concerns task ranking order for youth to participate in EE youth club programme?
iii. Are annual targets being met in terms of the number of EE youth clubs established and membership thereof from 2011 – 2016?

1.4. Research Aims and Objectives

The fundamental importance of high-quality EE programme are their ability to create environmental awareness, environmental consciousness and change values, attitudes and behaviour towards sustainable environmental conservation within the community as stated by Bentley (2000:23), Power (2004:28), and Walsh-Daneshmandi and Maclanchlan (2006:16). The consistency and systematic evaluation of programme provide a powerful baseline for improvement and enable programme to achieve more of their objectives and goals (Carleton-Hug & Hug, 2010:159). The objectives of current research study are as follows:

i. determine demographic characteristics of EE youth club respondents;
ii. evaluate the level of attitude of the respondents towards the environment;
iii. analyse concerns ranking order of respondents; and
iv. determine level of EE youth club implementation from annual reports

1.5. Importance and Benefits of the Study

The significance of this study is that implementation of EE youth club initiated by READ will systematically be evaluated. Furthermore, it is hoped the research study outcomes will provide a baseline performance measure against which policy decision makers can

benchmark, provide a sound basis for justifying funding and, where applicable, implement recommendations.

1.6. Scope of the Study

The following sections provide the scope of the research study. The current research will focus on evaluating the impact of EE youth clubs support initiated by READ from 2011 to 2016. It will do so by:

i. Comparing the environmental attitude of youth participating in an EE youth club support programme initiated by READ to other post-exposure studies,
ii. Determining the concerns task ranking order for youth who are participating in an EE youth club programme, and
iii. Assessing if selected EE annual targets are met from 2011 to 2016 financial year.

1.7. Definition of Key Terms

Department - North West Provincial Department of Rural, Environment and Agricultural Development responsible for environmental issues.

Environment - according to Christensen (1993:31) the environment is classified into biophysical, cultural, personal, and global or total human surroundings.

Environmental degradation - occurs as a result of pressure exerted on natural resources being either water, air, land, by human which far exceeds carrying capacity of the environment to repair or replace itself

Environmental Education (EE) - "is a process aimed at developing a world population that is aware and concerned about the total environment and its associated problems, and which has the knowledge, attitudes, motivation, commitments, and skills to work individually and collectively towards solution of current problems and prevention of new ones" (Thomson & Hoffman, 2010:7).

Evaluation - "systematic assessment of the operation and / or the outcomes of a programme or policy, compared to a set of explicit or implicit standards, as a means of contributing to the improvement of the programme or policy".

King Report – code of good corporate governance for South Africa that is meant to be at the forefront internationally according to Naidoo (2009:29), Hendrikse and Hefer-Hendrikse (2012:101)

Sustainable development: refers to the utilization of natural resources which ensures that there is preservation for the future (UNESCO, 2013:112).

Triple Bottom Line Reporting: focuses on three bottom lines, first bottom line being traditional measure of profits and loss account, second bottom line measuring people account by valuing how socially responsible it has been throughout its operations and the third bottom line measuring planet account as an indication of how environment responsible is.

1.8. Layout of the Study

Dissertation format will be followed as outlined:

i. Chapter One: Introduction. It will provide background of the study, research problem statement, set of objectives, importance and scope of the study,
ii. Chapter Two: Literature Review on EE program. This chapter will cover general introduction and literature review of EE programme,
iii. Chapter Three: Research methodology: This chapter will provide research methodology followed for collection and analysis of data,
iv. Chapter Four: Results: Demographic descriptive statistics results of respondents as point 4.1, attitude towards the environment significant analysis between respondents as a results of gender, age groups and residential district municipalities under point 4.2, concern task ranking order significant analysis between respondents as a results of gender, age groups and residential district municipalities covered under 4.3 and, annual plan reports analysis results under 4.4.
v. Chapter Five: Conclusions and Recommendation. This chapter will provide summarised results and general conclusion of current research dissertation. It will also include recommendations to improve the existing EE youth club implemented by the Department of READ.

1.9. Summary

The EE youth club support is implemented in four districts by READ. The need for evaluation research of the EE youth club programme was supported by the senior manager responsible for environmental empowerment, as a concrete baseline for future evaluation, effective and efficient programme management and improvement thereof. The primary research problem is therefore to investigate the impact of environmental education programme among youth as a performance measure of achieving selected EE targets for meeting departmental strategic objectives. The next Chapter will provide literature review on EE, provide precursors that lead to youth participating in EE, provide mechanisms for evaluating EE and conclude by providing a summary of EE implemented by READ tools to measure EE attitude.

CHAPTER 2 LITERATURE REVIEW

2.1. Introduction

The current chapter introduces literature review in the following sequence. Environmental degradation comes under point 2.1 as a worldwide challenge, which requires long-term sustainable interventions supported by sound research. This chapter continues by providing justification and the importance of why youth involvement, roles and responsibilities in the environmental related matter are critical at a local, national and international level under subheading 2.2, titled Environment and youth. This chapter also provides a short literature finding of what triggers youth to be enticed to participate in youth programme under point 2.3, titled Antecedents of youth participation in EE. Furthermore, the chapter continues by providing a definition of environment, education and EE programme; and a literature review on how EE can create environmental awareness, change attitudes and behaviour and different methods of implementing EE programme; this is covered under bullet 2.4, titled Environmental Education. Bullet 2.4 motivates and positions the EE programme as a possible long-term solution to environmental degradation. The chapter includes models and conceptual framework for understanding children`s experience with nature around which the concept of environmental behaviour is centred as contained under bullet 2.5 and 2.6 respectively upon which variables used for EE programme assessments are based. The chapter, in line with the purpose of the current study emphasises the significance of EE programme evaluation under 2.7-title an Evaluation of environmental education by providing different methods that can be used. The chapter provides a summarized synopsis under bullet 2.8 titled EE programme implemented by READ as a basis from which a need for the current study was formulated in order to scientifically answer management questions.

In general, the importance of literature review covered within the chapter was done in order to provide a sound background. Furthermore, it aims to provide a basis on which successful evaluation of EE programme implemented by North West Provincial Department of Rural, Environment and Agricultural Development (READ) can be conducted systematically and scientifically. The current assessment will be used for benchmarking any future assessment.

2.2. Environmental Degradation

According to Verma (2016:182), environmental degradation occurs as a result of pressure exerted on natural resources, being either water, air or land, by humans which far exceeds the carrying capacity of the environment to repair or replace itself. Economic growth has for many years being linked to environmental degradation, with developed countries increasingly being blamed for recently experienced devastating global climate change (Burnett, 2009:1; Piñeiro Chousa *et al.*, 2017:3; Tamazian *et al.*, 2009:247). A typical example is illustrated by the destruction of natural jungle for the plantating of timber (Costa, 2016:699) and pollution of the sea in the exploration of gas and oil (Negri *et al.*, 2016:3; Shukla & Karki, 2016:509) in order to meet economic demands. Furthermore, the recorded extinction of fish (Cooke *et al.*, 2016:2; McClenachan *et al.*, 2016:1640; Ozdemir, 2016:153) and shark (Barreto *et al.*, 2016:2; Fortibuoni *et al.*, 2016:2) species as a result of over trolling in order to meet high demand for food for an increasing human population. The contamination of sea and land as a result of catastrophic destruction of nuclear power stations (Jäckel *et al.*, 2016:33; Ozdemir, 2016:153; Yusof *et al.*, 2017:413) build in order to provide energy for industrial use. South Africa is a developing country with massive infrastructure development projects. There has been recorded a sporadic increase in township, informal settlement development and associated infrastructure. Similarly, because of economic development initiatives, there has been environmental degradation and loss of ecosystem services which is an unintended consequence. In South Africa, the continuous water contamination caused by the inability of municipal sewage treatment infrastructure to sufficiently reduce effluent (Hedden, 2016:10; Stone, 2016:17) as a result of economic growth is of major concern and in some area has caused death due to cholera and E. coli. This has led to the government being criticized heavily and in some area; it has sparked service delivery strikes. According to the study conducted within the province (Schaller *et al.*, 2015:29), there has been an increased change in land cover of 0.51% per year. It has been widely published that such changes can directly be linked to human activities; degradation of habitats; agriculture; mining; and urbanization (Nath, 2016:92; Sousa *et al.*, 2016:13).

According to a recent study by WEF (2016:13) the top five major challenges and risks facing global economic development are related to the environment with recorded average likelihood and impacts being in the range between 4.4 - 5 and 4.6 – 5.7 respectively. As possible global solutions over the past years there has been debate around environmental justice (Driskell,

2002:133), reduction of greenhouse gas emissions (Pothitou *et al.*, 2017:406; Prati *et al.*, 2017:176), sustainable utilization of natural resources (Dietz & Stern, 2015:575). As stated by Leck and Simon (2013:1222) and Nath (2016:93); such discussions are done through international agreements such as the Kyoto Protocol, Climate Change Summit, Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The developing countries jointly petition developed countries to compensate countries that are experiencing severe negative effects of climate change such as drought and floods. The setback on greenhouse gas emissions targets agreements was as a consequence of developed countries wanting to set limits that are set to constrain countries that are still developing and has since resulted in such agreement lagging behind. However, success was reported by the agreement between member states through credible and defendable scientific studies to impose, restrict or suspend trade of endangered or threatened species, for example, the trade in rhinoceros horn (Ayling, 2013:62).

Recently, international, national and local companies are beginning to realize that it is no longer business as usual; this was supported by Dean and McMullen (2007:53). Government and companies are integrating sound and sustainable environment management strategies as an integral part of competitive business management. This has been more apparent both locally and internationally since the introduction of the Combined Code in the United Kingdom (UK), Cadbury Report, Turnbull Report and King Report, Triple bottom line (TBL) (Gamble *et al.*, 2013:256; Hendrikse & Hefer-Hendrikse, 2012:163; Naidoo, 2015:243; Thompson *et al.*, 2016:243). The recently reported acid water contamination in Gauteng Province and other environmental degradation as a result of mining operations has led to negative criticism of mining companies (McCarthy, 2015:viii; Naidoo, 2015:1061). The rehabilitation of such natural resources comes at a heavy price which developing countries cannot meet with other pressing needs such as education and health. It is now a requirement for an institution listing in most of the securities exchanges to show that the environment is considered.

The global recognition of the need to have EE programme strategies that are coherent internationally nationally and regionally was as a result of the first Intergovernmental Conference on EE, which was organized by United Nations Educational, Scientific and Cultural Organization (UNESCO) in cooperation with United Nations Environmental Programme

(UNEP) held in Tbilisi from the 14th to 26th of October 1997. The outcome of the conference agreed by participants in that EE programme, it was seen as a vehicle shape behaviour, change attitudes, encourage problem solving, protect and rehabilitate the environment, improve the health of the world`s ecosystems, prepare and promote active involvement of communities in their surroundings (Nath, 2016:2; Newman & Fernandes, 2016:154; UNESCO, 1997).

2.3. Youth and Environment

According to Driskell (2002:133) youth are said to "constitute larger part of the world population, and children especially, are particularly vulnerable to environmental risks associated with access to clean and drinking water". The youth, our future generation (Johnson & Činčera, 2016:97) have to live with the consequence of current environmental decisions. There have been global incidents where children were severely affected by poor environmental decisions such as drinking of contaminated water leading to high mortality. Similar incidents of high mortality of children were recorded within the province, around the Bloemhof area. It is logical for countries to streamline resources that will develop capacity for youth to be actively involved in local and global environmental issues (Bergman, 2016:497; Erhabor & Don, 2016:5367). It is encouraging that there is scientifically supported evidence of preschool (Musser & Diamond, 1999:29), primary school (Bergman, 2016:480; Shay-Margalit & Rubin, 2017:112), secondary school (Christensen, 1993:152; Cruz & Tantengco, 2017:49; Jackson *et al.*, 2016:70; Komane, 2005:55; Kumar *et al.*, 2016:820; Malkus & Musser, 1997:4; Olufemi *et al.*, 2016:56; Ozdemir, 2016:161), and university students (Kney *et al.*, 2016:3; Prati *et al.*, 2017:176; Richards *et al.*, 2017:117; Schultz & Zelezny, 1999:263) showing awareness, knowledge, attitude and behavioural change towards environment as a result of their exposure to EE. As observed previously, youth can serve as a strong voice in calling political heads to account for environmental decisions. As stated by Driskell (2002:134) EE is one of the ways through which youth`s cognitive skills can be targeted.

It has since become normal to have youth representatives such as International Youth Summit, World Summit and Youth Caucus, Student Climate and Conservation Congress (SC3) through which contributions are solicited (Ernst *et al.*, 2017:149). Organizations such as UNESCO and

Man and Biosphere Programme (MAB) have different awards that seek to encourage youth participation in environmental scientific research (Grúňová *et al.*, 2017:4).

2.4. Antecedents of Youth Participation in EE

The study by Perkins *et al.* (2007:421) shed light on why youth generally get involved in youth programmes, based on general findings by other researchers who suggested an increased recognition of the positive influence youth programs have. His findings that reasons provided by youth were that it helps youth to "stay off streets, learn new skills, avoid boredom and provide opportunities for fun and enjoyable activities". According to Arnold *et al.* (2009:34); Davino *et al.* (2017:5); Johnson and Činčera (2016:108), the major self-identified influences that lead to youth participation in environmental issues are parents, outdoor experience, friends, role models, teachers and peers. The findings of Malkus and Musser (1997:10); Pothitou *et al.* (2017:406); Prati *et al.* (2017:183), seems to suggest that environmental concerns are the major reason leading to youth getting involved in EE. Kiessling *et al.* (2017:83) classified factors that lead to environmental awareness into internal and external factors, being personal experience and contact with the environment.

2.5. Environmental Education

Van der Linde (2010) definition of environment is aligned with the National Environmental Management Act [No. 107of 1998] (NEMA) to be the surroundings within which humans exist. A more practical definition for the environment was provided by Darkoh (1990:22) by categorizing it into land, sea, air or anything on earth. A more academic definition of the environment was provided by Christensen (1993:31) which classified environment into biophysical, cultural, personal, and global or total human surroundings. The right to a clean and healthy environment is enshrined in Chapter 2, that is, the Bill of Rights of the Constitution of the Republic of South Africa (RSA, 1995). The importance of the environment is its ability to sustain life. Kney *et al.* (2016:23) define education to be an important dynamic key development process for improving human knowledge and understanding. According to Roux and Maila (2004:236) education refers to an instructional programme aimed at improving personal skills, qualification and knowledge as a way of development. According to Hungerford and Trudi (1990:257), some of the educational outcomes are clearly predefined such as skills useful in

reading and mathematics. A definition of EE according to Grimmette (2014:5) is "teaching of how humans affect the environment and how the natural environments function". EE includes both formal and informal education and training, which improve human capabilities (Mohamed, 2016:1); Shay-Margalit and Rubin (2017:112); (Williams & Chawla, 2016:978).

The main objective of EE programmes as clarified by Chawla and Cushing (2007:1) is to capacitate the community to be actively involved in formulating workable solutions to environmental challenges, which was also supported by Kil (2016:223). EE can generally be viewed as a process whereby skills are harnessed, values are recognized, concepts are clarified and tools that are necessary to grasp and treasure interlink between a human, his culture and his biophysical surrounding are encouraged. On the contrary, from the views as suggested by Chawla and Cushing (2007:1), Carleton-Hug and Hug (2010:159); Reddy *et al.* (2004:111); Stern *et al.* (2008:31) are of the opinion that the main aim of EE programme is to enhance knowledge, literacy, and general understanding of the environment and promote citizenship. And it is therefore from that basis that general environmental attitudes and behaviour, concern and awareness pertaining to the environmental condition are raised and commitment is gained (Bogner, 1998:18; Grúňová *et al.*, 2017:5). The fundamental importance of high-quality EE programnmes according to Power (2004:18), Walsh-Daneshmandi and Maclanchlan (2006:1); Erhabor and Don (2016:5373); Newman and Fernandes (2016:170); Shay-Margalit and Rubin (2017:122) is the ability to create environmental awareness, environmental conscious and change values, attitude and behaviour towards sustainability environmental conservation within the community. The need to create environmental awareness is as a result of substantial studies that have shown that "people with high levels of environmental attitudes tend to act more pro-environmentally" as mentioned by Grúňová *et al.* (2017:4); Prati *et al.* (2017:176). Furthermore, the value of EE programmes has been justified by several publications dating as early as the 1990`s as well as by several institutions that are actively involved. Reddy *et al.* (2004:111) stated that EE as a practice is as old as human existence.

In South Africa there are over 300 institutions that are involved either directly or indirectly in EE programmes ranging from state and semi-state institutions, for profit and non-governmental organizations as reported by Cornwell (2009:82). Similar to findings by Rickinson (2001:207)

EE programmes that are currently implemented in South Africa are extremely diverse (Cornwell, 2009:83). The main focus of EE programme in South Africa is encapsulated by principle 4(q) of the NEMA (Van der Linde, 2010:38) which is to empower youth so that they can have a meaningful participation and make an informed decision regarding environmental issues. The aim has been adopted by the READ EE youth club programme.

The general approach for youth EE is through outdoor education or camps (Arnold *et al.*, 2009:34; Christensen, 1993:41; Grúňová *et al.*, 2017:3). Such youth EE programmes are designed in a way that there is integration of theoretical and practical learning by exposing youth to the environment at first-hand (Chawla & Cushing, 2007:1; Sousa *et al.*, 2016:13) by being exposed to adventure-based challenges e.g. anti-poaching, hiking trail, and flora and fauna identification. The following are characteristic of an excellent EE programme as stated by Thomson and Hoffman (2010:11):

- There are generally credible, have a good reputation and are based on solid facts; traditional knowledge or science is an integral part of the programme. Have strong values; biases and assumptions are made clear.
- Focus on creating a wealth of knowledge and general understanding about social, political and ecological concepts. Have created and can demonstrate sustainable economic environmental utilisation.
- Follow adaptive management approach for the entire programme that integrate improvement through the design, delivery, evaluation, and redesign.
- Focused on practical and the real world that is, on time, specific to age, relevant curriculum integrated into outdoor adventures.
- Are creative and provide hands-on experience focused on learners.
- Create enjoyable, stimulating, exciting situations.
- Tend to approach environmental challenges on a broader scale.
- Focus on motivating and providing specific skills and knowledge through specific action.
- Have an engagement programme that is long-term focusing on mentoring.
- Encourage learners to learn and understand their past, sense of the present and postulate positive future prospects.

