Environmental consciousness among students

by

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Declaration

I declare that the dissertation submitted by me for the Master of Arts with specialisation in Sociology at the University of the Free State is my independent work and it has not been submitted at any other university. I have duly acknowledged all sources referred to in this study. I cede copyright of my dissertation in favour of the University of the Free State.

Sincerely,

Bonolo Esther Mahlatsi

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Dedication

I dedicate this dissertation to my late parents, in their absence, for the bittersweet motivation to complete my studies. I dedicate this dissertation to myself also for all the hard work I put in to achieve my goal.

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List of Abbreviations and Acronyms

ANOVA – Analysis of Variance

API – Air Pollution Index

APPA – Atmospheric Pollution Prevention Act

AQA – Air Quality Act

CAQDAS - Computer Assisted Qualitative Data Analysis Software

CER – Centre for Environmental Rights

CO – Carbon Monoxide

DWW – Dominant Western Worldview

EC – Environmental Consciousness

FA – Factor Analysis

FMF – FeesMustFall

GDP – Gross Domestic Product

GGM – Gaussian Graphical Model

HEIs – Higher Education Institutions

HEP – Human Exemptionalist Paradigm

HIV/Aids – Human Immunodeficiency Virus/ Acquired Immunodeficiency Syndrome

NDP – National Development Plan

NEET – Not Employed or in Education or Training

NEMA – National Environmental Management Act

NEMAQA – National Environmental Management Air Quality Act

NEP – New Environmental Paradigm

NGO – non-governmental organisations

NOx – Nitrogen Oxides

NWU – North West University

PBC – Perceived Behavioural Control

PC – Principal Component

PED – Population Environment Development

RMSEA – Root Mean Square Error of Approximation

SASAS – South African Social Attitudes Survey

SDGs – Sustainable Development Goals

SO_x – Sulfur Oxides

SPSS – Statistical Package for the Social Sciences

TPB – Theory of Planned Behaviour

TRA – Theory of Reasoned Action

UCT – University of Cape Town

UFS – University of the Free State

UJ – University of Johannesburg

UNECC – University Network of European Capitals of Culture

UN – United Nations Population Division

UN HESD – United Nations Higher Education and Research for Sustainable Development

UN HESI – United Nations Higher Education Sustainability Initiative

QS - Quacquarelli Symonds

WCU – World-Class Universities

WHO – World Health Organisation

X - Twitter

Abstract

Determining individuals' levels of environmental consciousness is essential in research. Concern about the environment is growing because of the increasing environmental degradation caused by human activities. Environmental consciousness is a term that has become more popular in recent years as environmental problems, largely caused by human activities, have accelerated. Environmental consciousness is a multifaceted concept with four dimensions, including environmental attitude, knowledge, value, and motivation. Environmental consciousness also entails socio-economic and psychological factors relating to an individual's propensity to engage in pro-environmental behaviour. It focuses on people's understanding of the environment, its problems, and processes.

The relationship between humans and the environment has been one-sided for centuries, which has resulted in overwhelming and irreparable damage to the environment and ecosystems. This damage is largely due to human consumption causing the vulnerability of social systems. Since environmental problems have escalated to a global agenda, society is starting to question its environmental attitudes and behaviours; there seems to be an attitude-behaviour gap that exists in society. Human consumption and the extinction of species are not considered to be pressing environmental issues, which is problematic. Therefore, engaging people about their environmental behaviour and attitudes towards the environment is essential. Previous studies on environmental consciousness have focused more on consumer behaviour rather than on students' attitudes and awareness of environmental issues. Therefore, there is a gap in the literature about young people's attitudes to the environment, their awareness of environmental issues, and their perceptions of environmental sustainability. This gap in the literature is especially true in the South African context. The scant research is evidence that students' perceptions of environmental problems are not well-known. Furthermore, how students learn about the environment is not integrated into their primary or secondary schooling or even into higher education curricula. Indeed, understanding the environmental attitudes and behaviour of university students has become a salient topic at South African universities because environmental attitudes and behaviour play a key role in shaping students' perceptions of the environment at large. Furthermore, many environmental actions taken today are not actually based on protecting the environment from the influence of human activity and consumption. Rather, protecting the environment is a key social and political issue.

Therefore, this study aims to explore what South African students' perceptions of the environment are and what their level of environmental consciousness is. The study also intends to investigate whether students are indifferent or ambivalent towards the environment and environmental issues and, if so, what the reasons behind this attitude are.

The study employed a mixed methods approach embedded in a cross-sectional study. The researcher embedded methodological triangulation to cross-validate the findings of the study to provide a comprehensive analysis. The target population consisted of both undergraduate and postgraduate students. The population also consisted of students from all genders, ages, ethnic groups, and faculties. The random sample size consisted of 380 respondents (at a 95% confidence level and 5% confidence interval). To allow for an estimated sample mortality of 35%, a total sample size of 585 was decided upon. The sampling design was determined with the Simple Random Size calculator.

There were two data collection phases. Phase one (the quantitative component embedded in an exploratory survey design) entailed the dissemination of an online survey. The online survey was administered to a sample of registered students at all three campuses of the University of the Free State (the Bloemfontein, South, and QwaQwa campuses). Phase two (the qualitative component involved inviting the respondents who had completed the online survey to participate in mini groups. A sequential explanatory approach was embedded in the data-gathering processes of both phases. The study adopted a six-step reflexive thematic analysis to examine the participants' experiences and perceptions of environmental issues.

Factor analysis was conducted to reduce the large dataset into a smaller one made up of fewer factors. Exploratory factor analysis was used in the early stages of the data analysis to explore the interrelationships between the set of variables contained in the study's five scales. Furthermore, Cronbach's alpha coefficients were measured to determine the reliability and validity of the items contained in the scales; only highly dependable coefficients with values between 0.80 and 1.00 were reported. There were 416 respondents who completed the online survey and nine participants who participated in the mini groups. The findings revealed that students had both anthropogenic and ecologically-minded worldviews; they also had mixed reactions to the environment and environmental issues and were either exemptionalists or ecologically-minded. The participants were aware of environmental issues and of their behaviour towards the environment, despite some limitations. The respondents were, for example, unwilling to engage in public demonstrations to protect the environment, despite their strong involvement in the fallist movements of 2015/16 at South African universities. There is,

therefore, a need to change their perceptions about the environment, especially with regard to protecting the environment. The results of the study do, however, show that there is potential to grow the environmentalism movement among students.

Environmental problems have a significant impact on humans in the same way that other social problems, such as crime, unemployment, and poverty do. The study revealed that some social issues such as crime, unemployment and poverty are considered more important than environmental issues, despite the intersecting nature of social issues with environmental issues; environmental awareness should thus be afforded the same level of recognition and importance. The findings also revealed that education plays a role in determining an individual's level of environmental consciousness.

Overall, the research confirmed some of the findings from previous similar studies. The findings confirm that the participants often do not understand the human-nature relationship. Environmental issues seem to be a low-level concern for most people, while social issues, such as unemployment, crime, and gender-based violence, are considered more worthy of governmental intervention. However, environmental issues need to be treated with the same level of urgency as other social issues, and young people should start to act as the voices of the environment.

Key terms: environment, environmental consciousness, students, environmental degradation, environmental issues, environmental problems, environmentalism, environmental education, environmental concern.

Chapter 1: Introduction

This research aims to determine students' levels of environmental consciousness in an institution of higher education, namely the University of the Free State (UFS). This chapter provides background to the study and more detail about the study's rationale, problem statement, research questions, research aims, and objectives. This chapter also states the significance of the study and provides the definitions of core concepts.