2.6. Models of Responsible Environmental Behaviour

Because of EE disciplines and progressive development over the past years, numerous models were formulated (Cooke *et al.*, 2016:159). The eventual goal emphasized for education is to shape human behaviour throughout the world. It does so by producing citizens that are tailored to behave in a particular predetermined manner as stated by Chawla and Cushing (2007:9); Hungerford and Trudi (1990:257). South Africa is perpetually in a dilemma with the majority of higher learning institutions continuing to produce graduates who wait to be employees and most courses are not relevant for current economic development, which is maintaining the apartheid Bantu Education system approach. Empirical research on EE has led to the formulation of simple and complex models with the aim of providing a framework upon which complex concepts can be simplified. The current section has covered basic models deemed to be relevant for the current study.

2.6.1. Linear Model

Originally, the thinking within the EE field was that environmental citizenry is based on a linear traditional model. EE was based on the idea that behaviour can easily be changed though gaining more environmental knowledge as illustrated in Figure 2.1. The idea was founded on the assumption as mentioned by Hsu (2004:37); Hungerford and Trudi (1990:258) that responsible environmental behaviour (REB) is as a result of change in attitude due to more environmental knowledge. In the same vein, traditional thinking there is a link between knowledge to attitude and attitude to behaviour has been advanced. Cooke *et al.* (2016:161) have since identified two types of attitudes relevant for environmental citizenry namely "attitude towards nature itself and attitude towards pro-environmental behaviour". They further stated that if environmental awareness (attitude) is reinforced by actual pro-environmental behaviour, the term environmental responsibility is more relevant.

In simplicity, the earlier widely accepted linear model was expressed by Hungerford and Trudi (1990:258) in the following manner "increased knowledge leads to favourable attitude… which in turn leads to action promoting better environmental quality". Recently research findings have clearly shown that environmental citizenry behaviour is much more multifaceted than knowledge alone (Chawla & Cushing, 2007:1) which leads to its validity being questioned (Newman &

Fernandes, 2016:154). Johnson and Činčera (2016:97) mentioned in their findings and concluded that association between attitude and personal behaviour change is intricate. The recent reasoning is supported by assertions clearly articulated by Cooke *et al.* (2016:162); individuals who are environmentally knowledgeable and aware, do not automatically behave in a pro-environmental manner. Furthermore, such assertion was also supported by a negative correlation coefficient (r = -0.078) between students' knowledge and their attitude towards EE during the study conducted in Nigeria by Erhabor and Don (2016:5373).

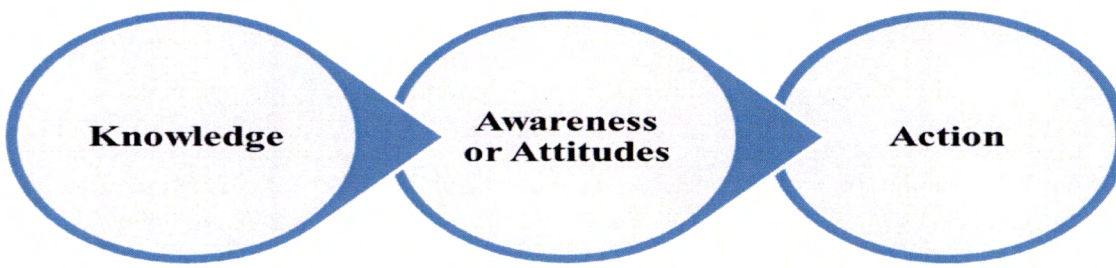

Figure 2.1. Illustrate the behaviour change system adapted from Hungerford and Trudi (1990:258)

Because of the early linear model, which was widely accepted, a lot of EE research has focused on either evaluating knowledge, attitude and evidence of environmental action from participants as potential evidence of the impact of various EE programme initiatives on participants. Indeed the model was strongly supported to a certain extent by the findings such as those by Johnson and Činčera (2016:98) that a much stronger effect on behaviour was observed to be from attitude than knowledge after testing 2 000 adolescents. As early as 2009 the study conducted by Cachelin *et al.* (2009:3) already indicated the limitation of using cognitive outcomes to evaluate EE initiatives and had recommended the integrated approach which included effective responses. Figure 2.2 serves to illustrate diagrammatically possible links of environmental behaviour with other influencing factors as adapted from Mohamed (2016:8). It is important to note is that information, together with personal experience, leads to values which, when internalised, develop into beliefs. When beliefs are combined with skills, opportunities and locus of control this culminates into behaviour.

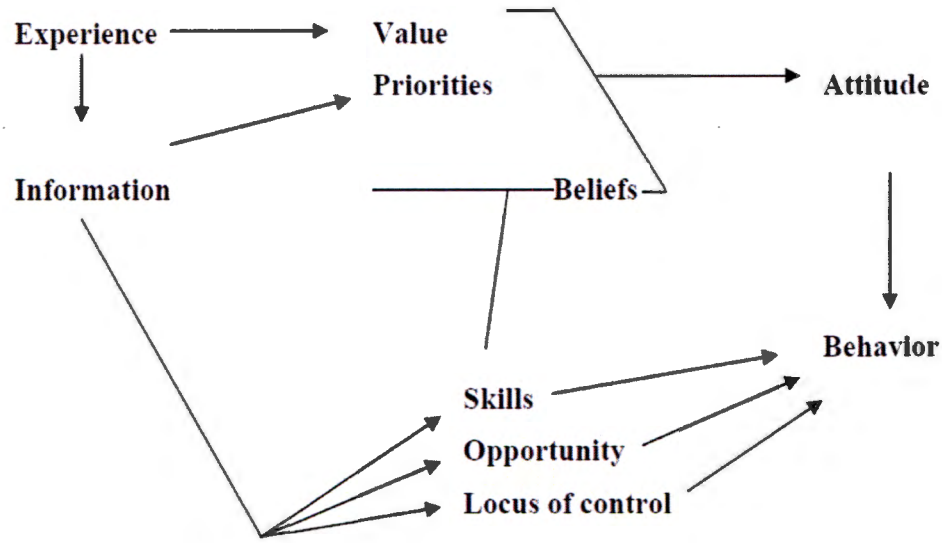

Figure 2.2. Factors which influence environmental behaviour of people sourced from Mohamed (2016:8).

2.6.2. Comprehensive Behaviour Change Model

As more and more intensive research on EE was conducted it became clear that the earlier model was too simple. The game changer model on EE was proposed in the early 1970`s and was commonly referred to as the Hines model or comprehensive behaviour change model. The Hines Model was a result of assessments of various variables which are related to responsible environmental behaviour and has been supported by empirical data supporting the relationship. It has since provided a possible analysis of at least fifteen major categories of variables associated with the environmental citizenry and "strength of their association with environmental behaviour" as stated by Hungerford and Trudi (1990:259) and indicated in Figure 2.3.

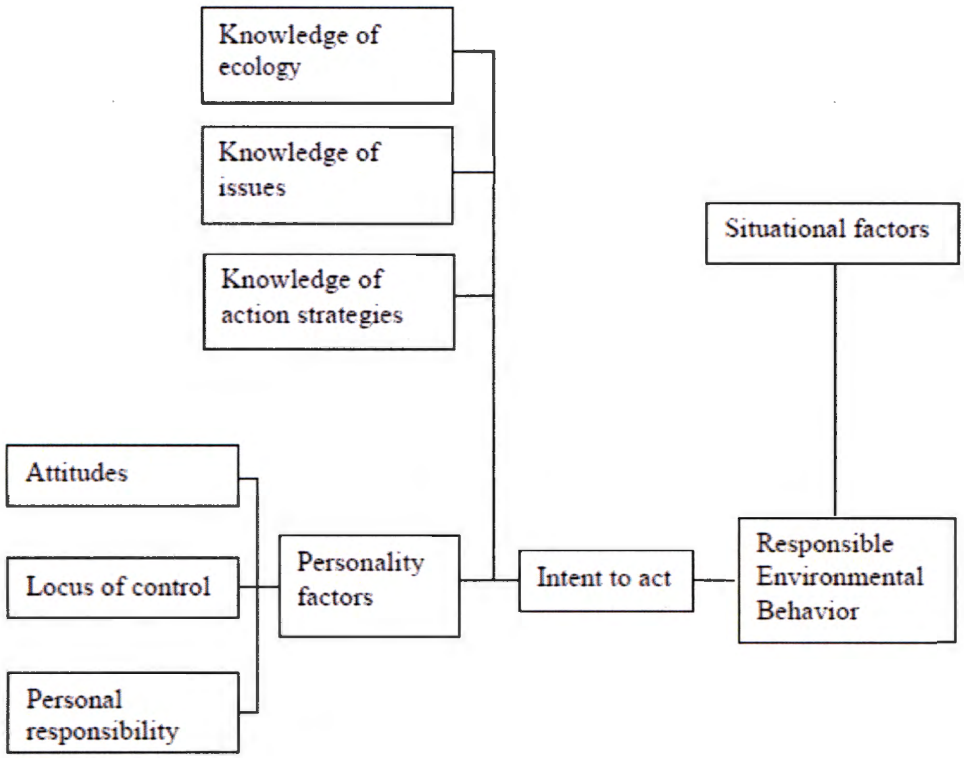

Figure 2.3. Illustrate comprehensive behaviour model of responsible environmental behaviour sourced from Hungerford and Trudi (1990:259); Kinder (2012:3).

i. Intention to act: The assumption was based on the comparative analysis between two individuals intentions expression, with the one having a higher intention being likely to engage in the action compare to one with no intention. Other mixtures of variables act synergistically such as cognitive knowledge, cognitive skills and personal factors influences intentions.

ii. Knowledge: The knowledge assumption is based on the idea that for one to act on any environmental problem, knowledge of the existence of such problem is essential. Furthermore, an individual needs to cognitively possess and know possible remedial actions that are feasible, relevant, effective and applicable to solving the problem.

iii. Action skills: The assumption is also directly linked to knowledge in that one need to possess the required skills in order to execute appropriate relevant action to resolve identified environmental problems.

iv. Personality factors: The assumption is centred around the personal aspiration to be involved. It is influenced by many personal attributes such as attitudes, the locus of control, roles and responsibility.

v. Situation factors: The assumption is based on factors that are likely to influence individuals positively or negatively in engaging in an environmental related programme such as economic constraints, social pressures. The findings by Jackson *et al.* (2016:77) refer to age and gender as social factors as the major possible factors determining attitude and behaviour.

Environmental citizenship behaviour flowchart model; major and minor variables involved in environmentally responsible behaviour model

As a result of continued influence on EE by research, there are now three major categories of variables known to have a bearing on behaviour as illustrated in Figure 2.4.

i. Entry-level variables

- Environmental sensitivity: has generally been found to have a positive correlation with the environmental citizenry. It is defined as having a sympathetic outlook towards the environment by individuals.

- Androgyny: variable that has been found to be more common among individuals who are environmental activists in pioneering tangible environmental solutions. Such individuals are said to typically not follow traditional sex-role related phenomena.

- Knowledge of ecology. Once more cognitive knowledge is positively correlated to sound decisions pertinent to providing relevant solutions. More specifically, ability to comprehend ecological conceptual basis as part of systematically synthesizing decisions.

- Attitude toward pollution / technology / economics. Similar to the Hel model, individual attitude has been found to have a relationship with behaviour. However, the extent to which this is involved is not clear.

ii. Ownership variables

The feeling of environmental ownership plays a major role in the behaviour of individuals towards the environment. It has been linked to the following two variables:

- In-depth knowledge. For one to engage and participate meaningfully, knowledge and understanding of matters at hand, its ecological and economic impacts, both negative and positive, at a personal level is crucial. Hence emphasise the empowerment of individuals through EE.

- Personal investments. The variable is linked directly to action with the assumption that one is likely to be associated with pro-environmental citizenry behaviour with the knowledge that there is a potential to lose or gain at a personal level. It is typical with those individuals who invest in green energy initiatives and recycling who see a direct benefit from such investment.

iii. Empowerment variables

The variables are critical in instilling responsible environmental citizenry within the community. They provide capacity and courage for the community to make strides and contribute more meaningfully. They are the centre of major EE programme worldwide.

- Perceived skills in using environmental action strategies. This refers to a hands-on training approach focusing on strategies that are critical in resolving environmental problems; it leads to high self-confidence which cascades down to environmental citizenry. Such approach was also used in the Earthkeeper programme in the United State of America, which was a research study evaluated by Johnson and Činčera (2016:98) in their own words "which focused on feelings, providing rich, first-hand experiences that help children build personal connections to natural works in order to help them develop positive environmental attitudes". Furthermore, the study by Bergman (2016:480) also found that five percent of participants gained environmental knowledge through EE which includes practical experience. Sousa *et al.* (2016:10) also concluded his findings by saying that the pond-EE based on hands-on experience led to improved knowledge and attitude, whereas findings by Jackson *et al.* (2016:70) suggest that geographical context is actually the main determinant factor. On the contrary, research by Johnson and Činčera (2016:102) found that enjoyment of nature as part of EE programme yielded a small non-statistically significant improvement in the attitude of participants which therefore was indicated to be of no value for an environmental behavioural change.

- Knowledge of environmental action strategies. There seems to be a complementary relationship on how knowledge of environmental action strategies and perceived skills influence behaviour.

- Locus of control. Internal locus of control refers to the inner feelings which propel and give confidence for one to prosper. The assumption that EE will then reinforce inner feelings, making it easier for such individuals becoming environmental citizenry, was supported by findings from the study conducted by Johnson and Činčera (2016:106) which showed participants who had a more pro-environmental internal locus of control tend to be more likely to earn the Y ket. It was validated by a study conducted by Bergman (2016:480), who found that personal distinctive interest seems to play a major role, as well as the study conducted by Erhabor and Don (2016:5373) in Nigeria with a pro-environmental mean of 13.42, higher than 12.27, whereas individuals with a low external locus of control may not respond to EE in a positive way. This is more apparent in the case where changes are required and if one feels powerless it is highly probable that status quo will remain.

- Intention to act. The assumption is based on the general observation that it is easier for a person to take action if there is an existing intention to take it.

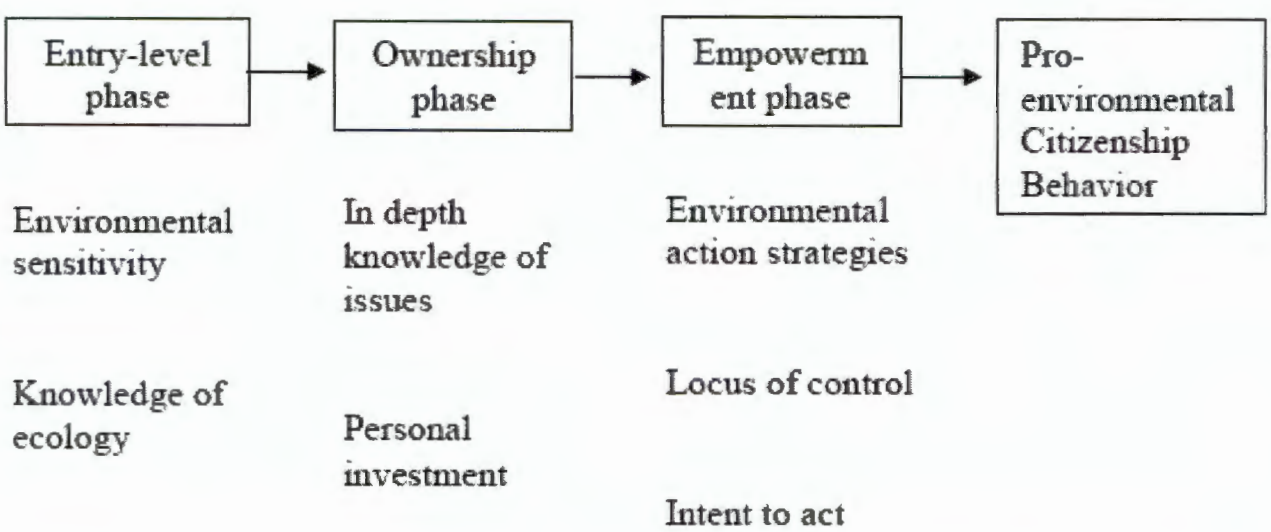

Figure 2.4. Illustrates Environmental citizenship behaviour flowchart model: major and minor variables involved in Environmental responsible behaviour sourced from Hungerford and Trudi (1990:206); Kinder *et al.* (2015:4)

2.7. Conceptual Framework for Understanding Children`s Experience with Nature

In gaining more clarity and explanation, psychologists and social scientists were included in EE research in order to deepen the understanding of the relationship that exists between environmental awareness (attitude) and behaviour (Cooke *et al.*, 2016:161; Newman & Fernandes, 2016:153). The importance of conceptual framework is gaining momentum within the field of EE as a result of its ability to ascertain, foretell and control variables associated with environmental behaviour and concern (Newman & Fernandes, 2016:153).

2.7.1. Multidimensional Model of Experience

EE is generally classified under the study of experience and commonly considered not to fit under traditional scientific research. From theories of psychology and child development, there are four dimensions of experience as illustrated in Figure 2.5. Understanding and integration of the four dimensions of experience are pivotal for an effective and efficient EE programme. It is more so because knowledge can be acquired and enforced through each of the four dimensions. The four dimensions of experience include sensory (information gained by applying senses), affective (emotional assessment), cognitive (thoughts) and behaviour (actions) (Linzmayer *et al.*, 2013:482). As stated by Verma (2016:184), good environmental education is not only about the transfer of knowledge and information; rather it integrates physical interaction with nature through outdoor experience in developing environmental sensitivity and awareness. It further agreed with research conducted by Ozdemir (2016:152.) in Erbil that actual ecological activities have a major influence in instilling environmental citizenry. It does so as supported by the research study from Johnson and Činčera (2016:108) through emotional experience gained by participating in natural activities integrated within EE. As later stated by Johnson and Činčera (2016:108) in their own words "experiential, emotionally loaded activities aimed at establishing the bond between children and nature might be crucial instructional strategy for shaping environmental attitudes and behaviour"

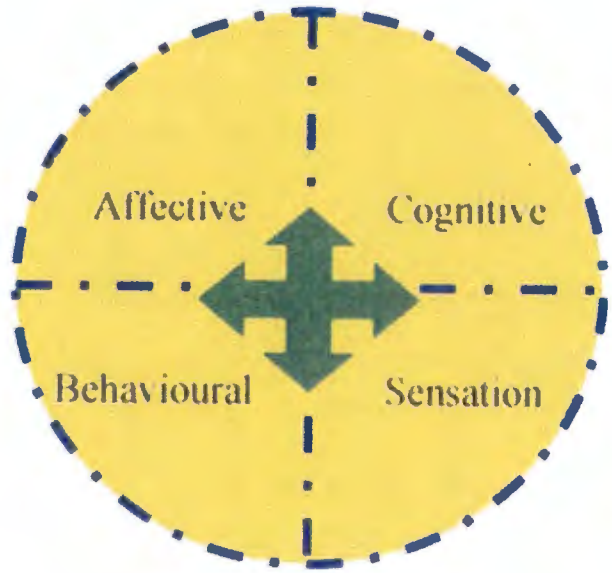

Figure 2.5. Multidimensional Model of experience sourced from Linzmayer *et al.* (2013:483)

2.7.2. Experiencing Nature Model

The mode integrates all four dimension of experience mentioned under 2.6.1 and illustrated in Figure 2.5 above. It further segregates four dimensions of experience into an internal sphere (affective, sensation and cognitive processed internally) and external sphere (behaviour being observable external social environment) (Linzmayer *et al.*, 2013:485) as indicated in Figure 2.6.

Social variables investigated by Newman and Fernandes (2016:169) were found to be able to a limited extent able to clarify environmental concern at a range of 8 -19%. The social variable considered were age, social class, place of residence, political belief and gender.

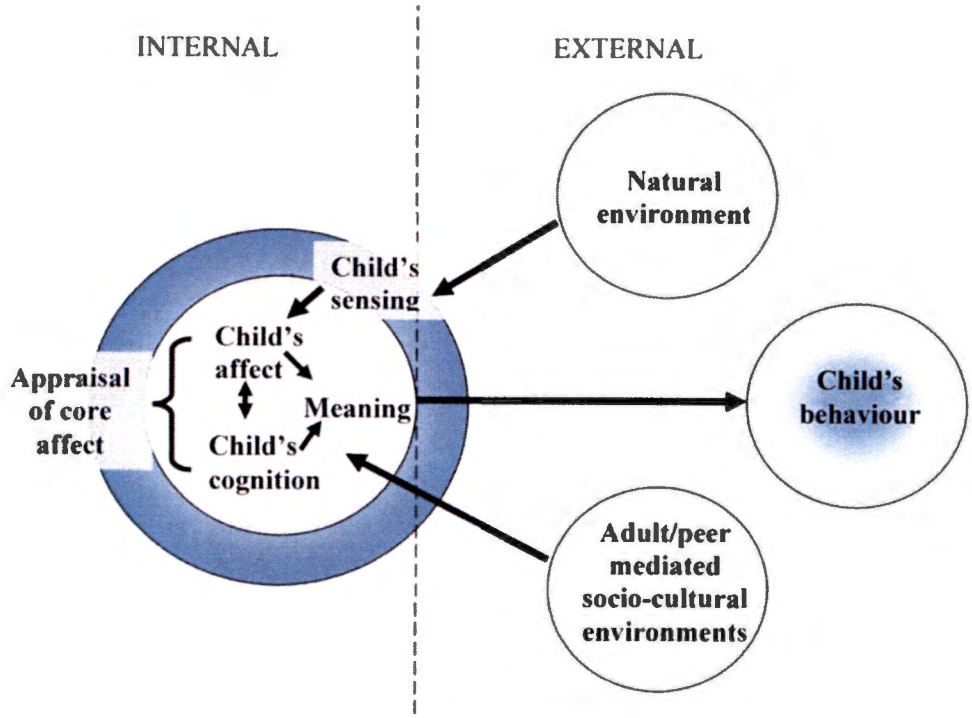

Figure 2.6. Experiencing nature Model sourced from Linzmayer *et al.* (2013:485)

2.8. Evaluation of Environmental Education

According to Salvatierra da Silva *et al.* (2016), comparison with other programmes has found evaluation to have a short history within the field of EE, with few institutions implementing EE having done systematic and meaningful programme evaluation. Results from Google scholar search have shown a large number of publications on the evaluation of various EE programme. To affirm the notion, publications by researchers such as Smith-Sebasto and Semrau (2004); Walsh-Daneshmandi and Maclanchlan (2006); Salvatierra da Silva *et al.* (2016); Bergman (2016:480); Komane (2005) bear testimony. Thomson and Hoffman (2010) introduced the concept of evaluation by saying that it is a scary word which, when mentioned, people generally feel that there are going to be judged and are therefore likely to feel personal about it. He further defined evaluation as "a systematic assessment of the operation and or the outcomes of a programme or policy, compared to a set of explicit or implicit standards, as a means of contributing to the improvement of the programme or policy".

As mentioned by Kil (2016); Thompson *et al.* (2002:6); Thomson and Hoffman (2010), there is an increasing need globally for accountability and performance measure both from public and private funders and the EE programme is not excluded. The statement by Cooke *et al.* (2016:159) supported this; "measuring of environmental awareness based on scientific criteria is becoming increasingly interesting to scientists working in different disciplines; only things that can be measured can actually be managed". Globally the tendency is to ensure that there is value for money. Within the South African context, because of accountability and limited financial resources, government has put more emphasis on monitoring and evaluation; this has been more apparent by the establishment of a monitoring and evaluation portfolio within the presidency office (Ramafolo, 2012:13).

Systematic evaluation of EE programme has direct benefits by improving the programme as stated by Salvatierra da Silva *et al.* (2016:322), which can be linked to teaching or delivery approach, learning activities and instruction resources as per findings by Christensen (1993:78). EE programme evaluation can also assist a programme to see if objectives and goals are met, and provide a mechanism for improvement and achieving goals such as growth in participants learning by improving learner's knowledge, change in attitude and behaviour (Christensen, 1993:79; Grúňová *et al.*, 2017:14); (Johnson & Činčera, 2016:97); Thomson and Hoffman (2010). It can also assist in identifying participants` learning needs and measuring participants' achievements, improve environmental management according to Carleton-Hug and Hug (2010:121) and Christensen (1993:79). Furthermore, EE evaluation can greatly assist in the improvement of logistic support of the entire programme e.g. planning, implementing the plan, communication, marketing and getting funding, reporting and monitoring and evaluation. As stated by Christensen (1993:27) and Salvatierra da Silva *et al.* (2016:312) it can importantly increase EE programme credibility. The list of key success factors derived after EE evaluation research conducted by McDuff (2002:394) is as shown in Table 2.1.

Table 2.1. Success factor sourced from research conducted in Kenya by Mallory McDuff (2002:394)

- Motivated innovators at the grassroots level who initiated programme
- Partnerships with leading conservation organization and donors
- Involvement in high-profile conservation issues at inception
- Establishment of wildlife clubs in other countries
- Providing opportunity for Kenyan students to visit their national parks
- Influence on students` careers through experiences in wildlife conservation
- Restricting organization and decentralization of Wildlife Clubs of Kenya in the 1990s
- Establishment of endowment fund

There are currently different methods that are used to evaluate or assess EE programme. These are formative and summative evaluation methods which focus on evaluating curriculum as stated by Thomson and Hoffman (2010:15); Artun and Özsevgeç (2016:7321) and Granit-Dgani *et al.* (2017:269). The formative evaluation products or outcomes are generated during the project life cycle and are fed back to the project to improve it, whereas summative evaluation is done at the end of the programme providing effectiveness information; Outcome and processes based evaluation methods focus on the results or impacts of the programme. According to Artun and Özsevgeç (2016:7319); Thomson and Hoffman (2010:3), outcome-based evaluation methods are gaining momentum and popularity among funders and the non-governmental community. In the case of EE programme, the outcome generally refers to the benefit gained by the targeted beneficiaries. The systematic assessment of what is going on in a programme is also important, which usually involves evaluating the entire programme department by department. The outcome-based evaluation is important for the current study because it can shed light in finding out if the current EE youth club programme activities, which READ is implementing, are the relevant and correct ones to bring about planned outcomes. The expectation is that the outcome should be enhanced environmental knowledge, literacy and awareness, and skills. Traditional testing evaluation methods are generally known to provide feedback on the learning experienced by participants that focus on evaluating comprehension and memory through written or oral tests.

Such tests are usually done pre- or post-exposure to the programme. Cost-benefit analysis is a comparative analysis using the total cost of implementing the project against the total benefits derived because of the intervention. It is the total cost incurred for the implementation of EE youth clubs programme vs. benefit (in monetary value) gained by participants. Programme logic analysis: as stated by Thomson and Hoffman (2010:20) and similar to the assessment of Blue-throated Macaw EE Project in Bolivia conducted by Salvatierra da Silva *et al.* (2016:313) it is usually used for planning and managing the programme. It generally provides a clear picture on what the programme is doing and what they are changing. It is considered to have logic due to the logical link between the entire programme components. Inputs are materials and resources that are used within a programme when conducting activities e.g. equipment, staff, facilities, budget. Activities are the actual action that is done in order to create change e.g. flora and fauna identification. Outputs are the immediately achievable results, which can be directly linked to the activities. Outputs have the potential to meet desired results e.g. the number of youth within a departmental database or number of youth who attended camp. Outcomes are the true and actual benefits, changes brought about by the EE programme, that can be expressed in terms of environmental education literacy, knowledge, skills, values, attitude and behaviour change. Impact refers to the long-term vision of the entire EE programme. As stated by Thomson and Hoffman (2010:22) the success of EE Programme can generally be determined by measurement using any selected indicators that evaluate any or all of the three logic model components using instruments such as questionnaire or surveys. Other models that can also be used include needs assessments, effectiveness assessment, goal-based assessment and process-based assessment.

Of importance when evaluating field EE programme as stated by Cachelin *et al.* (2009:7) is the integration of various approach using variables that measure cognitive outcomes and effective responses in order to get a meaningful in-depth response pattern analysis. This was strongly supported by his results that showed different responses between classroom and field-based participants.

The biggest challenge noted by the studies conducted by Granit-Dgani *et al.* (2017:271), Carleton-Hug and Hug (2010:164), Christensen (1993:47) and Thomson and Hoffman (2010:48) for the evaluation of EE programme is time, and the fact that EE programme cover a diverse

field and are harder in comparison to traditional learning. Christensen (1993:43) suggested a solution to avert the situation by integrating evaluation as an integral part of the entire EE programme. He further stated that the evaluation of the EE programme must include a decision on what is to be evaluated, a plan on how is going to be done, an implementation plan and a loop feeding back the results into the EE programme. The harder part of an EE evaluation programme is due to the fact that is not easy to measure attitude and change in behaviour over a short period. However, Thomson and Hoffman (2010:14) highlighted that evaluation of an EE programme can only be focused on two areas, namely the activities (how it`s delivered, by whom, when, how) and outcomes (skills, knowledge, attitudes, values changes).

The following are reasons suggested by Christensen (1993:46) that lead to failure of EE programmes:

- Broadly defined EE objectives
- Lack of defined and focused educational delivery approach
- Focused on short-term issues while undermining the long-term lifestyle decisions
- Lack of integrity by accepting funds from the companies that are causing major environmental degradation
- Lack of programme identity from existing ones

Christensen (1993:78) emphasized that evaluation of EE programme should be "a basic and ongoing element of effective programme". He continued by stating that the goal of evaluation is to improve teaching/learning process which is characterized by effectiveness and efficiency. Effectiveness relates to the outcome of EE education, which is directly linked to learners both through changed attitude and through behavior, whereas efficiency relates to the methods used for delivery both in terms of cost and time required. Thomson and Hoffman (2010:5) are of the opinion that an appropriate EE programme evaluation method is the one that measures the success of the EE programme with learners at the centre.

2.9. Environmental Education Programme Implemented by READ

According to the draft North West Environmental Youth Club`s Support Strategy (READ, 2012), there are at least 48 EE youth club established with membership of 110 membership in 2013. Similar to other worldwide EE initiatives the first three main objectives contained within the draft EE include:

- to increase environmental awareness by assisting "environmental youth clubs to acquire awareness and sensitivity to the total environment and its allied problems",
- to increase environmental knowledge by "helping environmental youth clubs gain a variety of experiences and acquiring a basic understanding of the environment and its associated problems", and
- to increase environmental attitude among youth by helping "environmental clubs acquire a set of values and feeling of concern for the environmental and motivation for active participation in its improvement and protection".

The first two above listed READ EE youth club programme objectives are met through:

- environmental awareness; by recruiting new EE youth club members and encouraging membership renewal with the issuance of membership certificates and providing support with the overall target of establishing 15 new clubs with 225 members per annum. The various EE youth club will be supported with presentations which will shed light on and provide solutions to local problems, and
- observance of environmental calendar days; EE clubs are supported both at provincial and district level on quarterly basis in observing the international days for Biodiversity, World Environmental day, World habitat day, World wetland day. The department covers 55% of the total cost.

The third objective of READ EE youth is to provide opportunities to participate in sustainable development, which is similar to other international EE programme and activities as conducted in Sudan from the research study by Mohamed (2016:8). The third objective is attainable through:

  - capacity building and empowerment; by providing an opportunity to participate in sustainable development which is met through:

- individual EE youth club workshops aimed at providing administrative capacity for the efficient and effective management of individual EE youth clubs,
- district workshops through which executive members are trained on various environmental issues, concepts and trends. The department covers 50% of the entire costs,
- district camps through which EE youth club members are encouraged to share ideas, experiences, successes and progress of individual clubs involved in sustainable living. The department covers 50% of the entire costs,
- provincial EE youth club camps where EE youth clubs share ideas on various issues regarding poaching, waste management, water quality and career guidance which seemed to follow a similar approach as studied by Johnson and Činčera (2016:99). The department covers most of the costs related to the camp,
- individual EE youth club projects, that are related to the environments such as waste sorting, recycling and eco-parks. The clubs are conferred with certificates with the overall winner receiving a district award, which is similar to the approach followed in Eco Clubs in India as stated by Verma (2016:184).
- district environmental EE youth club projects. The department provides starter kit to four district projects annually to compete, with the winner receiving an award for provincial best environmental club project which is similar to the activities proposed by Ozdemir (2016:161) and
- provincial EE youth club Indaba. It is organized bi-annually with the aim of developing and adopting EE youth club strategy. The department covers 50% of the total cost.

2.10. Summary

Environmental degradation occurs because of pressure exerted on natural resources, either water, air, land by humans, which far exceeds carrying capacity. It is on that basis it can no longer be business as usual. There has since been an emphasis on EE worldwide from both government and NGOs. EE provides a long-term solution by changing attitudes and behaviour towards the environment. Such programme are targeting youth so that they can be actively involved in local

and global environmental issues. Due to limited resources in both government and funding institutions, there has been a need to provide scientifically based evidence that there is value for money from EE programme. The theoretical framework for EE has evolved over the past years. The ealier studies on EE were based on a linear model, and has since progress to a much more comprehensive and multidimentional models. Of recent study has shifted towards an experiencing nature model, which emphasised the practical exposure. It has been shown that learners are able to comprehend complex environmental concept through practical. The next chapter will provide research methodology as a framework used for the collection and analysis of current study data. The study uses both qualitative and quantitative research methodology.

CHAPTER 3 RESEARCH METHODOLOGY

3.1. Introduction

This chapter outlines the framework used for the collection and analysis of current study data. Research is defined as a systematic approach of finding solutions to an identified problem. Sections 3.1 of the current chapter outline the reason why mixed research methodology was followed in conducting the current research study. Furthermore, the chapter under section 3.2 clarifies two distinct research populations targeted for sampling. The current chapter also provides two study techniques (questionnaire and desktop analysis) used when collecting data under section 3.3. Section 3.4 of the current chapter indicates the quasi-experimental design used based on survey and desktop analysis of secondary data. The chapter also outlines the procedure followed in satisfying the North West University Ethical Committee requirements under section 3.5. It further provides ethical clearance compliance as required in terms of North-West University. Section 3.6 provides the detailed framework followed for data analysis.

3.2. Study Area

According to Bryman and Bell (2015:381); Gomez and Gomez (1984:533); Levin and Rubin (1981:9); Sheldon (2005:5); Weiss (2012:4), population is defined as units from which a research sample is to be collected. The current study had two different targeted units of study. The first unit of study consisted of youth from high primary and secondary school respondents from four North West Province districts as indicated by Figure 3.1. For the purpose of statistical power and standardization, the criteria followed when selecting respondents was the enrolment in an EE youth club. The respondents were selected such that there was a gender balance. The targeted population included a total of one thousand one hundred and four (1 104) registered EE youth club members according to the 2013 database. The unit of analysis was sampled such that fair representative of a targeted first unit of study was achieved with at least 3% margin of error at 95 confidence level.

Figure 3.1. The map showing the current research study area

The second unit of analysis was the READ officials who are responsible for the management and implementation of EE youth clubs within the North West Province as shown in Figure 3.1. The READ respondents were selected based on their being direct involved and having first-hand information on EE implementation. The estimated total targeted population was seven (7) officials.

However at the time of sampling which was done during a camp, 100% of youth who participated in the EE youth camp that was held at Borakalalo Nature Reserve were sampled, whereas only 89% of participants during the Provincial camp at Rustenburg were sampled. The unequal representation of district municipalities was because of logistic arrangements of transporting EE youth club members to camping areas. The second attempt of getting more participants from the other three district municipalities could not yield desired results.

3.3. Research Design

In this chapter, the study adopted a mixed research method which pooled both qualitative and quantitative data collection based on a review of current practices and similar studies. The qualitative and quantitative methods in the current study complement each other in minimising potential biases (Bryman & Bell, 2015:56). According to Bryman and Bell (2015:31), qualitative research is centred around words in collection and analysis of data whereas quantitative research is based on numbers. The collection of qualitative and quantitative data was done separately. Most of the qualitative questionnaire data were collected between June-August 2017 and the quantitative desktop data were collected from May to August 2017.