1.1 Background and rationale

Humanity has faced numerous pressing social issues such as poverty, unemployment, and crime since the earliest civilisation. Some of the most daunting social issues in the current millennium either emanate from or are associated with environmental problems (Younis, 2015). Environmental problems are defined as unfavourable conditions rooted in changes to the ecological balance of nature (Gülüm, 2011). These environmental problems are increasing to such an extent that the future of life on Earth has become a matter of concern to many observers (Meyer, 2018). The environment can broadly be defined as the natural surroundings of communities that contain natural resources such as air, land and water. The availability and accessibility of environmental resources shape the livelihood and overall health of communities (Hunter, Strife & Twine, 2010), essentially making the environment an integrated bio-geo-physical system (Nash et al., 2019).

Since the advent of the Industrial Revolution, the global environment has drastically changed due to increased carbon emissions in the atmosphere caused by human consumption, economic development, and pollution (Gallo et al., 2020). Since the beginning of the Industrial Revolution, humans have been abusing the planet at an unprecedented scale. The result is that humans now face a number of environmental problems that impact their daily lives. Almost all resources, such as water, air, and land, are being overused and polluted to the extent that large-scale environmental crises have become a reality (Meyer, 2018). Furthermore, changes in the global environment, resulting from the harmful effects of human impact on the environment and its natural systems, have caused multiple environmental issues. Human consumption and economic behaviour have been the main contributors to climate change. They have led to the increased production of greenhouse gases and global warming, which have had serious consequences for global biophysical and social systems (Sage, 2019). The world's most acute environmental problems (such as deforestation, air pollution and biodiversity) are affected by

economic and daily living activities, such as the consumption and trade of natural resources. Therefore, any damage done to the environment can disrupt people's livelihoods, their households (by causing health problems, financial difficulties and property damage due to floods) and the economy, and people may encounter job losses if there is no economic activity (Hunter, Strife & Twine, 2010). Humans have inhabited the environment for several centuries now. Humans have always had to devise survival strategies and develop new tools and technology to deal with a changing environment. What is different now is the unprecedented scale and speed at which we have to adapt to a changing environment due to climate change. The use of technology is one such survival strategy, but it too has a direct impact on the environment; the consequences of its use have led to environmental degradation (Akintunde, 2017).

In the 1970s, sociologists started studying the important interaction between society and the environment as well as the relationship between the two (Steward & Zaaiman, 2015). Having done so, they called for the urgent need to reconcile the environment and humanity since humans have struggled to live and exist in harmony with nature or the environment. However, environmental problems in the 1970s were largely considered an aesthetic issue (Wille, 1996). During this time, research endeavours and public attention focused on controlling litter and preserving wildlife areas for human entertainment, enjoyment, and aesthetic purposes. In the 1980s, however, there was a change in people's perceptions of environmental problems. People in society noticed that environmental issues were starting to reduce their quality of life and threaten human life (Wille, 1996). Since then, there have been daily warnings about the consequences of not addressing environmental problems. Biologically and geographically, both the environment and social factors (unemployment, poverty, and social inequality) affect individuals directly and indirectly. The environment also affects people's spiritual and material development and living conditions (Eroglu, Bektas & Tarkin, 2016). For humans, the role of the environment is to sustain life, and there is a close relationship between human perceptions and attitudes towards the environment and their practice (Gülüm, 2011). Since environmental problems have become a global agenda, peoples' attitudes toward the environment have become questionable as environmental problems continue to escalate (Eroglu, Bektas & Tarkin, 2016).

The classifications and typologies of environmental problems may differ amongst authors, but most agree that there are seven core environmental problems, namely deforestation, global warming, air pollution, waste disposal, water quantity and quality issues, population growth,

and agricultural problems (Cylke, 1993). However, this list represents a fraction of the environmental problems experienced globally since it only represents the most serious threats prevalent in the 1980s and 1990s (Cylke, 1993; Nabileyo, 2019). In the 21st century, the excessive release of greenhouse gases into the atmosphere has resulted in anthropogenic climate change, which also presents a great challenge to the environment. The release of greenhouse gases has resulted in the prevalent global climate crisis that warrants an exploration into the relationship between humans and nature. Indeed, research on the relationship between humans and the natural environment is grossly lacking (Stewart & Zaaiman, 2015; Nabileyo, 2019). Man-made climate change has been threatening the biosphere and all forms of life that depend on it. It has also resulted in environmental changes that are now seriously threatening social and human well-being across the globe (Foley et al., 2018; Nkoana, 2020).

According to the World Economic Forum (2022), climate change, extreme weather, biodiversity loss, human-induced environmental hazards, natural resource crises, social cohesion erosion, and livelihood crises are rife globally. Yet, in modern times, human consumption and the extinction of species are not seen as pressing environmental issues, which is problematic. Furthermore, widespread and accelerated climate change has irreversible consequences (De Wet-Billings, 2022).

For centuries, the relationship between society and the environment has been one-sided, where environmental resources have only been seen as commodities. The one-sided view of this relationship has resulted in overwhelming and irreparable damage to the ecosystem caused by human activity. Such environmental damage has, in turn, caused social systems to become vulnerable (Stewart & Zaaiman, 2015). Therefore, it is crucial to explore and assess people's attitudes, knowledge, and behaviours toward the environment since such an exploration will provide an essential scientific basis on which environmental policies can be based, and the administration of environmental systems can be improved (Abdul-Wahab & Abdo, 2010).

Broadly speaking, people's mindsets about the environment have been shifting, but there is still an attitudinal gap which requires increased knowledge and a change of attitude towards the environment change in attitudes and knowledge (Suama, Nadiroh & Neolaka, 2019). In South Africa, for instance, there have been efforts to bridge the gap in the relationship between humans and the environment. There have also been attempts to positively influence people's environmental perceptions and increase their awareness of environmental sustainability (Mtutu & Thondhlana, 2016). For example, a previous study detailed different green behaviours undertaken by a sample of South African consumers; the study highlighted consumer

behaviours such as recycling, reducing, reusing, and boycotting harmful products (Mkhize & Vigar-Ellis, 2019). Furthermore, the study indicated that South African consumers are moderately conscious about the environment based on their consumer behaviour (Mkhize & Vigar-Ellis, 2019). Although the study about the different green behaviours focused on consumer behaviour and explored consumers' levels of environmental consciousness, it did not focus on students.

In general, a precondition for addressing environmental issues is to raise awareness as a first step in determining the level of people's environmental consciousness. Equally important, environmental consciousness entails certain socio-economic and psychological factors related to the propensity of individuals to engage in pro-environmental actions and behaviour, which can be regarded as attitudinal aspects (Jiménez Sánchez & Lafuente, 2010). People also need to be made aware of the fact that a healthy environment requires sound awareness of environmental issues. Therefore, how people view the environment or environmental issues affects how environmental concerns can be addressed (which is determined by people's environmental behaviour). Environmental behaviour is a phenomenon that needs to be thoroughly conceptualised to bring about much-needed change. Essentially, behavioural change will drive sustainable development (Asilsoy, 2012).

It is, therefore, essential to determine people's knowledge of the environment as well as their attitudes toward the natural environment. This is important research since positive attitudes have been shown to significantly improve and preserve the environment (Masud et al., 2016). The direct and indirect impact of environmental degradation has resulted in the need to initiate social and political reform movements to create relationships between human beings and nature based on a sense of integrity (Younis, 2015). For instance, the United Nations Framework Convention on Climate Change hosted numerous conferences around the globe, aiming to address environmental problems. In 2011, a high-profile conference was held by the University Network of European Capitals of Culture (UNECC) in Durban, South Africa. It focused on pollution and other environmental issues. The conference led to interested parties and world leaders wanting to ascertain what students' levels of environmental consciousness were and determine what students knew about environmental pollution (Olufemi, Mji & Mukhola, 2016).