3.4. Sampling Procedure

The first set of CATES and CCROT questionnaire were administered to EE youth club individuals, who are beneficiaries, by the researcher with the assistance of READ officials who are responsible for implementing the EE programme (Appendix 3.1). The distribution of questionnaire was done during EE camps at Bojanala District Municipality in a similar approach to focus group. The semi-focus group was constituted of ±15 respondents in a similar was as indicated by Figure 3.2. The questions were read by respondents and interpreted by peers together with the researcher. Any necessary further explanation was done using Setswana, which is a local language. Another set of questionnaire was distributed during the EE youth club camp that was held in Rustenburg. Respondents were Youth who responded voluntarily and were not compensated for their participation.

Figure 3.2. Picture showing respondents completing questionnaires during the EE youth club that was held at Borakalalo Nature Reserve.

The second set of self-administered open-ended EE programme evaluation questionnaire were distributed via email to READ officials responsible for the EE programme. READ officers were given sufficient time to complete the questionnaire and return them back to the researcher via email (Appendix 3.2).

The access to secondary data was requested from the READ, and facilitated by the programme manager. READ annual reports were accessed through the internet and those indicators which are relevant for the current study were analysed by extracting information.

The major challenge experienced during the distribution of the questionnaire was at an EE youth club camp which was held in Rustenburg. It was because of respondents who were coming from a special school, who required sign language.

3.5. Data Collection

The data collection method used in the qualitative survey study was valid and reliable self-administered questionnaire collected through two sets of standardised questionnaires and desktop

analysis. The questionnaire had two sections (a) details of the EE youth club, demographic age and gender, residential area and name of the district; and (b) attitude scale and concern rating scale. The first questionnaire was a 1-page structured survey consisting of nine (9) Likert-type scale closed-ended questions addressing Children`s Attitude Towards the Environment Scale (CATES) adapted from a similar study conducted by Musser and Malkus (1994:23) which has internal consistency reliability ranging from 0.70 to 0.85 and an acceptable test-retest reliability of r = 0.68. The CATE was administered to measure attitude and for the behaviour of youth who are participating in an EE youth club.

The second questionnaire was a 2-page Likert-type scale closed-ended questionnaire containing 1 question with ten (10) sub-questions measuring the children`s concern using the Childhood Concerns Rank Order Task (CCROT) adapted from a similar study conducted by Malkus and Musser (1997:10), as a way to capture factors influencing youth to participate in the EE youth club programme.

The second set of questionnaires is a 1-page survey consisting of thirteen (13) open-ended questions used in the evaluation of the EE programme. The second questionnaire was divided into two sections (a) containing details of the READ respondents including designation, regional office and number of year in service. The questionnaire section (b) is further subdivided into the following subheadings; activities with three (3) questions; output with four (4) questions; inputs with three (3) questions; outcomes with two (2) questions; impact with one (1) question; and general with nineteen (19) questions. The second questionnaire was circulated via email to READ respondents and they were requested to reply within two months.

The data collection method used in the quantitative desktop analysis was a reliable approach in collecting secondary data. The desktop analysis which was done by extracting relevant secondary data from the Annual Plan of Operation (APP) and Annual Report was done in assessing the level at which targets were met in terms of number of EE youth clubs established, membership and demographic statistics in terms of age and gender.

3.6. Data Analysis

The data analysis was done using Statistical Package for Social Science (SPSS) version 24. The descriptive and exploratory data analysis was conducted in describing samples in terms of

biographic data. Independent sample T-Test was used in determining difference due to gender. Furthermore, One-Way Analysis of Variance (ANOVA) was run to examine the difference in attitude and concerns ranking tasks order between respondents in terms of gender, age and residential district municipality.

3.7. Reliability and Validity Consideration

According to Bryman and Bell (2015:36), reliability is concerned with the ability to measure concepts consistently which is composed of three factors (stability, internal reliability and inter-observer consistency). The Cronbach`s alpha was used to measure the internal consistency (reliability) of multiple Likert-type scales and items for CATES and CCROT. The screen plot for CCROT and CATES items was used to measure validity. Pearson Product Moment Correlation was conducted in determining the validity of the questionnaire used with the item-item having significant total score indicating items to be valid.

3.8. Ethical Requirements

According to Bunker (2010) the definition of ethics dates back to Plato and Aristotle is derived from the Greek word ethos, meaning character, conduct and or customs, whereas Starling (1986:145) define ethics to be principles, values and beliefs that define what is right and wrong behaviour. On the other hand, Cameron and Stone (1995:74) and (Kuusela, 2010) define ethics as a branch of philosophy concerned with the intent, means and consequences of moral behaviour. In conducting the current research, the research team provided an assurance of confidentiality, anonymity and treated all participants with respect. No personal information was requested from participants. Permission for the research was granted based on the approval by the Human Resource Ethical Committee for the research project to be conducted, with reference number NWU-00466-17-A9.

3.9. Summary

The research used complementary mixed research methodology which pooled qualitative and quantitative methods for data collection and analysis based on previous research. Existing CATES and CCROT research instruments were used for data collection. The questionnaire were distributed during EE youth club camps by the researcher and via email to READ officials. The data was captured in Excel spreadsheets and exported to SPSS version 24 for further analysis.

The next chapters will provide results. The following section of chapters are arranged such that each chapter provides answers to the secondary research question. Section 4.1 provides descriptive statistics focusing on the demographics of respondents, Section 4.2 provide answers to research question whether the EE youth clubs programme implemented by READ change attitudes of youth towards the environment in comparison with results from other post-exposure studies using CATES as a research instrument. Section 4.3 provides an answer to the major concerns task ranking order for youth who are participating in the EE youth club programme using the CCROT research instrument and Section 4.4 uncovers if selected EE annual targets are being met from 2011 to 2016 financial year using closed-ended questionnaire and desktop analysis.

CHAPTER 4 RESULTS AND ANALYSIS

4.1. DESCRIPTIVE STATISTICS

4.1.1. Introduction

In this chapter, data analysis and presentation of descriptive statistical results will be discussed. Data sets were acquired through questionnaires. The first sets of questionnaire were distributed during the environmental youth club camps, as well as by officials responsible for the implementation of EE youth clubs during EE youth club meetings. A total of 434 respondents (consisting of 431 respondents who are beneficiaries EE youth club and 3 respondents from the first and second set of questionnaire respectively) were used in the analysis. The results are processed using Statistical Package for Social Science (SPSS) version 24. The bar and pie chart and graphs were used for data representation. Descriptive statistics on questionnaire will focus on section A which represent biographic information of respondents.

4.1.2. Biographical Information of the Respondents

The 431 questionnaire were received from respondents who are participating in the EE youth club programme implemented by READ. All respondents reside within the four district municipalities of North West Province. The respondents were willing to provide information.

4.1.2.1. Age structure and gender profile

The analysis presented in Figure 4.1, indicates a high number of respondents were found to be between the ages of 8 and 17 years. Most of respondents, 48.3% (n = 208) were between the ages of 8 and 12 years, followed by 31.1% (n = 134) between 13 and 17, 9.0% (n = 39) between 18 and 22, 2.6% (n = 11) between 23 and 27, and 1.4% (n = 6) between 28 and 32. Respondents in the age group above 33 years were the least at 0.2% (n < 5). The other 6.5% (n = 28) of respondents did not indicate their age.

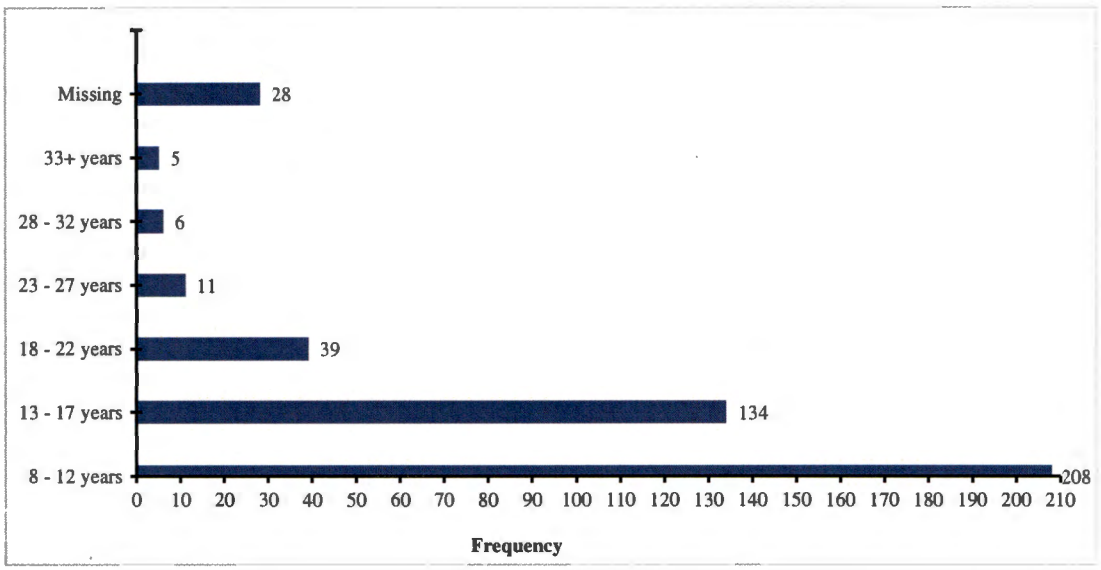

Figure 4.1. Represents age group distribution of Environmental Education club respondents

The sample comprised 416 respondents, as illustrated in Figure 4.2 with a pie chart. The majority of respondents were females 52.4 % (n = 218), and 44.5.8 % (n = 185) were males. The other 3.1% (n = 13) of respondents did not indicate their gender.

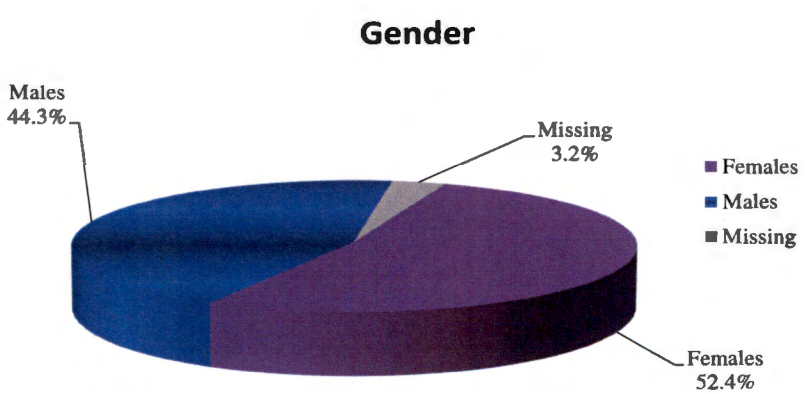

Figure 4.2. Illustrates gender profile of environmental education youth club sample

4.1.2.2. District municipality and residential areas

According to Figure 4.3, the majority of respondents indicated residing as follows; 60.6% (n = 261) in Bojanala Platinum District Municipality, followed by those who indicated residing 19.0% (n = 82) in Dr Kenneth Kaunda District Municipality, and 12.5% (n = 54) in Dr Ruth Segomotsi Mompati District Municipality, whereas Ngaka Modiri Molema District Municipality had the lowest number of respondents at 7.7% (n = 33). Only one respondent (0.2%) did not indicate residential district.

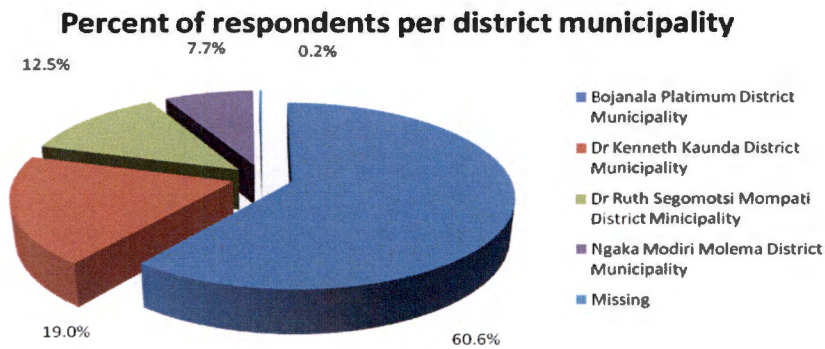

Figure 4.3. Represents the district municipalities from which respondents reside

The 431 respondents were found to be residing in 44 villages or towns as shown in Figure 4.4. The majority of respondents, 59.1% (n = 26) were from villages in Bojanala Platinum District, followed by Dr Kenneth Kaunda District Municipality with 34.1% (n = 15), Dr Ruth Segomotsi Mompati District Municipality with 4.5% (n = 2), and Ngaka Modiri Molema District Municipality having the lowest with 2.3% (n = 1). Figure 4.4 shows the number of respondents per village or town.

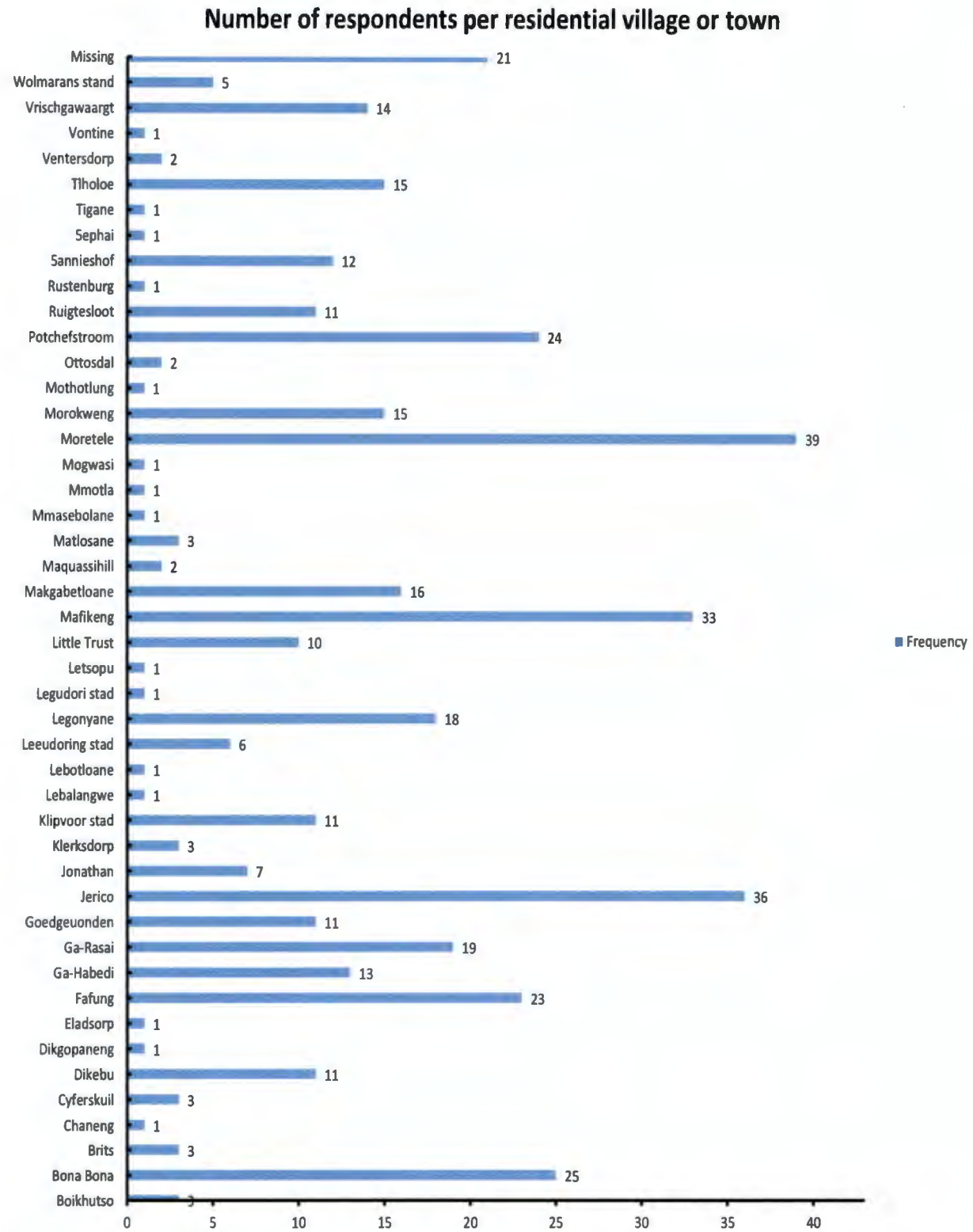

Figure 4.4. Illustrates the number of respondents according to residential areas

4.1.2.3. Environmental youth club/schools

According to the analysis, respondents were from 39 EE youth clubs/schools. It was observed that some respondents, 3.2% (n = 14) out of 431 could not identify themselves with the EE youth club of which they are a member but could relate to a school. Out of 39 EE youth clubs/schools 48.7% (n = 19) are from Bojanala Platinum District Municipality; 38.5% (n =15) from Dr Kenneth Kaunda District Municipality, 10.3% (n = 4) from Dr Ruth Segomotsi Mompati District Municipality, whereas 2.6% (n = 1) from Ngaka Modiri Molema District Municipality

The highest numbers of responses from the same EE youth club/school were between 26 and 33, which constituting two primary schools (Makgabetloane Primary School and Molelwane Primary School) with equal number of respondents 6.0% (n = 26), and two EE youth clubs (Morokweng EE club) with 6.3% (n = 27) and (Mecca EE) with 7.7% (n = 33) as shown in Figure 4.5.

The second highest group of responses from the same EE club/school was between 21 and 25, with one primary school (Lethabong Primary School) 5.1% (n = 22). The third group of respondents were found to have responses between 16 and 20, with two (2) primary schools (Gilbert Motsepe Primary School) 3.7% (n = 16) and (Ramashita Primary School) 3.9% (n = 17) and one (1) EE youth Club (Tlotlang Thuti EE Club) with 3.9% (n = 17) responses.

The fourth group with responses from the same EE youth club/school had respondents between 11 and 15 in total number, constituting five (5) primary schools, one (1) EE youth clubs and two (2) secondary schools as shown in Figure 4.5. Within the fourth group, three (3) primary schools (Mafale Primary School, Mmatlope Primary School and Tlholoe Primary School) had equal number of respondents of 3.5% (n = 15) each, which was the highest total number of responses, followed by one (1) primary school (Rantebeng Primary School) with 3.2% (n = 14). The least number of respondents from the fourth group were recorded from one (1) primary school (Disigwane Primary School) and one (1) EE youth club (Thusano EE Club) and one (1)

Secondary School (Poelane Secondary school) each with 2.8% (n = 12) and one (1) secondary school (Zacharia Makgatleng Secondary School) with 2.6% (n = 11).

The fifth group with the same number of respondents from one EE youth Club/school had between 6 and 10 responses, constituting of three (3) secondary schools, four (4) primary schools and two (2) EE youth clubs as shown in Figure 4.5. The highest number of responses received from the fifth group had three (3) primary schools (Charles Mamogale Primary School, Klipvoor Primary School, and Mashilo-Matsho Primary School), one (1) secondary school (Gatelapele Secondary School) and one (1) EE youth club (Bona-Bona EE Club) each with 2.3% (n = 10) number of respondents. After which they were followed closely by two (2) primary schools (Setumo Primary School and Ramaifala Primary School) at 2.1% (n = 9) each. The least number of respondents were recorded from two (2) secondary schools (Ikalafeng Secondary School and Seiphimelo Secondary) and one (1) EE youth club (Yard EE Club) each with 1.6% (n = 7).

The sixth group which had the lowest number of respondents from same EE youth club/school ranging between 1 and 5 as illustrated in Figure 4.5, consisted of two (2) secondary schools, one (1) primary school and eight (8) EE youth clubs. The largest number of respondents within the sixth group came from three (3) EE youth clubs (Small Five EE Club, and Tiragalo EE Club, and Tshwaraganang) with 1.2% (n = 5) each, followed by two (2) EE youth clubs (Kgakala EE Club and Motaung EE Club) each with 0.9% (n = 4). The least number of respondents were from three (3) EE youth clubs (Glenco EE Club, Matlosane EE Club and Oasis EE Club) and one secondary school (Realeka Secondary School) each with 0.7% (n = 3) and one (1) primary school (David Brink Laerskool Primary) and one (1) secondary school (Promosa Secondary School) each with 0.2% (n = 1).

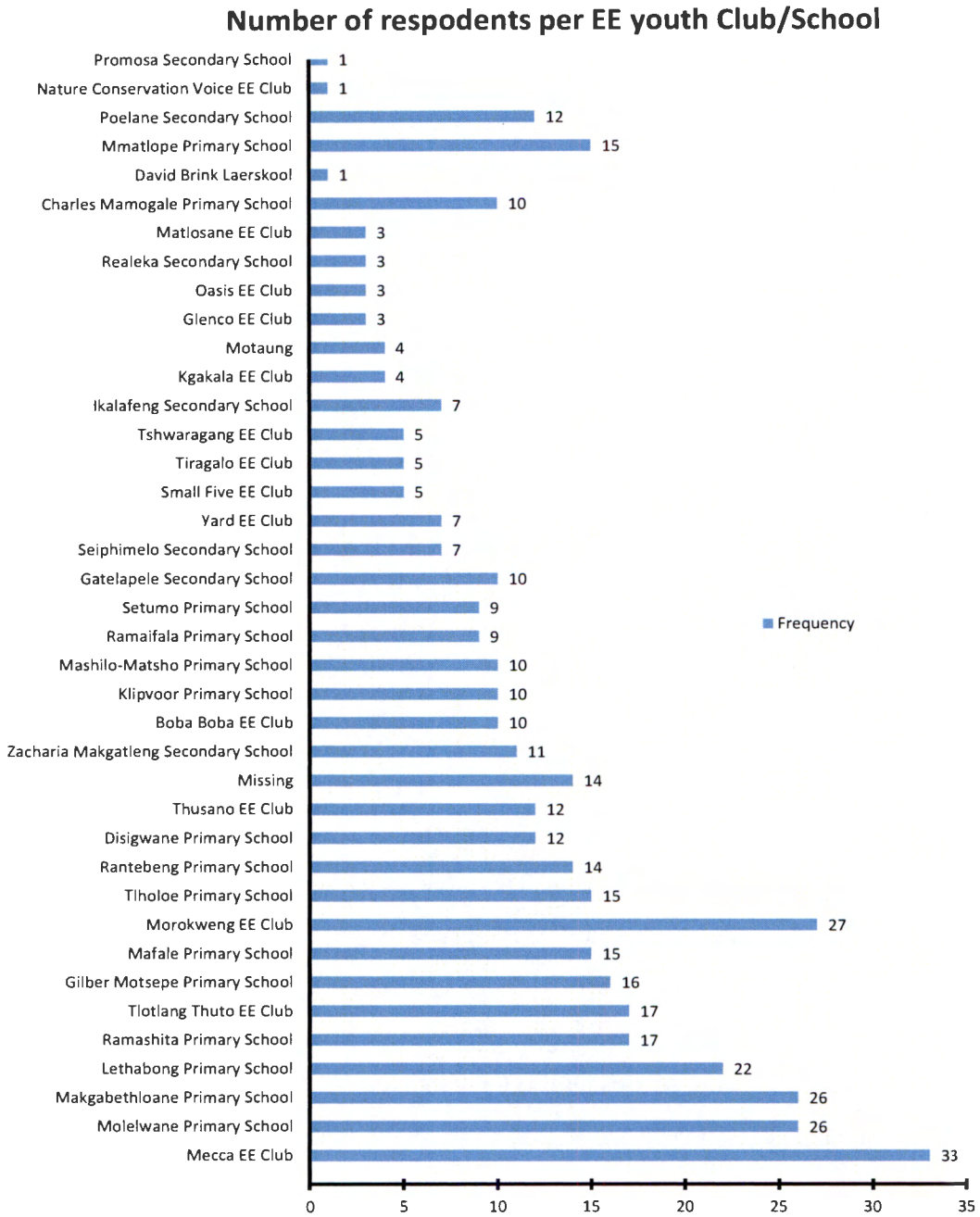

Figure 4.5. List of EE youth Clubs/schools from which responses were receive

4.2. ATTITUDE TOWARDS THE ENVIRONMENT SCALE

4.2.1. Introduction

This section focus on section B of the questionnaire that was distributed to EE youth club respondents which is answering secondary research question number one. The results were processed using Statistical Package for Social Science (SPSS) version 24. The independent t-test and One-way Analysis of Variance were used to test the significant difference in attitude toward the environment between respondents in terms of gender, age and residential district municipality.

4.2.2. Attitude Towards the Environment Scale (CATES)

This section will cover data analyses focusing on evaluating the level of attitude towards the environment of respondents who took part in the study as a measure of the impact of the EE youth programme implemented by READ within North West Province. It will do so by comparing the attitude of EE youth club respondents with the post EE exposure studies.

4.2.3. Validity of CATES

The degree to which CATES is able to measure attitude towards the environment for environmental education programme was determined using scree analysis (Figure 4.6) indicates the validity of four-factor solutions for the dataset counting for 52.83%. Component 1 explains16.04%, of the variation, component 2 explains 14.10%, component 3 explains 11.4% and component 4 explains 11.26%.

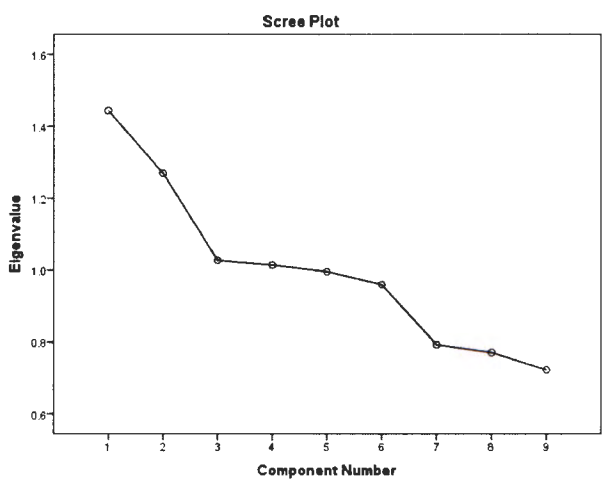

Figure 4.6. Scree plot for all 9 items on respondents` attitude towards the environment

4.2.4. Reliability of CATES

The degree to which results on environment attitude of youth participating in an environmental education programme can be reliably repeated using the CATES was determined by calculating the internal reliability using Cronbach`s alpha. The reliability of the CATES was determined by calculating a Cronbach`s Alpha Coefficient and found to be $\alpha = 0.173$ which is lower than expected. However, this was compensated by the Cronbach`s Alpha based on a standardized item of $\alpha = 0.212$ which was within the acceptable level of 0.5 and therefore accepted to be reliable and suitable for this study as indicated by Table 4.1 and Appendix 4.1. This is also affirmed by the Cronbach`s alpha for each item, which will be below $\alpha = 0.173$ in most of the items when any question is removed as indicated by Appendix 4.1.

Table 4.1 The CATES Cronbach's analysis

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.173	0.212	9

4.2.5. Respondents Attitude Towards the Environment

The data analysis was done by means of nine Likert-type scale items with four scored responses which vary from Strongly agree = 4, Agree = 3, Neutral/disagree = 2, and Strongly disagree = 1.

i. I am in favour of saving wilderness areas, even if few people ever get a chance to go there. The respondents that strongly agree to be in favour of saving the wilderness were 190 (44.1%) and 178 (41.3%) agreed, whereas only 15 (3.5%) strongly disagreed and 40 (9.3%) were neutral/disagreed. This reflects a positive attitude towards the environment by respondents.

ii. Poisonous snakes that pose a threat to people should be killed. Of 424 respondents, 115 (26.7%) strongly agreed and 100 (23.2%) agreed, whereas 123 (28.5%) strongly disagreed and 86 (20.0%) were neutral/disagreed to killing the poisonous snakes. The results show a positive attitude towards the environment from respondents.

iii. If a plant or animal is of no use to humans, then we don't need to waste our time and money trying to protect it. The analysis indicates the high number of respondents having a negative attitude towards the environment. Of 416 responses, 194 (45.0%) strongly agreed and 141 (32.7%) agreed, whereas only 22 (5.1%) and 59 (13.7%) strongly disagreed and were neutral/disagreed respectively to not wasting time and money by protecting plants or animals which are of no use to humans. The results show a negative attitude towards the environment from respondents.

iv. If I had to choose between protecting a natural area and creating homes for humans, I would choose to protect the area. Most of the respondents indicated to be strongly in agreement 194 (45.0%) and agreed 141 (32.7%), whereas 22 (5.1%) strongly disagreed and 59 (13.7%) and were neutral/disagreed. This is an indication of a high positive attitude towards the environment by respondents who will choose to protect natural areas over creating residential areas.

v. Government should pass laws to make recycling mandatory so that everyone is forced to recycle. Of 412 respondents, 179 (41.5%) strongly agreed and 112 (26.0%) agreed, whereas 64 (14.8%) strongly disagreed and 67 (15.5%) were neutral/disagreed. This indicates that most of the respondents have a positive attitude towards the environment and are in support of government punishing polluters.

vi. Preserving wild areas is not important because we are good at managing wildlife. According to the analysis 54 (13.2%) of respondents strongly agreed and 137 (31.8%) agreed, whereas 106 (24.6%) strongly disagree and 122 (28.3%) were neutral/disagreed. Which shows a positive attitude towards the environment as most of the respondents agree that it is important to preserve wilderness areas for both current and future generation.

vii. Industries should have to pay for any pollution they cause. Of 417 respondents, the majority strongly agreed 207 (48.0%) and 103 (23.9%) agreed to industries having to pay for the pollution they cause, whereas only 53 (12.3%) strongly disagreed and 54 (12.5%) were neutral/disagreed. The respondents have a positive attitude toward the environment since most of them support the polluters must pay principle.

viii. There is no point in getting involved in environmental issues since governments and industries have all the power and can do whatever they want to. Out of 422

respondents, 121 (28.1%) indicated strongly agree and 87 (20.2%) agree, whereas 129 (29.9%) strongly disagreed and 85 (19.7%) were neutral/disagreed. The respondents have a positive attitude towards the environment as most of them believe that the matters related to environmental are not for government and industries only.

ix. I am interested in spending time working to help the environment, even though I realize this will cut into my free time. Most of the respondents indicated they were strongly in agreement 239 (55.5%) and agreed 108 (25.1%), whereas 29 (6.7%) strongly disagreed and 46 (10.7%) were neutral/disagreed. Most of the respondents are committed to be involved in environmental related matters which indicates a positive attitude towards the environment. The results show a positive attitude towards the environment from respondents.

Figure 4.7 illustrates the overall attitude towards the environment of the respondents. It can be generalised that that at least 39.0% of responses strongly agreed and 22% agreed, making it 61% (n = 265). Whereas 20.2% strongly disagreed, and 15.7% neutral/disagreed which makes it 35.9% (n = 155) of the entire respondents.

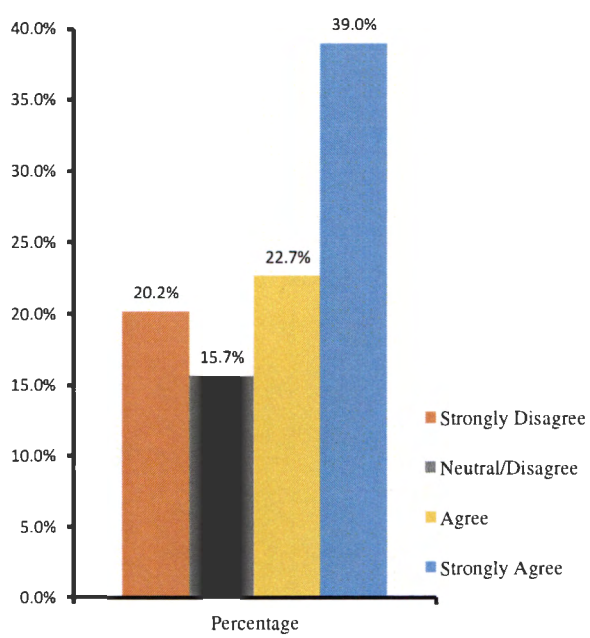

Figure 4.7. Indicating the respondent's overall attitude towards the environment

4.2.6. Independent Sample T-Test Statistics

According to Allan (1982:149); Weiss (2012:390) independent T-test is a statistical analysis used to determine whether or not there is a statistically significant difference evidenced between the means of two samples subjected under similar treatment conditions. As stated by Sheldon (2005:418) it is often called a between-groups design underpinned by the following assumptions.

- the assumption of independence. The data are independent of each other (the scores between two respondents are not related to each other)
- the assumption of normality. The test variable is normally distributed within each of the two populations. (the dependent variable groupings are normally distributed)
- the assumption of homogeneity of variance. The assumption requires that the sample variance of the test variables from the two populations are equal.

Of interest for the current study is the independent sample t-test, which provides a comparative analysis of means score of two different groups. In the context of this study, the independent t-test will provide a comparative analysis of the difference in attitude of respondents towards the environment as a result of gender, which is important. Such differences can be due to various factors, which the implementers of the EE youth programme will need to overcome in order to level the playing field and influence the positive attitude of participants equally. Hence it was necessary for this study to investigate if it exists. independent samples t-test analysis was determined to compare male and female attitude responses as a measure of the impact of the EE youth club programme implemented by READ.

There was no significant difference in responses provided by the majority of respondents for 100% (n = 8) questions out of 9. More specifically, there was no significant difference in attitude towards the environment between males and females for items questions as listed under Appendix 4.2. However, a significant difference at $t(410) = 3.226$, $p = 0.04$, two-tailed with males (Mean = 3.15, Std. Deviation = 1.01), showing much higher positive responses in support of government passing the legislation making recycling mandatory compared to

females (Mean = 2.81, Std. Deviation = 1.13). The magnitude of the differences in the means (Mean difference = 0.34, at 95% Confidence interval: 0.33 to 0.55) is small.

According to the Shapiro-Wilk test, $p < 0.001$ was obtained indicating data to be normally distributed, which was further supported by Kurtosis of -0.418 and -1.190 for males and females respectively. It can, therefore, be generally concluded that in terms of overall responses there is no significant difference in attitude between genders towards the environment.

4.2.7. One-way Analysis of Variance (ANOVA)

According to Glen (2017); Keller and Warrack (2004:472); Murray and Larry (2014:403); Sheldon (2005:495); Weiss (2012:527) to one-way analysis of variance (ANOVA) is used to determine if there is significant difference evidenced between two or more independent groups. As stated by Weiss (2012:527) it is often called a one-factor ANOVA or between-subjects ANOVA and the data set needs to meet the following requirements for One-way ANOVA.

- simple random samples
- independent samples
- normal distribution of the dependent variable for each group
- equal standard deviation

Of interest for the current study is one-way ANOVA, which provide a comparative analysis of means score of two or more different groups. In the context of this study, one-way ANOVA will provide a comparative analysis of the difference in attitude of respondents towards the environment as a result of age group and residential district municipality, which is important. The analysis of the difference in attitude of respondents towards the environment as a result of age is important. Since the EE programme is targeting different ages it is important to be able to package relevant information, which the implementers of the EE youth programme will need to be fully aware in order to be relent and appealing to respondents. Hence, it was necessary for this study to investigate as a baseline data if it exists. A one-way ANOVA was done to find out if there is a difference between six age groups in attitude towards the environment.

4.2.7.1. Age group analysis

A one-way ANOVA was conducted to determine if attitude towards the environment was different in different age groups. Furthermore, a post hoc test was done to find out where the difference between group exists. The one-way ANOVA indicated no statistically significant difference in attitude towards the environment between age groups for almost 77.8% (n = 7) out of 9 questions. The responses on which no significant difference was observed are as indicated under Appendix 4.3.

However, statistically significant differences in attitude towards the environment were recorded from respondents between district municipalities. Such differences were only recorded in a few 22.2% (n = 2) questions out of 9 as listed and Appendix 4.3.

i. 'Poisonous snakes that pose a threat to people should be killed'. Respondents were classified into six groups according to age: 8 - 12 (n = 205), 13 – 17 (n = 130), 18 – 22 (n = 40), 23 – 27 (n = 10), 28 – 32 (n = 6), and 33+ (n = 6). There was a statistically significant difference between groups as determined by one-way ANOVA (F = 0.912, df = 5.391 and, p = 0.001). However a Tukey post-hoc test revealed a non-statistically significant different in mean attitude toward environment between age groups 8 – 12 (Mean = 2.71), 13 – 17 (mean = 2.38), 28 – 32 (Mean = 2.00), 18 – 22 (Mean = 1.98) and 33+ (Mean = 1.50) age group (p = 0.084).

ii. 'There is no point in getting involved in environmental issues since governments and industries have all the power and can do whatever they want'. Respondents were classified into six groups according to age: 8 - 12 (n = 204), 13 – 17 (n = 129), 18 – 22 (n = 40), 23 – 27 (n = 10), 28 – 32 (n = 6), and 33+ (n = 6). There was a statistically significant difference between groups as determined by one-way ANOVA (F = 4.772, df = 5.389 and, p = 0.001). A Tukey post-hoc test indicated that the statistical difference was not significant, however, the younger age groups ,8 - 12 and 13 -17, had a much higher positive attitude towards the environment compared to above 18 – 22 age group (p = 0.34).