However, environmental actions today are not based on protecting the environment from the influence of humans and their destructive consumption activities. There is also a need to transform humans' impact on nature and their interaction with it. Seemingly, an attitude-

behaviour gap exists among people. Behavioural change is thus needed for sustainable development, but attitudinal and behavioural change are complex. Inciting behavioural change needs some form of action as information-sharing alone is insufficient to close the gap between people's attitudes and behaviour (Asilsoy, 2012). It is, therefore, important to engage people about their behaviour towards the environment and environmental issues more broadly in a space that is closer to home. Furthermore, the attitudinal gap between individuals and their actions toward the environment warrants studying the factors that influence their attitudes and behaviours (Younis, 2015). Such interaction (between attitude and behaviour) is only possible for people to understand if all individuals have sufficient levels of environmental consciousness (Cherdymova et al., 2018). Solving environmental problems has been difficult because individuals are often not directly affected by the environmental problems induced by anti-environmental behaviour. (Macovei, 2015).

In essence, protecting the environment has become a key social and political issue. It has also become an important area in academic research (Meyer, 2018). Yet, there appears to be a gap in the literature about young people's attitudes to the environment, their awareness of environmental issues, and their perceptions of environmental sustainability, particularly in South Africa (Mtutu & Thondhlana, 2016).

1.2 Problem statement

Many environmental problems have been created by humans' anthropogenic impact on the environment stemming from human activity (Younis, 2015; Mayerl & Best, 2019). Concerns about the natural environment are ever-increasing, and environmentalists have called for a change in people's basic values, principles, and attitudes toward the environment (Nkoana, 2020). The assumption is that a change in people's attitudes toward the environment will promote the holistic conservation of nature rather than the atomistic preservation of parts of the environment that have a utilitarian purpose for humans. Therefore, it is important to measure what people's attitudes toward the environment are as this will enable greater insight into how to shift away from the dominant mode of thinking that have caused environmental issues (La Trobe & Acott, 2000). In determining how human activities have affected the environment, it is important to understand the environmental culture and the level of environmental education of a particular group of people. In general, not knowing about environmental issues hinders people and communities from making informed decisions about

adopting sustainable practices, understanding environmental issues and advocating for change (Younis, 2015).

In South Africa, research on environmental issues and environmental consciousness has only examined a few environmental problems, including air pollution, water pollution, and land degradation (Meyer, 2018). Other research has focused on the environmental perceptions of people from previously disadvantaged areas in South Africa. It is evident from the above that little research has been done to determine the levels of young people's environmental consciousness in South Africa. As such, there seems to be a growing need for research to understand how young people perceive environmental problems (Amerigo, Garcia & Cortes, 2017).

Environmental issues, particularly in South Africa, are overshadowed by inequality, access to education, violence, and poverty (De Wet-Billings, 2022). For instance, climate change in South Africa is not high on the list of governmental concerns because other social issues override environmental issues and hinder efforts to address them. In a study exploring the most important challenges in South Africa (De Wet-Billings, 2022), for example, environmental issues were ranked only 17th out of 20 in a ranking of pressing issues in the country (see Figure 1.1 below):

Rank	Most NB! Challenge	Freq.	Percent	Rank	2nd most NB! Challenge	Freq.	Percent	Rank	3rd most NB! Challenge	Freq.	Percent
1	Unemployment	2,067	65.14	1	Crime and safety	1,038	32.71	1	Poverty	890	28.05
2	HIV/AIDS	469	14.78	2	Service provision/delivery	374	11.79	2	Corruption	816	25.72
3	Crime and safety	357	11.25	3	Corruption	315	9.93	3	Education	198	6.24
4	Racism	81	2.55	4	Unemployment	307	9.68	4	Other (specify)	189	5.96
5	Service provision/delivery	46	1.45	5	Education	220	6.93	5	Crime and safety	154	4.85
6	Xenophobia	25	0.79	6	Affordable housing	184	5.8	6	Political issues	136	4.29
7	Political issues	21	0.66	7	Economic and financial issues	142	4.48	7	Service provision/delivery	135	4.25
8	Economic and financial issues	20	0.63	8	Racism	115	3.62	8	Economic and financial issues	119	3.75
9	Affordable housing	19	0.6	9	Political issues	109	3.44	9	Affordable housing	104	3.28
10	Education	18	0.57	10	Human rights	67	2.11	10	Environmental issues	101	3.18
11	(Do not know)	13	0.41	11	Xenophobia	63	1.99	11	(No answer)	73	2.3
12	Human rights	10	0.32	12	Land reform issues	58	1.83	12	Family and youth issues	61	1.92
13	Land reform issues	7	0.22	13	Work-related issues	43	1.36	13	Work-related issues	51	1.61
14	Corruption	5	0.16	14	Poverty	38	1.2	14	Racism	37	1.17
15	Work-related issues	4	0.13	15	Environmental issues	33	1.04	15	Human rights	34	1.07
16	Religion and culture issues	4	0.13	16	Family and youth issues	28	0.88	16	Land reform issues	32	1.01
17	Environmental issues	3	0.09	17	(No answer)	26	0.82	17	Xenophobia	22	0.69
18	Family and youth issues	2	0.06	18	Religion and culture issues	8	0.25	18	Religion and culture issues	17	0.54
19	Poverty	1	0.03	19	Other (specify)	4	0.13	19	(Do not know)	2	0.06
20	(No answer)	1	0.03	20	HIV/AIDS	1	0.03	20	HIV/AIDS	1	0.03
								21	Unemployment	1	0.03
	Total	3,173	100		Total	3,173	100		Total	3,173	100

Table 1.1 The ranking of the topmost important challenges in South Africa

Source: De Wet-Billings, 2022

Table 1.1 illustrates the long-standing social issues in South Africa and ranks them in order of priority/concern (from highest to lowest); it can be observed that environmental issues are ranked among the lowest concerns in the country. The table above contains three lists of various rankings of social issues. Environmental issues are ranked 17th on the first list, 15th on the second list and 10th on the third list of most important challenges. Comparatively, crime and safety consistently rank among the top 5 issues in all three lists and service delivery ranks in the top 7 in all three lists. What can be observed from the table above is that environmental issues are ranked low as the most challenging issues (according to the source and study referenced). The ranking of social issues was taken from a cross-sectional study conducted using the 2017 South African Social Attitudes Survey (SASAS) that contained core standard variables that assessed a set of behavioural, demographic, and attitudinal variables among the South African population. The survey aimed at monitoring change and assessing social, economic, and political values at the time it was conducted. From the survey, the three most important challenges identified included unemployment, HIV/Aids, and crime (De Wet-Billings, 2022).

The key matter is that South Africa needs to prioritise environmental concerns whilst also tackling other social issues such as unemployment, inequality, and poverty. If an environmental

issue, like water scarcity continues to grow in South Africa, it will pose a development issue, considering the low-ranking status of environmental issues (De Wet-Billings, 2022). The abovementioned study by De Wet-Billings (2022) focused on the overall population of South Africa; however, no specific attention was given to student perceptions. It can, therefore, be deduced that students' perceptions of environmental problems are not well-known.

Moreover, how students learn about the environment has not been integrated into their learning at school or university. There is an assumption that students' knowledge about the environment can be positively associated with looking after the environment (Khoiri et al., 2021). However, the lack of integration of environmental education into students' learning is problematic as students spend most of their time in school and studying at institutions of higher education. During their time at these institutions, their perceptions of the world, as well as their personalities, are being shaped. These perceptions and attitudes are harder to change in the future as they grow older (Veselinovska & Osogovska, 2012).