4.2.7.2. District municipality analysis

As EE youth club has been implemented in all four districts within North West Province, it is, therefore, important to find out if there is any difference in attitude towards the environment between respondents. The one-way ANOVA on attitude towards the environment was determined for respondents in all four districts.

A non-statistical significant difference in attitude towards the environment was recorded from respondents between district municipalities for a few (n = 4) questions out of 9 for the item questions as provided in Appendix 4.4, whereas statistical significant differences in attitude towards the environment were recorded from a slightly higher number of respondents between different district municipalities. Such differences were only recorded in a few (n = 5) questions out of 9 as listed and provided under Appendix 4.4:

i. 'I am in favour of saving wilderness areas, even if few people ever get a chance to go there'. Respondents were classified into four district municipalities: Bojanala Platinum District Municipality (n = 259), Dr Kenneth Kaunda District Municipality (n = 77), Dr Ruth Segomotsi Mompati District Municipality (n = 54), and Ngaka Modiri Molema District Municipality (n = 33). There were statistically significant differences in mean attitude towards the environment among respondents from different district municipalities F = 4.772, df = 3.419 and p = 0.003. Post-hoc comparisons using the Tukey HSD test indicated that the mean attitude towards the environment of respondents residing at Dr Kenneth Kaunda District Municipality (Mean = 3.17, St. deviation = 0.951), Bojanala Platinum District Municipality (Mean =3.23, St. Deviation = 0.746) and Dr Ruth Segomotsi Mompati District municipality (Mean = 3.50, St. Deviation = 0.720), were significantly lower compared to respondents from Ngaka Modiri Molema District Municipality(Mean = 3.64, St. Deviation = 0.489). However, there is no difference in mean attitude towards the environment between respondents from Dr Ruth Segomotsi Mompati District municipality and Ngaka Modiri Molema District Municipality.

ii. Poisonous snakes that pose a threat to people should be killed'. Respondents were classified into four district municipalities: Bojanala Platinum District Municipality (n = 260), Dr Kenneth Kaunda District Municipality (n = 77), Dr Ruth Segomotsi Mompati District Municipality (n = 54), and Ngaka Modiri Molema District Municipality (n = 33). There was a statistically significant difference between groups

as results of difference between district municipality indicated by one-way ANOVA F = 6.095, df = 3.420 and p = 0.001. Post-hoc comparisons using the Tukey HSD test indicated that the mean attitude towards the environment of respondents residing in Dr Kenneth Kaunda District Municipality (Mean = 1.99, St. Deviation = 0.993) and Ngaka Modiri Molema District Municipality (Mean = 2.52, St. Deviation = 1.253) were significantly lower compared to respondents from Bojanala Platinum District Municipality (Mean =2.59, St. Deviation = 1.180) and Dr Ruth Segomotsi Mompati District municipality (Mean = 2.69, St. Deviation = 1.163). However, there was no difference in mean attitude toward the environment of respondents from Ngaka Modiri Molema District Municipality, Bojanala Platinum District Municipality and Dr Ruth Segomotsi Mompati District municipality.

iii. 'Government should pass laws to make recycling mandatory so that everyone is forced to recycle there'. Respondents were classified into four district municipalities: Bojanala Platinum District Municipality (n = 259), Dr Kenneth Kaunda District Municipality (n = 77), Dr Ruth Segomotsi Mompati District Municipality (n = 54), and Ngaka Modiri Molema District Municipality (n = 32). There were statistically significant differences in mean attitude towards the environment among respondents from different district municipalities F = 3.933, df = 3.418 and p = 0.009. Post-hoc comparisons using the Tukey HSD test indicated that the mean attitude towards the environment of respondents residing in Dr Kenneth Kaunda District Municipality (Mean = 3.17, St. Deviation = 0.951), Bojanala Platinum District Municipality (Mean =3.23, St. Deviation = 0.746) and Dr Ruth Segomotsi Mompati District municipality (Mean = 3.50, St. deviation = 0.720), were significantly lower compared with respondents from Ngaka Modiri Molema District Municipality(Mean = 3.64, St. Deviation = 0.489). There was no statistically significant difference in mean attitude towards the environment between respondents from Dr Ruth Segomotsi Mompati District Municipality and Ngaka Modiri Molema District Municipality.

iv. 'Industries should have to pay for any pollution they cause'. Respondents were classified into four district municipalities: Bojanala Platinum District Municipality (n = 254), Dr Kenneth Kaunda District Municipality (n = 76), Dr Ruth Segomotsi Mompati District Municipality (n = 54), and Ngaka Modiri Molema District Municipality (n = 33). There was a statistically significant difference between groups

as a result of the difference between district municipality indicated by one-way ANOVA F = 5.573, df = 3.413 and p = 0.001. Post-hoc comparisons using the Tukey HSD test indicated that the mean attitude towards the environment of respondents residing in Bojanala Platinum District Municipality (Mean = 2.96, St. Deviation = 1.068) was significantly lower compared to respondents from Ngaka Modiri Molema District Municipality(Mean = 3.06, St. Deviation = 1.273), Dr Ruth Segomotsi Mompati District Municipality (Mean = 3.33, St. Deviation = 1.028) and Dr Kenneth Kaunda District Municipality (Mean = 3.47, St. Deviation = 0.840). There was no difference in mean attitude towards the environment between respondents from Dr Ruth Segomotsi Mompati District Municipality, Dr Kenneth Kaunda District Municipality and Ngaka Modiri Molema District Municipality.

v. 'There is no point in getting involved in environmental issues since governments and industries have all the power and can do whatever they want'. Respondents were classified into four district municipalities: Bojanala Platinum District Municipality (n = 259), Dr Kenneth Kaunda District Municipality (n = 78), Dr Ruth Segomotsi Mompati District Municipality (n = 54), and Ngaka Modiri Molema District Municipality (n = 31). There was a statistically significant difference between groups as results of differences between district municipality indicated by one-way ANOVA (F = 4.970, df = 3.418 and, p = .002). A Tukey post-hoc test revealed statistically significantly higher positive mean attitude towards the environment from respondents residing in Ngaka Modiri Molema District Municipality(Mean = 1.81, St. Deviation = 0.910) and Dr Kenneth Kaunda District Municipality (Mean = 2.29, St. Deviation = 1.229) was significantly different from mean attitude towards the environment respondents from Dr Ruth Segomotsi Mompati District Municipality (Mean = 2.48, St. Deviation = 1.193) and Bojanala Platinum District Municipality (Mean = 2.61, St. Deviation = 1.194). There was no statistically significant difference in mean attitude towards the environment between respondents from Dr Ruth Segomotsi Mompati District Municipality, Dr Kenneth Kaunda and Bojanala Platinum District Municipality.

vi. 'I am interested in spending time working to help the enviroment even though I realise this will cut into my free time'. Respondents were classified into four district municipalities: Bojanala Platinum District Municipality (n = 258), Dr Kenneth

Kaunda District Municipality (n = 77), Dr Ruth Segomotsi Mompati District Municipality (n = 54), and Ngaka Modiri Molema District Municipality (n = 33). There was a statistically significant difference between groups as a result of difference between district municipality indicated by one-way ANOVA F = 2.818, df = 3.418 and p = 0.04. Post-hoc comparisons using the Tukey post-hoc test indicated the mean attitude towards the environment of respondents from all four district municipalities (Bojanala Platinum District Municipality (mean = 2.53, St. Deviation = 1.260), Ngaka Modiri Molema District Municipality (mean = 2.73, St. Deviation = 1.257) and Dr Kenneth Kaunda District Municipality (mean = 2.96, St. Deviation = 1.221)) to be similar.

4.3. CHILDHOOD CONCERNS RANK ORDER TASK

4.3.1. Introduction

This section will cover data analysis focusing on concerns from respondents who took part in the study as an indication of how orderly tasks are ranked by the beneficiaries of the EE youth programme implemented by READ within North West Province.

4.3.2. Validity of CCROT

The scree analysis (Figure 4.8) indicate the validity of three-factor solutions for the dataset counting for 61.12%. Component 1 explains 29.69% of the variation, component 2 explains 18.17%, and component 3 explains 13.25%.

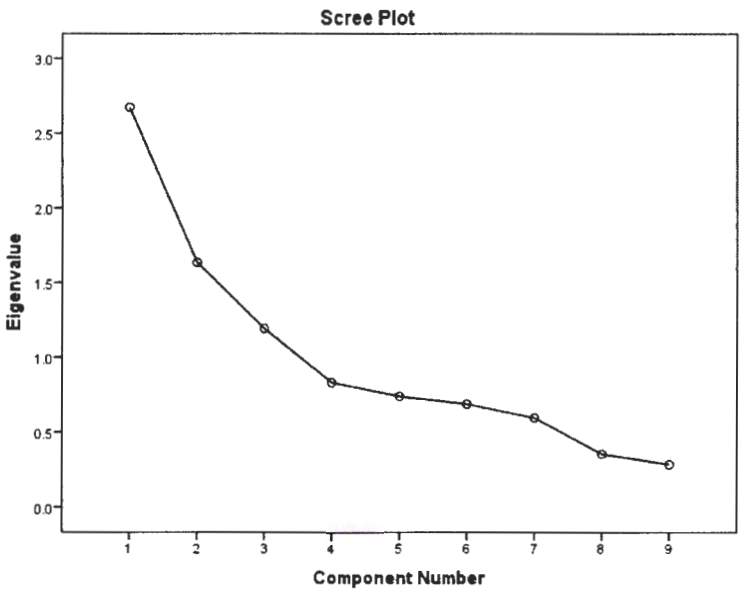

Figure 4.8. Scree plot for all 9 items on the Childhood Concerns Rank Order Task

4.3.3. Reliability of CCROT

The reliability of the CCROT was determined by calculating Cronbach`s Alpha Coefficient and was found to be $\alpha = 0.669$ which was greater than $\alpha = 0.5$ and was therefore considered to be reliable and suitable for this study, as indicated by Table 4.2. This is also affirmed by the Cronbach's alpha which will be below $\alpha = 0.669$ if most of the questions are removed (Appendix 4.5).

Table 4.2. The CCROT Cronbach`s analysis

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.669	0.689	9

4.3.4. Respondents Child Concerns Rank Order Task

The data analysis was done by means of five Likert-type items with ranting from 1-10. (1-2 = Highly unconcerned (scored 1), 3-4 = Unconcerned (scored 2), 5-6 = Neutral (scored 3), 7-8 = Concerned (scored 4), and 9-10 = Highly Concerned (scored 5).

i. Do you worry about water? According to the analysis, the majority of responses ranked water as a high concern with a mean = 4.74 and St Deviation 0.42) by 367 (85.2%, n = 413) of respondents.

ii. Do you worry about dying? All most half of the respondent ranked dying as just being a concern with a mean 3.79 and St. deviation 0.80 by 233 (54.1%, n = 408).

iii. Do you worry about death? Similar to dying, death was also ranked as being a concern with a mean of 3.65 and St. Deviation 0.80 by 208 (48.3%, n = 409).

iv. Do you worry about air pollution? Respondents, as indicated, ranked air pollution as a high concern with a mean of 4.37 and St. Deviation 0.58 by 282 (65.4%, n = 404.

v. Do you worry about environmental pollution? Similar to air pollution, environmental pollution was also ranked high with (4.38 ± 0.58) by 287 (66.6%, n = 403).

vi. Do you worry about drugs? Drugs (3.07 ± 0.92) by 178 (41.3%, n = 409) seems to be of less concern to respondents.

vii. Do you worry about doing well in school? Performance at school is ranked highly by respondents with a mean of 4.50 and St. Deviation 0.61 by 360 (76.6%, n = 400.

viii. Do you worry about what is happening to animals? Animal welfare was ranked to be a concern by respondents with a mean of 4.32 and St. Deviation 0.58 by 220 (62.6%, n = 404).

ix. Do you worry about car accident? Of surprise was an accident, which is a ranked as a concern by respondents with a mean of 4.13 and St Deviation 0.67 by 260 (60.3%, n = 410) but not as high as environmental related issues.

As indicated by Figure 4.8, all four questions that relate to the environment were generally ranked highly with the range of 62.6 - 85.2 % response percentages. At a high level of ranking was a concern by respondents to perform at school with 76.6%. Death was of average concern ranging between 48.3 – 54.1%. Of least concern was drugs with 41.3%.

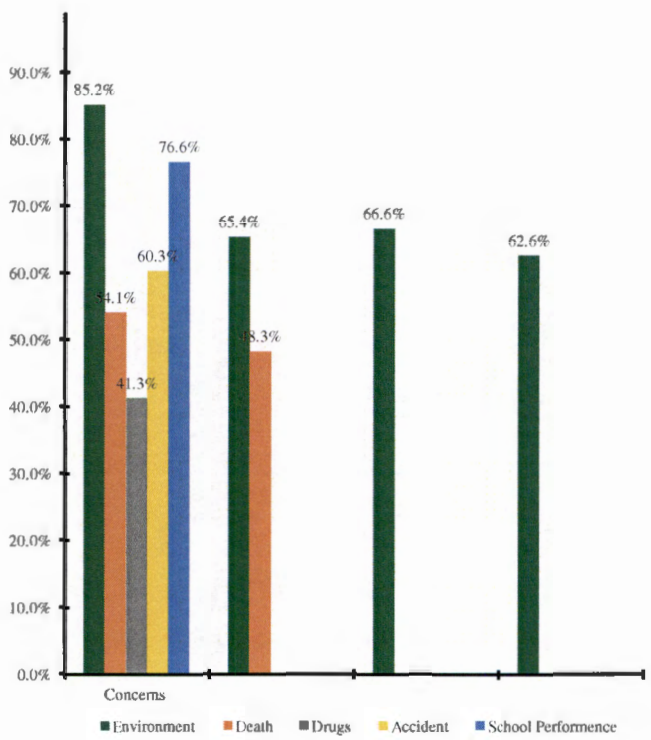

Figure 4.9. Represents overall concerns ranking order of respondents.

4.3.5. Independent Sample T-Test Statistics

Similar to bullet 5.6, in the context of the current study, independent t-test was also used to provide a comparative analysis of the difference in concerns ranking by respondents as a result of gender, which is important. Such differences can have a major implication in terms

of the criteria and recruitment strategy for beneficiaries. In so doing the implementers will be able to have gender representativity within the EE youth clubs.

No significant difference in task concerns ranking order was recorded between respondents as a result of gender. Of the responses received, 77.8% (n = 7) questions out 9 showed no significant differences in the task ranking order of concern by respondents by gender. More specifically, there were no significant differences in task ranking order of concerns between male and female respondents in the items questions as indicated in Appendix 4.6.

However the significant difference in the order in which task concern are ranked between males and females was only recorded for a few responses, 22.2 % (n = 2) questions out 9. More specifically, the significant differences in concern task order ranking were noticed from responses when answering items as stated and shown in Appendix 4.6.

i. Do you worry about dying? The significant difference between males and females responses in ranking concern, at $t(397) = -2.03$, $p < 0.05$, two-tailed, with females (Mean = 3.94, Std. Deviation = 1.53), showing much higher concern towards dying compared to males (Mean = 3.61, Std. Deviation = 1.71). The magnitude of the differences in the means was (Mean difference = -0.33, at 95% Confidence interval:-0.65 to -0.009) small (eta squared = 0.05).

ii. Do you worry about environmental pollution? Lastly a similarly significant difference between males and females in ranking environmental pollution, at $t(393) = -2.57$, $p < 0.001$, two-tailed with females (Mean = 4.53, Std. Deviation = 0.99), being a greater concern compared to males (Mean = 4.22, Std. Deviation = 1.32). The magnitude of the differences in the means (Mean difference = -0.31, at 95% Confidence interval:-0.54 to -0.07) was small (eta squared = 0.05).

According to Shapiro-Wilk test, $p < 0.001$ was obtained indicating data to be normally distributed, which was supported by Kurtosis of 0.028 and 0.274 for females and males respectively. It can, therefore, be generally concluded that in terms of overall responses there is no significant difference between gender in concerns task ranking order.

4.3.6. One-way Analysis of Variance (ANOVA)

Similar to bullet 5.7, of interest for the current study is one-way ANOVA, which provides a comparative analysis of means score of two or more different groups. In the context of this study, one-way ANOVA will provide a comparative analysis of the difference in the way concerns are ranked by respondents as a result of age and residential district municipality. The analysis of the difference in concerns task ranking order of respondents as a result of age is important in further probing precursors that lead to youth participating in EE youth club. It will, therefore, assist the EE programme implementers in making sure that realistic expectations are met by packaging relevant information.

4.3.6.1. Age group analysis

A one-way ANOVA was done to find out if there is a difference between six age groups in concerns task ranking order between respondents. The non-significant difference between age groups was recorded in the way concerns are rank in order for the most of the (n = 6) out of 9 item questions as listed in Appendix 4.7.