Many students in Africa come from previously disadvantaged backgrounds and, therefore, can provide perspective on environmental issues on behalf of their communities (Dlamini et al., 2021 a). In South Africa, many students are studying at one of the 26 public universities across the country. Through mass movements, they have become politically active in expressing their frustrations over dysfunctional funding systems, socioeconomic class distinctions, and educational inequalities (Foley et al., 2018). Despite their activism on a range of issues that affect them, South African students seem indifferent and ambivalent to environmental issues (Dlamini et al., 2021a). A study previously conducted at the University of Dammam in Saudi Arabia by Dlamini et al. (2021b), for example, called attention to the lack of studies about students' perceptions of environmental issues in developing economies. The study showed that most studies focus on the Global West. Furthermore, the study highlighted that in Western studies, students exhibited high levels of environmental awareness and the willingness to support and address environmental issues. The same study showed that South African students have little awareness of environmental issues (Dlamini et al., 2021a).

It is important to consider what level of understanding young people have of environmental issues since they are the future generation that will need to have a good understanding of such issues. A politically and culturally diverse country, such as South Africa, needs students who support the need to address environmental issues for sustainability purposes. The diverse backgrounds of students mean they will perceive environmental issues from different perspectives. Understanding student perceptions about the environment may, in turn, enable

reflection on wider environmental issues and where they originated. Moreover, students' knowledge of the environment or environmental issues can provide insight into whether universities can employ sustainable environmental practices or how to better implement such practices based on what students know and understand about environmental issues (Dlamini et al., 2021a). It is therefore important to know what environmental perceptions young people hold because they will influence society in the future. If the youth of today are environmentally conscious, it is likely that the larger society will also strive for positive environmental change and protection. In essence, environmental management can be achieved if students' perceptions about the environment are understood because environmental perceptions can assist in understanding environmental behaviours (Dlamini et al., 2021a).

Therefore, there is a need for more rigorous studies to examine the awareness and behaviour of students across South African universities with regard to environmental issues and environmental consciousness. This need is driven by the fact that South African universities attract students from different backgrounds. It has been suggested that students' backgrounds are an important determinant of their awareness and perceptions of environmental issues (Murwirapachena et al., 2017). People's attitudes and perceptions about the environment need to change to address environmental problems. As much as the quality of the environment is monitored, it is equally important to monitor people's perceptions of the extent to which the environment is degrading. It is also important to monitor their decision-making abilities regarding environmental issues. Therefore, young people's perceptions of the environment and environmental issues should be matters of public concern (Meyer, 2018). Integrating environmental awareness into curricula at higher education institutions is one way to achieve environmental change. As such, it is essential to investigate students' environmental attitudes as they are more susceptible to adopting new attitudes and perceptions. Also, students can carry their newfound attitudes towards environmental issues into their communities since they will become future policymakers (Coetzee, Evert & Nell, 2021).

1.3 Research questions

Stemming from the above discussion, the research questions that informed the design and focus of the study are outlined below:

- To what extent are students environmentally conscious, particularly regarding pressing global and South African environmental issues?

- Where do students rank the environment amidst other issues of personal and economic concern?
- What are students' perceptions of the environment, and what determines their environmental perceptions and behaviour?
- What do students perceive as the most important drivers of environmental changes and degradation, particularly in South Africa?
- Do biographic variables, such as sex, race, and socio-economic background, influence differences in students' attitudes towards environmental problems?

1.4 Research aim and objectives

This study aimed to determine the extent to which students at the University of the Free State (UFS) are environmentally conscious. The main objectives of the study were to:

- explore the levels of environmental knowledge, awareness, and perceptions of students;
- determine students' perceptions about the relative importance of both global and local environmental issues;
- ascertain the environmental attitudes and actions of students and their willingness to protect the environment;
- explore any possible correlations between students' perceptions of environmental issues and their socio-demographic attributes; and
- formulate guidelines to increase environmental awareness among young people, and students in particular.

1.5 Significance of the study

Understanding environmental attitudes and behaviour has become a salient topic in institutions of higher learning in South Africa because environmental attitudes and behaviour play an important role in shaping students' perceptions about the environment (Coetzee, Evert & Nell, 2021). To understand environmental attitudes, environmental perceptions need to become the primary focus in analysing the relationship between people and the environment to determine their level of environmental consciousness (Meyer, 2018). At the centre of environmental problems lies human behaviour and the need to promote pro-environmental behaviour

(Thondhlana & Hlatshwayo, 2018). Yet, in general, people are unlikely to act in a pro-environmental way if they are not knowledgeable about the environment. It has also been asserted that the people who are most likely to support the environment are young and educated people (Dlamini et al., 2021a).

In essence, it is important to investigate students' levels of environmental consciousness since such an understanding may provide insight into how they can assist in solving environmental problems, which may also lead to increased environmental awareness on an individual, collective, and societal level. Students' perceptions are likely to lead to their taking important steps toward action (Wong, 2003). In essence, promoting environmental awareness is likely to assist in creating a better future for everyone. The awareness will make people see the importance of sustaining the environment for future generations. Most importantly, if students' awareness of the environment is raised early on, they are more likely to carry this awareness with them into adulthood and pass it on to future generations (Olufemi, Mji & Mukhola, 2016).

1.6 Key concepts of the study

This study was conceptualised using concepts related to the matter being investigated. In some instances, words have been used interchangeably. The concepts that are used throughout the whole study are outlined below.

1.6.1 Students

In this study, 'students' refers to registered undergraduate and postgraduate students (who are either full-time or part-time) at the University of the Free State.

1.6.2 Environmental problems and environmental degradation

Environmental problems refer to the unfavourable conditions that cause ecological imbalances in nature. They are the broader issues that have a negative impact on the environment, and they can be caused by natural events (like volcanic eruptions) or human activities (like pollution). Furthermore, environmental problems encompass a range of concerns such as climate change, pollution (water, land and air), biodiversity, deforestation and resource depletion. They include issues, causes and potential consequences. These issues have worsened to such an extent that future life on Earth has become a matter of concern (Meyer, 2018).

Environmental degradation refers to the process that illustrates the decline in the quality of the environment. The emphasis of it is on the damage that has already been done to the

environment. An example summing the difference between the two is, an environmental problem is plastic pollution, while environmental degradation is the result of damage or harm caused to marine life by plastic pollution.

It is worth mentioning that the two terms ‘environmental problems’ and ‘environmental degradation’ will be used interchangeably in this and subsequent chapters. Although the two terms are often used interchangeably, there is a subtle and important distinction between them. What is also important to note is that several environmental issues have been worsening over the last few decades. This is directly linked to the need to investigate the levels of people’s awareness of environmental problems.

1.6.3 Environmental consciousness

The term ‘environmental consciousness’ refers to the socio-economic and psychological factors that determine people’s environmental behaviour and actions (Jiménez Sánchez & Lafuente, 2010).

1.6.4 Environment

The environment is defined as the natural surroundings of communities that contain natural resources such as water, air, and land.

1.7 Chapter summary

Chapter One has provided an overview of the ecological crisis that warrants this investigation into the relationship between humans and nature by exploring environmental behaviour. Furthermore, the chapter focused on why it is essential to investigate students’ perceptions on environmental issues. Chapter One highlighted why the selected topic was investigated, as well as the relevance of the topic in recent times.

Chapter Two focuses on the literature review and theoretical framework employed in the study. The literature review highlights the importance of existing research on the topic under investigation. The two theories that form the theoretical framework employed in the study are also discussed.