A significant difference in response between age groups was recorded in terms of concerns ranking order by 33.3% (n = 3) of respondents for the item questions as listed.

i. 'Do you worry about water?' Respondents were classified into six age groups: 8 - 12 (n = 205), 13 – 17 (n = 130), 18 – 22 (n = 39), 23 – 27 (n = 10), 28 – 32 (n = 6), and 33+ (n = 6). There was a statistically significant difference between groups as determined by one-way ANOVA *(*F = 4.424, df = 5.383 *and,* p = .001). A Tukey post-hoc test revealed statistically significantly higher concerns task ranking order being statistically significantly higher in the 18 - 22 age group compared to 8 – 12 age group (p = .001). Post-hoc comparisons using the Tukey HSD test indicated that the mean concern ranking order task of respondents residing in the 33+ age group (Mean = 3.67, St. Deviation 2.066) was significantly different from mean concern ranking order task in age group of 23 - 27 (Mean = 4.11, St. Deviation = 1.176), 18 - 22 (Mean = 4.54, St. Deviation = 1.120), 8 - 12 (Mean = 4.74, St. Deviation = 0.869), 13 - 17 (Mean = 4.89, St. Deviation = 0.383) and 28 - 32 (Mean = 5.00, St. Deviation = 0.001). There was no statistically significant difference in mean concerns ranking order task between respondents in the age groups 33+, 23 – 27 and 18 – 22.

ii. 'Do you worry about air pollution?' Respondents were classified into six age groups: 8 - 12 (n = 204), 13 – 17 (n = 122), 18 – 22 (n = 36), 23 – 27 (n = 9), 28 – 32 (n = 6),

and 33+ (n = 4). There were no statistically significant differences in mean concerns tasks ranking order among respondents as a results of age group difference F = 3.203, df = 5.375 and p = 0.008. Post-hoc comparisons using the Tukey HSD test indicated that the mean concerns order task of respondents from five age groups have no significant difference (p = 0.351).

iii. 'Do you worry about drugs?' Respondents were classified into six age groups: 8 - 12 (n = 205), 13 – 17 (n = 130), 18 – 22 (n = 39), 23 – 27 (n = 10), 28 – 32 (n = 6), and 33+ (n = 6). There was a statistically significant difference between groups as determined by one-way ANOVA (F = 4.889, df = 5.380 and, p = .001). Post-hoc comparisons using the Tukey HSD test indicated that the mean concerns order task of respondents from five age groups to have no significant difference (p = 0.087).

4.3.6.2. District municipality analysis

As the EE youth club has been implemented in all four districts within North West Province, it is, therefore, important to find out if there is any difference in concerns tasks ranking order between respondents as a result of residential area. The one-way ANOVA on concerns task ranking order was determined for respondents in all four districts.

Non-statistical significant differences in concerns task ranking order were determined for respondents between district municipalities in most of the question 77.8% (n = 7) out of 9 as shown and under Appendix 4.8.

However a significant difference was recorded among respondents for few 22.2% (n = 2) of questions out of 10 in concerns task ranking order between district municipalities.

i. 'Do you worry about dying?' Respondents were classified into four district municipalities: Bojanala Platinum District Municipality (n = 254), Dr Kenneth Kaunda District Municipality (n = 70), Dr Ruth Segomotsi Mompati District Municipality (n = 51), and Ngaka Modiri Molema District Municipality (n = 33). There were no statistically significant differences in mean concerns task ranking order among respondents from different district municipalities F = 0.200, df = 3.416 and p = 0.006. Post-hoc comparisons using the Tukey HSD test indicated that the mean concern ranking task order of respondents residing in Ngaka Modiri Molema District Municipality (Mean = 2.88, St. Deviation = 1.916) were significantly different from mean Concern task ranking order of respondents from Dr Ruth Segomotsi Mompati

District Municipality (Mean = 3.65, St. Deviation = 1.467), Bojanala Platinum District Municipality (Mean = 3.89, St. Deviation = 1.632) and Dr Kenneth Kaunda District Municipality (Mean = 3.96, St. Deviation = 1.408).

ii. Do you worry about death? Respondents were classified into four district municipalities: Bojanala Platinum District Municipality (n = *258),* Dr Kenneth Kaunda District Municipality (n = 67), Dr Ruth Segomotsi Mompati District municipality (n = 52), and Ngaka Modiri Molema District Municipality (n = 32). There were no statistically significant differences in mean concerns task ranking order among respondents from different district municipalities F = 0.200, df = 3.416 and p = 0.005. Post-hoc comparisons using the Tukey HSD test indicated that the mean concern ranking task order of respondents residing at Ngaka Modiri Molema District Municipality (mean = 2.69, St. deviation = 1.786) were significantly different from mean concern task ranking order of respondents from Dr Ruth Segomotsi Mompati District municipality (mean = 3.77, St. Deviation = 1.529), Bojanala Platinum District Municipality (mean = 3.76, St. Deviation = 0.098) and Dr Kenneth Kaunda District Municipality (mean = 3.60, St. deviation = 1.670).

4.4. ANNUAL REPORTS ANALYSIS

4.4.1. Introduction

The second set of questionnaire were distributed electronically to the officials responsible for the implementation of EE youth club in the provincial Department of Rural Development, Environment and Agricultural Development. The desktop analysis of 2010 to 2015 Annual Reports was done. The results are processed using Statistical Package for Social Science (SPSS) version 24.

4.4.2. Management of EE Youth Club Programme

As stated under bulletin 4, the second set of questionnaire was distributed electronically to the officials responsible for the implementation of EE youth club within the province. A total of 3 respondents were used in the analysis with experience ranging from 10 to 21 years.

4.4.2.1. EE youth club activities

According to the analysis, Bojanala Platinum district has more activities (n = 7) that are done compared to Dr Kenneth Kaunda District (n = 5). Bojanala District Platinum District Municipality uses word of mouth, social media and club visits for marketing EE youth club, whereas Dr Kenneth Kaunda District Municipality relied on word of mouth, referrals, camps, environmental calendar events, workshops and distribution of flyers. The delivery mechanism for EE youth club used by Bojanala Club is club site.

4.4.2.2. EE youth club outputs

There are currently 22 EE youth clubs that have been established in Bojanala Platinum District Municipality consisting of 340 members, whereas Dr Kenneth Kaunda District Municipality has 23 EE youth clubs with 636 members in the district.

4.4.2.3. EE youth club inputs

In terms of human resource requirements, respondents indicated that each region must at least have four officials and a budget of at least R2 000 000.00. As per respondents, the budget is to be used for the procurement of club identification kit, certificates, membership cards, club marketing material, club branding material, bandannas, and tents.;

4.4.2.4. EE youth club outcomes

The following are major outcomes planned for EE youth clubs in Bojanala Platinum District (responsible youth who understand how to deal with environmental issue, who can be ambassadors of the environment, and who can develop a career out of environment and conservation), whereas Dr Kenneth Kaunda District Municipality is focusing on achieving the following planned outcomes (registering of cooperatives, opening of green business, right career path, and cleaner schools and towns). The following are listed by respondents from Dr Kenneth Kaunda District Municipality to be strategic objectives of EE youth clubs support strategy, to assist club members individually and collectively, to recognize and evaluate values that inform attitude and actions towards the environment, to strengthen environmental awareness creation, to celebrate environmental calendar days and to have a better exit strategy for environmental clubs.

4.4.2.5. EE youth club impacts

The following are said to be impacts that are caused by EE youth club, per respondents from Bojanala Platinum District Municipalities contribute in addressing issues that impact negatively on the environment and youth are able to lead and advise their local village, whereas Dr Kenneth Kaunda respondents indicated that it creates awareness, transfers and shares environmental knowledge, changes peoples' attitudes towards the environment, environmental recruitment, celebration of calendar of events, cleaning campaigns, raising funds for their self-organized camps and recycling.

4.4.3. Annual Report Analysis

The desktop analysis was only done on annual reports from 2010 until 2015, which are the only ones in the public domain due to time limitation. The results are processed and analysed using comparative analysis.

According to the analysis provided in Table 4.3, the targeted vs an actual number of EE youth club established per year as from 2010 is as indicated by the Table 4.3, with a total of 74 by 2013. The number of newly recruited environmental club members is 2 879 as of 2013. As from 2013, there has been a change in indicators. Each district hosted three EE youth club camps per annum at a cost of at least R60 000 per camp and one provincial EE youth club camp per annum is held at a cost of at least R500 000.00.

Table 4.3 Data analysis on annual indicators targets and actual achievements from READ annual report during 2010 to 2016(sources READ 2010-2014 annual report)

Financial Year	Target Number of environmental education clubs established	Actual Number of environmental education clubs established	Target Number of newly recruited environmental clubs members	Actual Number of newly recruited environmental clubs members	Total Regional Camp Expenditure	Total Provincial Camp Expenditure
2010	10	14	300	782	R 720 000.00	R 500 000.00
2011	10	15	400	800	R 720 000.00	R 500 000.00
2012	10	24	450	476	R 720 000.00	R 500 000.00
2013	13	21	400	821	R 720 000.00	R 500 000.00
2014					R 720 000.00	R 500 000.00
2015					R 720 000.00	R 500 000.00
2016					R 720 000.00	R 500 000.00

4.5. Summary

The majority of respondents are of the age group between 8 to 12, which can be attributed to the sampling timing, since it was done during the EE youth club regional camps, which mostly targeted high primary school pupils. It is interesting that most of the respondents were females compared to males, which is a true reflection of how prevalent gender is skewed towards more females tendency that has also been recorded at school level. The high number of respondents from Bojanala Platinum District compared to others residential district municipalities is by no means an indication of how beneficiaries of the EE youth clubs implemented by READ is distributed. The difference is due to logistic arrangements related to transportation of participants to the two EE youth club camps, which were held within Bojanala Platinum district.

The majority of respondents have a positive attitude towards the environment indicated by a strong agreement in support of most of the environmental statements 7 out of 9. In terms of overall responses, it can generally be concluded that there was no significant difference in mean attitude towards the environment in terms of gender between respondents according to independent T-test. A slight significant difference in only 2 statements out of 9 was observed between respondents following One-way ANOVA between age groups in terms of attitude towards the environment. The younger age group (8 – 17 years old) had a much higher positive attitude to the environment compared to older age groups (above 18). Statistically significant differences was found to exist in mean attitude towards the environment due to residential district municipalities between respondents. The overall attitude (2.85 ± 0.36) towards the

environment in response is lower compared to the post-exposure which confirms a slightly low attitude by respondents.

Similarly, to CATES in terms of overall responses, it can generally be concluded that there was no significant difference in mean concern ranking task in terms of gender as shown using independent T-test and age groups between respondents according to One-way ANOVA. There was also no significant difference in mean concerns task ranking order between respondents as a results of residential district municipalities. According to the responses, the environment is ranked high by the majority of respondents with a mean and St. Deviation of 4.45 ± 1.08. It is also followed by a concern to performance at school with the mean and St. Deviation of 4.50 ± 1.22.

In terms of the management of EE youth club programme, the responses received were only coming from two district municipalities which are Bojanala Platinum and Dr Kenneth Kaunda. The non-response from other two other district municipality was as a result of retirement of officials responsible for the implementation of the EE youth club programme. It can generally be concluded that EE youth clubs are managed and implemented differently at the district level in terms of activities, outputs, inputs, outcomes and impacts. It might be an indication of insufficient strategic alignment and implementation between different district municipalities.

In terms of overall desktop analysis according to READ annual performance plan and annual reports all EE related targets were achieved. Overachievement in some of the indicators can be attributed to poor benchmarking or under-targeting. There was a change in indicators which made it difficult to make comparison throughout the study period. The next chapter provides discussion of the results and concludes with recommendations.

CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

This chapter outlines a brief summary of the study. Furthermore, it presents major findings and discusses them in light of the literature review. Based on the discussions, recommendations and conclusions are made. The recommendations are made with the aim of outlining possible policy improvement areas for the effective and efficient implementation of EE youth club programme.

5.2. Study Background

READ has been implementing EE youth club programme over the past ± 10 years. As part of monitoring and evaluation, a need was identified to systematically evaluate the programme. As stated by Carleton-Hug and Hug (2010:121) it is a major organisational concern when evaluating the performance of the entire programme, to confidently confirm if the endeavour is yielding expected results. Hence, the current research study primary search problem is to investigate the impact of EE youth club programme as a performance measure of achieving selected departmental strategic objectives within the province.

The secondary research questions were as follows:

i. Does the EE youth clubs programme implemented by READ change the attitude of youth towards the environment in comparison with post-exposure results of other studies?
ii. What are the major concerns task ranking order for youth to participate in EE youth club programme?
iii. Are annual targets being met in terms of the number of EE youth clubs established and membership thereof from 2011 – 2016?

5.3. Strength and Limitations

The importance of this study is that it is the first to evaluate EE youth club implemented by READ within North West Province. It has thus contributed to the existing literature and forms a possible benchmark and opens the door for future research. This study has also tested the possibility of using CATES and CCROT. There are, however, several limitations of this study

that are worth considering. The respondents from four district municipalities were not consistent in their EE youth club membership. This has resulted in over-representation of respondents from Bojanala Platinum District. The implementing officers from READ were only from Dr Kenneth Kaunda and Bojanala Platinum District. So findings on the attitude towards the environment and concerns ranking orders inference cannot be generalised within the province. The future research should include sampling of participants` pre-exposure to EE youth club activities.

5.4. Environmental Attitude Towards the Environment

As per study by Erhabor and Don (2016), the overall mean attitude of EE youth club respondents (Mean score = 49.93, St. Deviation = 6.98, higher than statistical mean = 28.5) toward the environment shows similar trends to what has been obtained in other studies (Mean score = 38.64, St. Deviation = 4.29, higher than statistical mean =0 24), which indicates that EE youth club respondents have a positive attitude towards the environment. However, Likert scale mean value of EE youth club respondents attitude towards the environment (Mean = 2.85, and St. Deviation = 0.36) was found to be slightly low compared to post-project survey (Mean = 4.04, 3.50 and 4.02) finding of a pre-project and post-project analysis done by Ernst *et al.* (2017:160); Grúňová *et al.* (2017:8); Sousa *et al.* (2016:6) respectively.

5.4.1. Gender

Similar to the study by Grúňová *et al.* (2017:8); Pothitou *et al.* (2017:408); Shay-Margalit and Rubin (2017:122), the current study did not find statistically significant difference in mean score attitude towards the environment as a result of gender. The current findings are contrary to a study by Bergman (2016:486); Jackson *et al.* (2016:77); Newman and Fernandes (2016:172) who found a significant difference due to gender. Nevertheless the fact that there seems to be a slight difference in attitude towards the environment by gender should be a concern to the implementers of the programme in order to eliminate possible barriers.

5.4.2. Age Groups

Similar to the study by Grúňová *et al.* (2017:8); Prati *et al.* (2017:188) and contrary to findings by Jackson *et al.* (2016:77) the current study could not find any meaningful significant difference in attitude towards the environment from EE youth club respondents due to age. The slight

significance difference recorded was noted in the 33+ age group with a lower mean score and a statistically significant difference on two items measuring attitude towards the environment, which is contrary to previous findings of 16 - 19 of age, which was suggested to be due to the educational experience of the secondary students in Hong Kong. The younger age was also found to have a much higher mean score attitude towards the environment in most of the items which are in support of the findings by Bergman (2016:486); Grúňová *et al.* (2017:14); Malkus and Musser (1997:12).

5.4.3. Residential District Municipality

Similar to the study by Verma (2016:185), the current study finds a statistically significant difference between respondents due to residential district municipality. The importance of considering prevailing local conditions was also supported with a model from the study which was conducted by Davino *et al.* (2017:14), which found a strong positive relationship between local awareness and motivation for individuals to act in favour of the environment.

5.4.4. Recommendations

It is recommended that EE youth club support is properly designed in order to have a strong impact on participants` attitudes and motivate them to make desired attitude and behavioural changes as stated by Erzengin and Teke (2013); Johnson and Činčera (2016).

It is recommended that the EE youth club support initiative takes into consideration the economic and social circumstances of targeted groups, more especially residential district municipality such that activities are tailored to meet expectations and needs of beneficiaries, similar to what was proposed by Cruz and Tantengco (2017); Kiessling *et al.* (2017); Verma (2016). The study by Ardoin *et al.* (2015) also suggests that an attempt to consider broader social contexts is also essential in designing programme that will encourage a shift in attitude and behaviour. Based on the literature review the EE youth club programme will be more beneficial if objectives can be directly related to providing practical environment where beneficiaries reside e.g. water-related issues, rhino poaching, illegal trade of wildlife, sustainable utilization of natural resources and impacts of mining.

5.5. Concerns Task Ranking Order

The Childhood concerns ranking order "measures children`s concern about environmental problems relative to other common children worries" as stated by Malkus and Musser (1997:5). Similar to the study by Malkus and Musser (1997:11) the current study found environmental concerns were within a similar mean score of about 4.99. Overall, the respondents ranked environmental concerns high. On the same scale, they also ranked performance at school. Of serious consideration is the concern about death and drugs among respondents.

5.5.1. Gender

The current study could not find any difference in the manner in which respondents ranked order of their concerns in terms of gender, which is different from the study by Bergman (2016:486); Newman and Fernandes (2016:172), who find females to be more pro-environmental oriented compared to males.

5.5.2. Age Group

Similar to gender, the current study could not find any difference in ranking order of concern by age, as compared to findings of a stronger environmental orientation of younger students in the studies by Malkus and Musser (1997:12); Newman and Fernandes (2016:165).

5.5.3. Residential District Municipality

There was also no difference observed between respondents in terms of residential district. The difference observed in other studies were on religious beliefs and race, which counted for 8 to 19% according to Newman and Fernandes (2016:169).

5.5.4. Recommendations

It is recommended that the implementer consider respondents` concern about their performance at school. Such concern can be resolved through activities such as career guidance and motivational speakers during youth camps. What could work best is EE topics which are directly linked to school syllabus (e.g. rhino poaching, carrying capacity, water cycle) in order to reinforce practical knowledge and complement school performance. Even though the current study could not find any significant difference in respondents in terms of concern ranking task orders in terms of gender, age and residential district, it is still important to consider, more so that South Africa promotes equal opportunities for all. It is recommended that more efforts be

made to recruit other races and people with disability to participate in EE youth club initiative programme.

5.6. Management of EE Programnme

Similar to the study by Ozdemir (2016:161), the various EE youth club respondents are exposed to various environmental activities which can be attributed to enhancing their appreciation and understanding of ecological and natural resources.

As suggested by Cruz and Tantengco (2017:45); Mohamed (2016:1) the challenges of attaining environmental education pre-planned goals call for a special attention to selecting effective educational strategies. This was also supported by recommendations from the study by Erhabor and Don (2016:5362) who recommend that there is a lot which needs to be done in stimulating and boosting EE to ensure effective and efficient implementation.

5.6.1. Recommendation

It is also recommended that efforts be made in order to involve other stakeholders to create a sense of stewardship towards the environment, as suggested by Verma (2016:183)

It is recommended that consideration is given to various activities which beneficiaries are to be exposed to, such that they contain different environmental problems as this has been found to enhance understanding of the environmental concept in a study such as Case study in Erbil by Ozdemir (2016:161).