Chapter Three contains the methodological account of the study. The chapter provides a detailed account of the mixed methods approach that was used to explore the topic under investigation. Various methodological aspects, such as the research design, the two-phased

approach, sampling methods, data collection, data analysis, limitations, and ethical considerations, are all discussed in the chapter.

Chapter Four contains the results of the study. All the study findings have been interpreted and analysed against the relevant literature and theoretical frameworks. The chapter consists of three sections, which address the quantitative and qualitative results and integrate some of the findings from both data sources. The chapter concludes with a discussion of the salient aspects that emerged in the findings.

Chapter Five consists of a discussion and interpretation of the main findings, and an integration of the quantitative and qualitative findings. The researcher also highlights the limitations that were associated with the study. Chapter Five also highlights the significance of the two theoretical frameworks employed in the study.

Chapter Six summarises the main findings of the study. In chapter 6, the researcher provides a discussion of the last research objective about the formulation of guidelines to increase environmental awareness among young people, and students in particular. The researcher also provides concluding remarks and highlights the gaps in the body of knowledge that the study addressed. Based on the study's findings, future research implications are also discussed.

Chapter 2: Literature Review and Theoretical Framework

2.1 Introduction

This chapter provides an extensive discussion of the literature relating to environmental consciousness. Furthermore, this literature review chapter highlights the significance of the study in adding a South African student perspective on environmental concerns to the broader body of knowledge on environmental perceptions and attitudes. This chapter begins by discussing the nature and functions of the environment, followed by an overview of the environment and sociology. Next, it discusses environmental problems, the drivers of environmental change, and human-environment interaction. The chapter then conceptualises and considers the dimensions of environmental consciousness, followed by a discussion of the factors that affect students' environmental consciousness. Furthermore, the role of young people in raising environmental awareness and action is also explored. Lastly, the two theories that have informed this study are discussed. The chapter concludes with a summary of the literature review.

2.2 The nature and functions of the environment

The definition of the environment has evolved over the years. It was previously defined according to the social and cultural factors that reflected anthropocentric behaviour (Stewart & Zaaiman, 2015). Anthropocentrism is the notion that humans are a superior species and that nature only exists for humans. Moreover, anthropocentrism argues that the earth is a storehouse of infinite natural resources, and nature is a commodity for human consumption (Stewart & Zaaiman, 2015). For this study, the term environment refers to the natural or biophysical environment, i.e. the “green” environment. There is also an understanding of socially constructed or “brown” environments (i.e., cities) that applies to this study. The artificial environment, formed by humans, has caused most environmental issues.

The environment is where all living things live and maintain their lifetime relationships (Akkor & Gündüz, 2017). The environment also consists of both viable and non-viable factors. Viable environmental factors are humans, animals, plants, and microorganisms. Non-viable factors refer to natural and man-made resources such as water, air, buildings, and landforms (Gumrukcuoglu et al., 2017; Akkor & Gündüz, 2017). The environment can also be divided into two parts: the physical and social environment, which both sustain the lives of living organisms. The artificial environment has been built by humans and is constituted by cities,

towns, and dams (Akkor & Gündüz, 2017). Essentially, the artificial environment has been formed to meet the needs of human beings (Akkor & Gündüz, 2017). The built environment refers to the surroundings made by humans for human activities to take place (Wang et al., 2023). The built environment is considered an essential part of the physical environment and includes land use, transportation, infrastructural support facilities, and urban and architectural designs (Wang et al., 2023). Evidence from existing research on the built environment shows that it has become a critical intervention tool in promoting physical activity. However, physical activity requires the support of the social environment. The social environment refers to individual factors such as gender, age, neurological developments, and genetic dispositions. The social environment also includes social networks such as family, school, peers, work, and other background conditions, including the economy and culture (Wang et al., 2023). The social environment, encompassing human actions and development, has had a profound impact on the natural environment for the past 300 years (Akkor & Gündüz, 2017). Urban traffic, congestion, and car exhausts, for example, have caused much environmental pollution (Wang et al., 2023).

The environment is the total planetary inheritance of all resources; it performs four vital functions. Firstly, the environment serves to supply both renewable and non-renewable resources. Renewable resources can be used without becoming exhausted or depleted. This means that there is a continuous supply of these resources since they replenish themselves over time. Examples include timber, wind, sun, and biomass (Education Services Australia, 2013; Fulekar et al., 2014; National Council of Educational Research and Training, 2022). Non-renewable resources, on the other hand, can become exhausted and depleted through continuous extraction and use. Non-renewable resources include oil, nuclear energy, coal, and gas (fossil fuels). Secondly, the environment assimilates and absorbs waste and pollution produced by human activities. Thus, it serves as the earth's sink, which rids the earth of what humans put into it (Education Services Australia, 2013; Fulekar et al., 2014; National Council of Educational Research and Training, 2022). Humans rely on the environment for recycling and storing their waste, including gaseous emissions from cars, industrial waste, and rubbish.

Thirdly, the environment sustains life through ecosystems without the need for human action. For instance, through climate regulation, natural greenhouses operate effectively to ensure that the atmosphere holds the heat produced by the radiation of solar energy during the day to keep humans warm. Other examples include the earth's natural processes, such as the water cycle, pollination, soil formation, and photosynthesis. Lastly, the environment provides aesthetic

services, which can also be called the earth's spiritual function. The spiritual function of the environment entails the earth's intrinsic recreational and psychological purpose. The extent of this function varies according to people's values, beliefs, and culture. Furthermore, the aesthetic function is about emotions, psychological attachment, and people's perceptions of the environment (how humans experience it) (Education Services Australia, 2013; Fulekar et al., 2014; National Council of Educational Research and Training, 2022).

The environment performs all of the abovementioned functions without disruption if its demands are within its carrying capacity. In other words, the environment can do what it is supposed to if the extraction of resources does not exceed the resource regeneration rate and the waste generated is within the assimilating capacity. However, if the environment is unable to perform its functions or if the capacity exceeds the rate at which environmental resources are used, it will not be able to perform its life-sustaining functions, which will result in environmental crises. Indeed, the world today is experiencing an environmental crisis due to the rising human population and increasing consumption levels, which have placed great stress on the environment and impacted its ability to perform its first two functions (supply resources and assimilate waste) (Education Services Australia, 2013; Fulekar et al., 2014; National Council of Educational Research and Training, 2022). As a result, resources are becoming limited, and waste generation is beyond the environment's absorptive capacity, which is the environment's ability to absorb degradation (National Council of Educational Research and Training, 2022).

Fundamentally, the environment integrates physical, biotic, and chemical elements which influence the lives of all living organisms, particularly their habitat (Akkor & Gündüz, 2017; Gumrukcuoglu et al., 2017). Likewise, the environment comprises water, air, land, and the interrelationship between humans, property, and living organisms (Banerjee & Das, 2014). However, since the advent of the Industrial Revolution (1760-1840), the environment has come under increasing pressure because of anthropogenic activities such as urbanisation, industrialisation, rising energy usage, and harmful agricultural practices. Since the Industrial Revolution, natural resources have been depleted at an accelerating rate because of increased consumption, growing human populations, and rapid urbanisation. The United Nations estimates that by 2030, the global urban population will have increased by more than its rural counterpart (Asilsoy, 2012). The rapid increase in urbanisation will lead to increasingly damaged ecosystems, the production of a wide variety of pollutants, and an increase in global

warming. Moreover, the social structure of communities will be affected, and the urban environment will decay quickly (Asilsoy, 2012).

When defining the environment in South Africa, it is essential to consider the destructive environmental legacy of colonisation. The definition of "environment" in the South African context is linked to a history of disproportionate access to natural resources. In turn, this disproportionate access harmed the interaction between people and the environment. The natural environment in South Africa today remains poorly defined. The current definition, according to the National Environmental Management Act (NEMA) 107 of 1998, refers to the environment as the surroundings in which humans exist and of which they are made (Stewart & Zaaiman, 2015).

2.3 An overview of the environment and sociology

The natural environment, at first glance, may not seem to be a sociological topic. The assumption is often that the environment is studied by meteorologists, geologists, ecologists, and other natural scientists, not social scientists or sociologists. Yet the environment is affected by population growth and other social phenomena (Emari et al., 2016; Hosseinnezhad, 2017). Therefore, the natural environment is a topic of interest for sociologists for several reasons. Firstly, most of the worst environmental problems are the result of human activities that harm the environment. Secondly, environmental problems have a significant impact on humans in the same way that other social problems, such as crime, unemployment, and poverty do. These two reasons emphasise the importance of the natural environment as a sociological topic (Emari et al., 2016; Hosseinnezhad, 2017). Environmental sociologists have identified two dimensions that determine the environment-society relationship. These two dimensions focus on the impact of human activities and decision-making on the environment, as well as the consequences of environmental inequality. Environmental sociology is a sub-discipline within sociology that explores the relationship between societies and the natural environment. Broadly, environmental sociologists study the interaction between humans and the environment. The purpose of such work is to provide key insights into public opinions about the environment, the influence of human values on the environment based on their environmental behaviour, and the impact of environmental problems on societies and individuals (Emari et al., 2016; Hosseinnezhad, 2017).

Attitudes and environmental perceptions are multidimensional and consist of interrelated constructs. Some studies have indicated that people's environmental perceptions and attitudes are shaped by factors that are both internal and external to an individual (Dlamini et al., 2020). Many research efforts in the past have focused on people's perceptions of environmental problems and the factors that encourage individuals to be concerned about the environment (Bennet et al., 2017; Dlamini et al., 2020; Walton & Austin, 2011). In the 1970s, quantitative studies dominated the research that focused on people's environmental awareness; they aimed to constructively measure environmental concerns and attitudes. This was followed by research attempts to measure whether there was a correlation between environmental concern and socio-demographics. Since the 1990s, however, there has been a worsening of the environmental crisis, and sociological studies have attempted to define what determines pro-environmental behaviour (Walton & Austin, 2011). Since then, determining how people perceive the environment has become a prominent topic in research (Bennett et al., 2017). Sociology enables us to understand power dynamics and the fact that environmental crises are evenly distributed throughout society irrespective of gender, culture, race, or class.

2.4 Environmental problems

The environment makes up the surroundings of humans and has an impact on their ability to live on earth (Mayerl & Best, 2019). Environmental problems are increasingly impacting people from all over the world in an adverse way (Osunji, 2021). Most major environmental issues have been changing the course of life on Earth and are attributed to the rapid changes that took place during industrialisation (Al-Masri et al., 2023). Air pollution, water toxicity and waste, amongst others, are alarming concerns that endanger the future of humanity. The rapid rate at which these issues are increasing requires humans to become more conscious of their existence and the ways in which they impact the environment (Al-Masri et al., 2023).

Therefore, there is a need to examine the global reach of various environmental problems since there has been an ever-increasing global awareness of such problems (Dunlap et al., 2000). Environmental problems are ubiquitous because socioeconomic forces have caused environmental problems (Dunlap et al., 2000). Environmental problems also manifest in different ways. Examples include global warming, pollution, deforestation, and the greenhouse emissions, which are all detrimental to the environment itself and to the health of humans. Humankind is, directly and indirectly, facing several environmental problems that have been caused by the misuse of the environment and the lack of environmental consciousness of

society. Environmental consciousness is the result of the interaction between society, education, family, and harmonious living with the environment (Özmen & Karamustafaoğlu, 2006; Jadhav et al., 2014; Calitz et al., 2020). Environmental problems can be divided into natural and artificial types. The most serious artificial environmental problems that reoccur are deforestation, pollution, and the depletion of the ozone layer. It is safe to say that the environment has become bedevilled by such problems as a result of inadequate environmental awareness, skills, and knowledge (Osunji, 2021).

One of the first warnings of the potential dangers of chemical pesticides came from *Silent Spring* (1962), in which Rachel Carson spoke about the dangerous effects of pesticide use and the responsibility of science to mitigate these dangers (Lear, 1993). The book represented a form of social revolution since it was written during a time of new affluence and intense social conformity; the Cold War was at its zenith, and the chemical industry was one of the main beneficiaries of postwar technology. Carson's writing aimed to transform the relationship between humans and the environment and awaken the public's environmental consciousness (Lear, 1993). *Silent Spring* emanated from Carson's work as a marine biologist, and her observations remain applicable today, especially her concerns about the loss of biodiversity. For instance, in the book, she noted that nature introduced great variety into the landscape, but man has displayed a passion for simplifying it, by undoing nature's built-in checks and balances (Lear, 1993). Simply put, this statement illustrates how Carson was confronting the destruction of nature by humans. The year 2022 marked the 60th anniversary of the book's publication, which inspired the formation of the environmental protection movement and scientific disquiet about climate change (Massey, 2021).

Carson's work triggered an era of environmental awareness which sought to address contemporary environmental problems, especially climate change, which has continued to become a dire crisis. Carson's work is still a valuable source which provides insight into how to create and enhance people's awareness of environmental problems (Meyer, 2021). Even though *Silent Spring* mainly focuses on the use of chemicals and pesticides, readers and researchers have derived broader insights into how humans interact with and misuse the environment. Essentially, research such as *Silent Spring* is part of the historical footprint for future generations and societies to better understand how everything came to be (Meyer, 2021).

The world today faces highly complicated environmental issues because of relentless industrialisation that is causing environmental problems such as global warming, climate change, natural resource depletion, and water contamination, to mention but a few (Mayerl &

Best, 2019). It has been argued multiple times that many environmental issues are the result of humans' endeavours for continuous development and global urbanisation (Wang & Dong, 2019). This desire for continuous development has resulted in environmental degradation, which covers an array of environmental issues such as the loss of biodiversity, pollution, and deforestation. Environmental degradation refers to the deterioration of the environment as resources (water, plants, animals) start to become depleted (Maurya et al., 2020). This depletion then causes disturbances and alterations to how the environment functions.

According to Bently (2022), there are three types of environmental degradation. Firstly, soil and land are degraded. This degradation is the result of poor farming methods and the use of pesticides that affect the quality of the soil. Secondly, there is the degradation of water, which includes the dumping of waste in seas, the dumping of industrial waste in areas surrounding rivers, and illegal dumping. Thirdly, atmospheric degradation refers to the thinning of the ozone layer and air pollution. In addition to these three forms of degradation, there are also several other kinds of pollution, such as noise pollution (Bentley, 2022). Since the Industrial Revolution, the world has seen significant population growth, economic growth, and urbanisation, all at the cost of the environment, resulting in significant environmental degradation (Sart, 2022). Humans face poor environmental conditions because of industrialisation and urbanisation. Thus, economic growth, social inclusion, and environmental protection are three dimensions that need to be achieved for sustainable development and the reversal of the negative effects of environmental problems (Sart, 2022).