It is recommended that strategically planned and implemented pre and follow-up activities targeting participants as a way to reinforce and establish longer-term changes in behaviour by beneficiaries similar to a study by Johnson and Činčera (2016:106); Kney *et al.* (2016:26); Richards *et al.* (2017:123); Thomson and Hoffman (2010:68).

It is recommended that EE youth club support is properly designed in order to have a strong impact on participants` attitudes and motivate them to make desired behavioural changes (Thomson & Hoffman, 2010:11).

It is recommended that scientifically sound measuring tools be put in place as stated by Ham *et al.* (2016:159); Heimlich (2010:184) "only things that can be measured can actually be managed"

5.7. Analysis of Annual Reports

According to desktop analysis, there are several indicators which relate to EE. Over the past five years, EE indicators have been rephrased; some require different forms of measurement. On a positive note is that for most of the indicators there has been an overall overachievement of over 200%.

5.7.1. Recommendation

It is recommended that a proper expenditure for implementing EE youth club be maintained with clear distinction of the district and provincial expenditures. It is recommended that standardization of annual targets that are directly related to the objectives of EE youth clubs be done which can be used for trends analysis.

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Appendix 3.1. The CATES and CCROT.

SECTION A					
Environmental Club youth Club Details		**Gender**		**Age**	**Name of the District**
Name of EE youth Club/name of school	Position in the EE Club	Male	Female		**Name of Residential area**

SECTION B				
There is no right or wrong answers, only difference of opinion. **Circle** the letter reflects your true feelings				
	Strongly Agree (A)	Agree (B)	Neutral /Disagree (C)	Strongly Disagree (D)
1. I am in favour of saving wilderness areas, even if few people ever get a chance to go there	A	B	C	D
2. Poisonous snakes that pose a threat to people should be killed	A	B	C	D
3. If a plant or animal is of no use to humans, then we don't need to waste our time and money trying to protect it	A	B	C	D
4. If I had to choose between protecting a natural area and creating homes for humans, I would choose to protect the area	A	B	C	D
5. Government should pass laws to make recycling mandatory so that everyone is forced to recycle.	A	B	C	D
6. Preserving wild areas is not important because we are good at managing wildlife	A	B	C	D
7. Industries should have to pay for any pollution they cause	A	B	C	D
8. There is no point in getting involved in environmental issues since governments and industries have all the power and can do whatever they want to	A	B	C	D
9. I am interested in spending time working to help the environment, even though I realize this will cut into my free time	A	B	C	D

10.
Rank the following by **cycling** in order of importance from 1 to 10

- Do you worry about water	1	2	3	4	5	6	7	8	9	10

- Do you worry about dying	1	2	3	4	5	6	7	8	9	10
- Do you worry about death	1	2	3	4	5	6	7	8	9	10
- Do you worry about air pollution	1	2	3	4	5	6	7	8	9	10
- Do you worry about environmental pollution	1	2	3	4	5	6	7	8	9	10
- Do you worry about drugs	1	2	3	4	5	6	7	8	9	10
- Do you worry about doing well in school	1	2	3	4	5	6	7	8	9	10
- Do you worry about what is happening to animals	1	2	3	4	5	6	7	8	9	10
- Do you worry about car accident	1	2	3	4	5	6	7	8	9	10

Appendix 3.2. The standardized open questionnaire for assessing if selected EE target are met from 2010 to 2016 financial year.

Please complete the questionnaire by providing answers to below-listed questionnaire

SECTION A		
Designation	**Regional Office**	**Number of years in service**
SECTION B		
Activities	1. What activities are done during the environmental youth club support?	
	2. What are the environmental youth club support marketing methods	
	3. What are the delivery mechanisms for environmental youth club support	
Outputs (each activity must be linked to corresponding output)	1. What are the environmental youth club support outputs	
	2. Number of environmental youth club established	
	3. Number of environmental youth club initiated	
	4. Total number of environmental youth club membership	
Inputs	1. What are the environmental youth club inputs?	
	2. What human resource (staffing) requirements for environmental youth club	
	3. What are the budget requirements for environmental youth club	
Outcomes	1. What outcomes did we plan to achieve with environmental youth club	
	2. What are the objective from the environmental youth club support strategy	
Impacts	1. What impact are caused by environmental youth club	

Appendix 4.1. Reliability statistics, mean and standard deviation for the individual items of the CATES.

Item-Total Statistics			
Questionnaire Questions (Items)	**Mean**	**Std. Deviation**	**Cronbach's Alpha if Item Deleted**
I am in favour of saving wilderness areas, even if few people ever get a chance to go there	3.28	0.779	0.149
Poisonous snakes that pose a threat to people should be killed	2.47	1.178	0.176
If a plant or animal is of no use to humans, then we don't need to waste our time and money trying to protect it	2.31	1.116	0.155
If I had to choose between protecting a natural area and creating homes for humans, I would choose to protect the area	3.22	0.872	0.135
Government should pass laws to make recycling mandatory so that everyone is forced to recycle.	2.99	1.080	0.135
Preserving wild areas is not important because we are good at managing wildlife	2.45	2.283	0.177
Industries should have to pay for any pollution they cause	3.16	1.032	0.191
There is no point in getting involved in environmental issued since governments and industries have all the power and can do whatever they want to	2.46	1.199	0.158
I am interested in spending time working to help the environment, even though I realize this will cut into my free time	3.33	0.914	0.142

Appendix 4.2. Indicate the nine items questions tested for a significant difference in attitude towards the environment between respondents in terms of gender.

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
Questionnaire Questions (Items)		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
I am in favour of saving wilderness areas, even if few people ever get a chance to go there	Equal variances assumed	1.761	0.185	0.255	411	0.799	0.020	0.076	-0.131	0.170
	Equal variances not assumed			0.253	382.532	0.800	0.020	0.077	-0.132	0.171
Poisonous snakes that pose a threat to people should be killed	Equal variances assumed	1.715	0.191	-1.378	412	0.169	-0.159	0.115	-0.385	0.068
	Equal variances not assumed			-1.373	394.269	0.171	-0.159	0.116	-0.386	0.069
If a plant or animal is of no use to humans, then we don't need to waste our time and money trying to protect it	Equal variances assumed	0.034	0.854	0.970	408	0.333	0.107	0.110	-0.109	0.323
	Equal variances not assumed			0.972	399.768	0.332	0.107	0.110	-0.109	0.322
If I had to choose between protecting a natural area and creating homes for humans, I would choose to protect the area	Equal variances assumed	0.207	0.649	0.242	405	0.809	0.021	0.087	-0.150	0.192
	Equal variances not assumed			0.243	398.957	0.808	0.021	0.087	-0.150	0.192
Government should pass laws to make recycling mandatory so that everyone is forced to recycle.	Equal variances assumed	4.330	0.038	3.201	410	0.001	0.341	0.107	0.132	0.551
	Equal variances not assumed			3.226	408.790	0.001	0.341	0.106	0.133	0.549
Preserving wild areas is not important	Equal variances assumed	1.351	0.246	0.904	412	0.366	0.199	0.220	-0.234	0.632

because we are good at managing wildlife	Equal variances not assumed			0.846	221.746	0.399	0.199	0.236	-0.265	0.663
Industries should have to pay for any pollution they cause	Equal variances assumed	.108	0.743	-0.331	407	0.741	-0.035	0.106	-0.243	0.173
	Equal variances not assumed			-0.331	391.128	0.741	-0.035	0.106	-0.244	0.173
There is no point in getting involved in environmental issued since governments and industries have all the power and can do whatever they want to		1.445	0.230	-0.328	410	0.743	-0.039	0.119	-0.273	0.195
	Equal variances not assumed			-0.329	403.609	0.742	-0.039	0.119	-0.272	0.194
I am interested in spending time working to help the environment, even though I realize this will cut into my free time	Equal variances assumed	2.403	0.122	2.170	410	0.031	0.195	0.090	0.018	0.372
	Equal variances not assumed			2.189	408.539	0.029	0.195	0.089	0.020	0.371

Appendix 4.3. Indicate the nine items questions tested for significant difference in attitude towards the environment between respondents in terms of age groups.

One-Way ANOVA						
Questionnaire Questions (Items)		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
I am in favour of saving wilderness areas, even if few people ever get a chance to go there	Between Groups	2.708	5	0.542	0.912	0.473
	Within Groups	232.219	391	0.594		
	Total	234.927	396			
Poisonous snakes that pose a threat to people should be killed	Between Groups	35.372	5	7.074	5.429	0.001
	Within Groups	509.545	391	1.303		
	Total	544.917	396			
If a plant or animal is of no use to humans, then we don't need to waste our time and money trying to protect it	Between Groups	6.960	5	1.392	1.143	0.337
	Within Groups	471.350	387	1.218		
	Total	478.310	392			
If I had to choose between protecting a natural area and creating homes for humans, I would choose to protect the area	Between Groups	6.554	5	1.311	1.713	0.131
	Within Groups	293.846	384	0.765		
	Total	300.400	389			
Government should pass laws to make recycling mandatory so that everyone is forced to recycle.	Between Groups	4.843	5	0.969	.841	0.521
	Within Groups	448.155	389	1.152		
	Total	452.997	394			
Preserving wild areas is not important because we are good at managing wildlife	Between Groups	18.531	5	3.706	0.717	0.611
	Within Groups	2017.133	390	5.172		
	Total	2035.664	395			
Industries should have to pay for any pollution they cause	Between Groups	6.320	5	1.264	1.158	0.330
	Within Groups	420.371	385	1.092		
	Total	426.691	390			

There is no point in getting involved in environmental issued since governments and industries have all the power and can do whatever they want to	Between Groups	32.642	5	6.528	4.772	0.001
	Within Groups	532.193	389	1.368		
	Total	564.835	394			
I am interested in spending time working to help the environment, even though I realize this will cut into my free time	Between Groups	2.256	5	0.451	0.535	0.750
	Within Groups	329.068	390	0.844		
	Total	331.323	395			

Appendix 4.4. Indicate the nine items questions tested for a significant difference in attitude towards the environment between respondents in terms of residential district municipality.

One-Way ANOVA						
Questionnaire Questions (Items)		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
I am in favour of saving wilderness areas, even if few people ever get a chance to go there	Between Groups	8.456	3	2.819	4.772	0.003
	Within Groups	247.501	419	0.591		
	Total	255.957	422			
Poisonous snakes that pose a threat to people should be killed	Between Groups	24.279	3	8.093	6.095	0.001
	Within Groups	557.662	420	1.328		
	Total	581.941	423			
If a plant or animal is of no use to humans, then we don't need to waste our time and money trying to protect it	Between Groups	0.738	3	0.246	0.200	0.897
	Within Groups	512.252	416	1.231		
	Total	512.990	419			
If I had to choose between protecting a natural area and creating homes for humans, I would choose to protect the area	Between Groups	1.119	3	0.373	0.480	0.696
	Within Groups	319.974	412	0.777		
	Total	321.094	415			
Government should pass laws to make recycling mandatory so that everyone is forced to recycle.	Between Groups	13.763	3	4.588	3.933	0.009
	Within Groups	487.630	418	1.167		
	Total	501.393	421			
Preserving wild areas is not important because we are good at managing wildlife	Between Groups	7.032	3	2.344	0.476	0.699
	Within Groups	2063.180	419	4.924		
	Total	2070.213	422			
Industries should have to pay for any pollution they cause	Between Groups	18.195	3	6.065	5.573	0.001
	Within Groups	449.507	413	1.088		

	Total	467.703	416			
There is no point in getting involved in environmental issued since governments and industries have all the power and can do whatever they want to	[redacted]	20.845	3	6.948	4.970	0.002
	Within Groups	584.368	418	1.398		
	Total	605.213	421			
I am interested in spending time working to help the environment, even though I realize this will cut into my free time	Between Groups	7.094	3	2.365	2.818	0.039
	Within Groups	350.719	418	0.839		
	Total	357.813	421			

Appendix 4.5 Reliability statistics, mean and standard deviation for the individual items of the Childhood Concerns Rank Order Task.

Item-Total Statistics			
Questionnaire Questions (Items)	Mean	Std. Deviation	Cronbach's Alpha if Item Deleted
Do you worry about water	4.78	0.753	0.661
Do you worry about dying	3.76	1.639	0.627
Do you worry about death	3.64	1.635	0.606
Do you worry about air pollution	4.42	1.109	0.631
Do you worry about environmental pollution	4.42	1.120	0.623
Do you worry about drugs	3.06	1.875	0.680
Do you worry about doing well in school	4.49	1.238	0.662
Do you worry about what is happening to animals	4.35	1.166	0.646
Do you worry about car accident	4.16	1.340	0.639

Appendix 4.6. Indicate the nine items questions tested for the significant difference for concerns tasks ranking order between respondents in terms of gender.

Independent Samples Test

Questionnaire Questions (Items)		Levene's Test for Equality of Variances: F	Sig.	t-test for Equality of Means: T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference: Lower	Upper
Do you worry about water	Equal variances assumed	0.306	0.580	-0.235	402	0.814	-0.020	0.083	-0.183	0.144
	Equal variances not assumed			-0.233	371.726	0.816	-0.020	0.084	-0.184	0.145
Do you worry about dying	Equal variances assumed	13.354	0.001	-2.047	397	0.041	-0.332	0.162	-0.651	-0.013
	Equal variances not assumed			-2.023	360.439	0.044	-0.332	0.164	-0.655	-0.009
Do you worry about death	Equal variances assumed	6.762	.010	-2.384	398	0.018	-0.387	0.162	-0.706	-0.068
	Equal variances not assumed			-2.367	372.804	0.018	-0.387	0.164	-0.709	-0.065
Do you worry about air pollution	Equal variances assumed	0.389	1.533	-0.276	393	0.783	-0.032	0.117	-0.261	0.197
	Equal variances not assumed			-0.275	375.994	0.783	-0.032	0.117	-0.262	0.197
Do you worry about environmental pollution	Equal variances assumed	19.395	0.001	-2.637	393	0.009	-0.307	0.116	-0.536	-0.078

	Equal variances not assumed			-2.576	329.522	0.010	-0.307	0.119	-0.541	-0.073
Do you worry about drugs	Equal variances assumed	0.066	0.798	0.501	398	0.617	0.094	0.188	-0.275	0.464
	Equal variances not assumed			0.501	384.899	0.616	0.094	0.188	-0.275	0.463
Do you worry about doing well in school	Equal variances assumed	0.005	0.942	0.032	389	0.975	0.004	0.124	-0.239	0.247
	Equal variances not assumed			0.032	371.765	0.975	0.004	0.124	-0.239	0.247
Do you worry about what is happening to animals	Equal variances assumed	1.085	0.298	0.811	393	0.418	0.095	0.117	-0.136	0.326
	Equal variances not assumed			0.816	384.128	0.415	0.095	0.117	-0.134	0.325
Do you worry about car accident	Equal variances assumed	1.076	0.300	-1.125	399	0.261	-.152	0.136	-0.419	0.114
	Equal variances not assumed			-1.117	374.688	0.265	-0.152	0.136	-0.421	0.116

Appendix 4.7. Indicate the nine items questions tested for a significant difference in concerns tasks ranking order between respondents in terms of age.

One-Way ANOVA						
Questionnaire Questions (Items)		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Do you worry about water	Between Groups	15.195	5	3.039	4.424	0.001
	Within Groups	263.098	383	0.687		
	Total	278.293	388			
Do you worry about dying	Between Groups	22.767	5	4.553	1.721	0.129
	Within Groups	1000.223	378	2.646		
	Total	1022.990	383			
Do you worry about death	Between Groups	9.724	5	1.945	0.721	0.608
	Within Groups	1022.052	379	2.697		
	Total	1031.777	384			
Do you worry about air pollution	Between Groups	21.369	5	4.274	3.203	0.008
	Within Groups	500.369	375	1.334		
	Total	521.738	380			
Do you worry about environmental pollution	Between Groups	10.287	5	2.057	1.481	0.195
	Within Groups	517.998	373	1.389		
	Total	528.285	378			
Do you worry about drugs	Between Groups	81.302	5	16.260	4.889	0.001
	Within Groups	1263.809	380	3.326		
	Total	1345.111	385			
Do you worry about doing well in school	Between Groups	4.570	5	0.914	0.601	0.699
	Within Groups	565.919	372	1.521		
	Total	570.489	377			
Do you worry about what is happening to animals	Between Groups	6.041	5	1.208	0.874	0.499

	Within Groups	517.146	374	1.383		
	Total	523.187	379			
Do you worry about car accident	Between Groups	6.268	5	1.254	0.690	0.631
	Within Groups	690.177	380	1.816		
	Total	696.446	385			

Appendix 4.8. Indicate the items questions tested for significant difference in concerns task ranking order between respondents due to residential district municipality.

One-Way ANOVA						
Questionnaire Questions (Items)		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Do you worry about water	Between Groups	2.430	3	0.810	1.133	0.335
	Within Groups	292.364	409	0.715		
	Total	294.794	412			
Do you worry about dying	Between Groups	32.726	3	10.909	4.255	0.006
	Within Groups	1035.723	404	2.564		
	Total	1068.449	407			
Do you worry about death	Between Groups	33.676	3	11.225	4.383	0.005
	Within Groups	1037.326	405	2.561		
	Total	1071.002	408			
Do you worry about air pollution	Between Groups	12.054	3	4.018	3.023	0.030
	Within Groups	531.728	400	1.329		
	Total	543.782	403			
Do you worry about environmental pollution	Between Groups	8.501	3	2.834	2.099	0.100
	Within Groups	538.650	399	1.350		
	Total	547.151	402			
Do you worry about drugs	Between Groups	35.768	3	11.923	3.473	0.016
	Within Groups	1390.315	405	3.433		
	Total	1426.083	408			
Do you worry about doing well in school	Between Groups	4.583	3	1.528	1.030	0.379
	Within Groups	587.415	396	1.483		

	Total	591.998	399			
Do you worry about what is happening to animals	Between Groups	7.075	3	2.358	1.738	0.159
	Within Groups	542.734	400	1.357		
	Total	549.809	403			
Do you worry about car accident	Between Groups	17.442	3	5.814	3.245	0.022
	[illegible]	727.446	406	1.792		
	Total	744.888	409			