2.4.1 The drivers of environmental change

Environmental change has been caused by a myriad of pressures and demands on the environment (Maurya et al., 2020). Environmental change is also caused by human activity and has become a serious problem worldwide (Mayerl & Best, 2019). There are numerous causes and drivers of environmental change that stem from human activities. These drivers include social, economic, environmental, political, and administrative factors that all contribute to environmental degradation (Bentley, 2022). The first social factor that causes environmental change is population growth because as populations increase, more natural resources are consumed. This increased consumption further exposes the environment to a loss of biodiversity, pollution, and increased demand for land (urbanisation). Urbanisation leads to increasing numbers of people moving to cities due to a lack of productive employment opportunities in rural areas (Bentley, 2022).

Some of the economic factors that cause environmental change include economic development, market failures, transport activities, and agricultural development (loosely regulated agricultural market resulting in challenges to reduce poverty). These factors will now be discussed in turn. The impact of economic development on nature and the environment is because of industrialised-based economic development. One example of such a development is the mining industry, where some mines, for centuries, have remained unrehabilitated, abandoned, and defunct. Such abandoned mines can significantly contribute to environmental problems. What exacerbates the impact of economic factors on the environment in South Africa is the historical legacy of apartheid despite the new economic dispensation in the country (Stewart & Zaaiman, 2015). Market failures also contribute to environmental changes when there is an absence of environmental goods and services and when human demands are not met. Transportation, too, operates in a manner that affects the environment; it causes noise pollution from traffic and air pollution. Marine transportation can also result in oil spills. Agricultural developments cause soil erosion and nutrient loss due to intensive agricultural activity and irrigation (Bentley, 2022).

Other factors also play a role in negatively impacting the environment. Political and administrative factors can cause environmental degradation when there are no visionary leaders, policymakers, and politicians to apply environmental law. Bad policies can also lead to environmental problems. Negative long-term environmental effects are also impacted by various environmental factors, such as habitat fragmentation, which has the potential to completely destroy all ecosystems because of development. For instance, roads can be built and may cut through forests; water contamination and the continued destruction of the ozone layer will continue due to air and water pollution. Consequently, environmental change and degradation have a significantly negative impact on human health. Environmental issues threaten the health and well-being of humans. These issues affect everyone to some degree, although not everyone is equally guilty of creating environmental problems, considering the biosphere also has powerful and destructive forces such as floods, tornados, and hurricanes. Other effects of environmental change are water shortages and a reduction in the quality of food and water, which have all caused deaths and illnesses. Furthermore, the effects of environmental changes can result in atmospheric changes, which are changes to natural processes such as the water cycle and the functional routine of animals and plants.

Environmental issues, these days, have become a grave concern as many environmental crises pose a risk to human health and have dire consequences for vulnerable people (Al-Masri et al.,

2023). People need to be aware of the different types of environmental issues, such as natural disasters, changing weather patterns, and tremendous floods. The drivers of environmental change include the expansion of the human population, pollution, water scarcity, food shortages, and the loss of biodiversity. In essence, pollution, water scarcity and the loss of biodiversity are various types of environmental problems. Many environmental problems are caused by economic growth that, in turn, leads to pollution. Overconsumption also leads to water scarcity, while the high usage of transportation and energy and the overproduction of industrial waste all result in pollution (Al-Masri et al., 2023).

The destruction and contamination of the natural environment have mostly been attributed to rapid population growth, technological advances, and industrialisation. This is an indication that when natural resources are unconsciously consumed, the environment and all creatures that exist in the natural environment are negatively affected. The growth in diseases, too, can be attributed to human activity and increased exposure to chemicals that have adverse effects on health. For instance, asthma, kidney diseases, congenital disabilities, and nervous system disorders have been classified as diseases caused by the surrounding environment. Similarly, there are environmental problems such as drought, extensive flooding, and the overconsumption of energy that result in environmental degradation (Uthamaputhran et al., 2020).

Malaysia is one example of a context in which school children are suffering due to the effects of climate change, which is the result of unethical human behaviour and the illegal dumping of hazardous chemical waste into rivers. This has caused health problems which included vomiting, nausea, and breathing difficulties among school children. About 2000 people have been affected; 143 were hospitalised, and 111 schools were ordered to close (Uthamaputhran et al., 2020). Unfortunately, most of the areas in Malaysia have recorded unhealthy levels on the Air Pollution Index (API) of 201 to 300. This illustrates the correlation between irresponsible human behaviour and ecological degradation (Uthamaputhran et al., 2020).

Environmental degradation due to over-exploited natural resources, pollution, and deforestation is yet another example of how changes to the environment can cause a shortage of resources (Bentley, 2022). Indeed, environmental degradation is arguably the most significant concern for humans and sustainability globally (Beukes, 2021). Environmental degradation is a serious global problem that encompasses a variety of environmental issues such as loss of biodiversity, pollution, global warming, deforestation, and animal extinction. It is the deterioration of the environment as resources, including all biotic and abiotic resources,

are depleted. The biotic resources (animals, birds, plants and fish) and abiotic resources (air, water, soil and other non-living organisms) form our surroundings planet Earth (Maurya et al., 2020). Clearly, then, civilisation is being reshaped by changes in the natural environment.

Africa, for instance, is one of the first continents to feel the effects of climate change due to deforestation. The effects of pollution, primarily caused by countries with large industrial complexes, endanger the African continent and have a negative impact on Africa's environmental status. This is the result of the relationship between capitalism, pollution, and consumerism, which all play a devasting role in continuously damaging the environment and negatively affecting ecosystems. Therefore, the global consequences of the ecological crisis cannot be overlooked. And if the global ecological crisis is not given attention, young people and children will be affected. Therefore, people need to start paying attention to the environment. Environmental awareness is important for health and for future generations.

This research agrees with the sentiments expressed above; being concerned about the environment will help people live sustainably (Synodinos, 2019). Environmental changes require urgent attention, especially those that contribute to the acceleration of environmental degradation. The drivers of environmental change and degradation are interrelated and include issues such as climate change, soil degradation, the depletion of resources, and the loss of biodiversity.

The major contributing factor to environmental degradation is human activity, which comprises modern industrialisation, urbanisation, deforestation, and overpopulation, as well as natural factors (droughts, rising temperatures, fires, and floods). Automobile industries, for instance, contribute to air pollution because of the increased amount of poisonous gases, such as smoke, sulfur oxides (SOx), and nitrogen oxides (NOx), that are released into the atmosphere. These toxic gases, when mixed into the atmosphere, can cause acid rain and carbon monoxide (CO) (Maurya et al., 2020). Vehicles also emit smoke and other dust particles that pollute the air. Figure 2.1 below illustrates the different causes of environmental degradation.

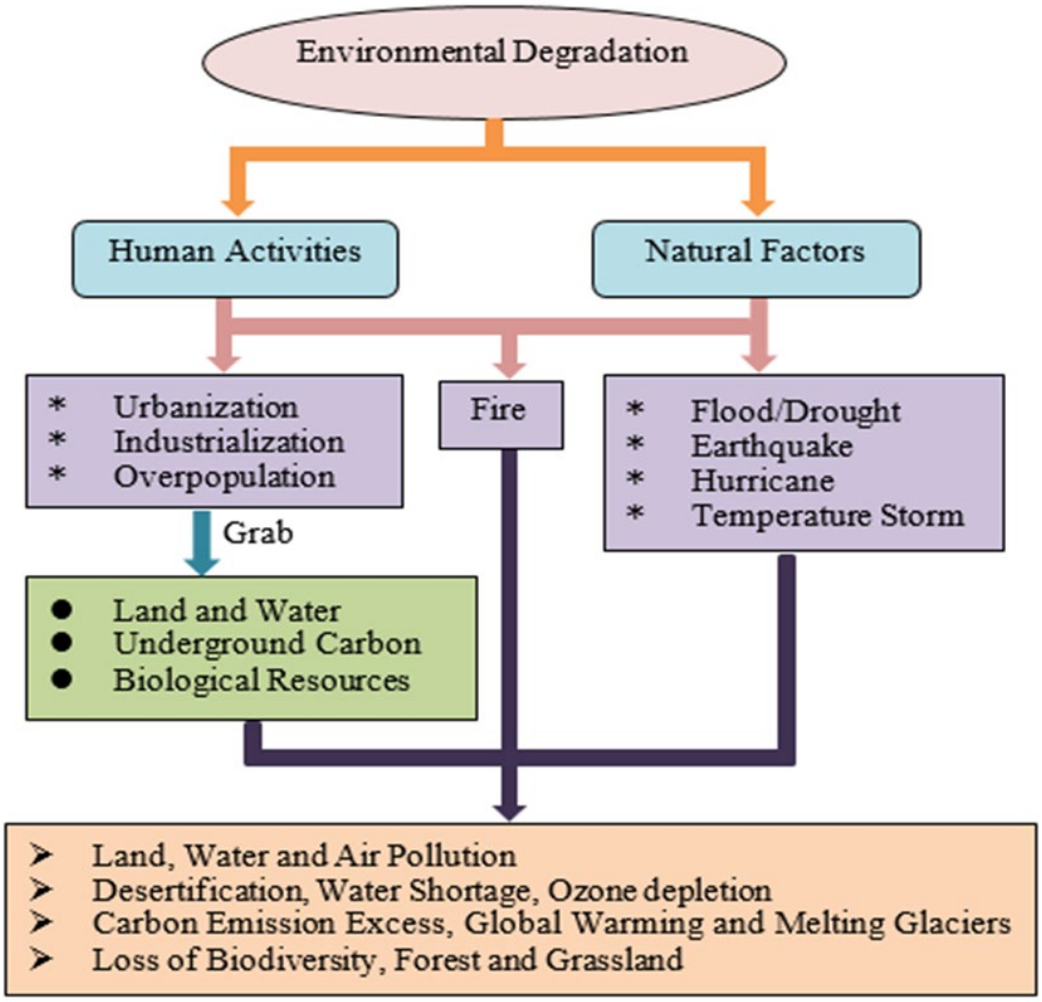


Figure 2.1 Illustration of the different causes of environmental degradation

Source: Maurya et al., 2020

The chapter now turns to a discussion of how broader environmental problems have been classified.

2.4.1.1 Pollution

Globally, pollution is a serious problem and a direct result of the deterioration of the quality of the environment (including both biotic and abiotic factors). The release of harmful contaminants like toxic gases, biological molecules, and chemicals into the atmosphere causes air pollution. The contaminants are detrimental to humans and pose great health risks. In developing countries, water pollution is the biggest problem. About 71% of the earth's total groundwater and surface is covered by water. Water is an in-demand resource in both urban

and rural communities. Humans cannot live without water, and it is the habitat of all marine and freshwater organisms. Generally, water pollution is caused by humans as a result of their daily activities (Maurya et al., 2020).

Air pollution is caused by the chemicals present in the air at levels that are not considered safe for the health of humans (Tshehla & Wright, 2019). According to the World Health Organisation (WHO), air pollution is regarded as one of the greatest environmental threats to human health; it can lead to morbidity and mortality. Air pollution can result in acid rain which is formed primarily by sulfur oxides and nitrogen oxides in the atmosphere. These toxic gases are pollutants that have negative effects on the health of humans. Acid rain results in the acidification of water bodies and soil, which also poses a threat to food security (Tshehla & Wright, 2019).

Recently, the living environment has been polluted at an alarming rate because of humans' lack of environmental consciousness (Pham & Nguyen, 2022). Environmental pollution continues to worsen. For instance, Vietnam has frequently been experiencing the greenhouse phenomenon, with the concentration of dust always being 2-3 times higher than the permittable standard (Pham & Nguyen, 2022). This dust is from factories in and around the cities, cars, and the unconscious discharges of businesses and people. This greenhouse effect is compounded by other environmental problems, such as noise pollution, water pollution, and sewage sludge. All of these have resulted in an increase in diseases relating to the environment (Pham & Nguyen, 2022).

In South Africa, there are eleven large coal-fired power stations that produce atmospheric emissions, all of which are accompanied by ash disposals from the backbone of South Africa's energy supply. What feeds the power stations are the various coal mines with crushing, blasting, and drilling facilities, as well as long, unpaved haul roads. In a year, more than 140 million tonnes of coal is supplied to key energy hubs by mines (Masekoameng et al., 2021). There are also abandoned mines where coal waste is discarded. Mines near Emalahleni and Middelburg in Mpumalanga also have become home to ferrochrome smelters. About 15 million people live in the surrounding areas in small towns, densely populated low-income settlements, urban centres, and farmsteads. The people who live in low-income areas and informal settlements generally live in poor socio-economic circumstances; unemployment and high levels of crime are also rife (Masekoameng et al., 2021). Exacerbating the poor living conditions is the absence of waste collection services, which compels people to burn their waste, usually in close

proximity to the informal settlements. Furthermore, the people in these areas may make use of low-quality coal despite having electricity connections.

Beyond these dire socioeconomic circumstances, however, there is the quintessential feature of atmosphere stability. The anticyclone creates a stable atmosphere in both summer and winter. However, the same anticyclone also prevents the inward flow of moist air, which affects the air quality. It is, therefore, unsurprising that the people who live in low-income areas and informal settlements are prone to experiencing respiratory diseases, such as asthma, at abnormal rates (Masekoameng et al., 2021). The real tragedy, however, is that conditions remain unchanged despite government efforts to try regulate air quality (Masekoameng et al., 2021). Some of the local efforts include the transition from the *Atmospheric Pollution Prevention Act (APPA) Number 45 of 1965*, which focused on emitters of air pollution, to the *National Environmental Management Air Quality Act (NEMAQA) No. 39 of 2004*, to reduce air pollution emissions and monitor the effects of air pollution on the environment (Tshehla & Wright, 2019). However, environmental problems associated with air pollution in South Africa are nowhere close to being solved. It has been over 15 years since the *Air Quality Act (AQA)* was passed, and yet it is evident that some of the strategic objectives have still not been met (Tshehla & Wright, 2019). The researcher hypothesises that the reason could be due to a gap between science and policy. To resolve the issue, sound policy implementation is required, along with the effective management of air quality in the country.

2.4.1.2 Depletion of resources

In the 21st century, the well-being of humans is a top priority for all nations (Ahmad et al., 2023). However, the depletion of natural resources has a negative impact on human well-being. Over the years, the economies of many countries have improved using natural resources to meet citizens' needs since natural resources have a positive impact on human development. However, natural resources become depleted when they are used more than they are replenished as a result of pollution and overconsumption (Pelser, 2012). Human activities such as the burning of biomass and the combustion of fossil fuels generate greenhouse gases. As a result of this, the depletion of natural resources is faster than the rate at which these resources can be replenished.

The various types of natural resource depletion that can occur include deforestation, the burning of fossil fuel by mines, slash-and-burn agricultural practices, soil erosion, the use of energy reserves such as gas and oil, and unnecessary use of natural resources. The depletion of

resources is considered a major contributor to global warming (Ali et al., 2021). Although the abundant supply of natural resources has assisted economies to grow rapidly, it has also resulted in the depletion of finite natural resources and has caused ecological crises. Consequently, the unchecked and continuous depletion of resources causes significant challenges to all living things (Ahmad et al., 2023).

2.4.1.3 Loss of biodiversity

The United Nations Convention on Biological Diversity formally defined biodiversity as the variability of living organisms or life on Earth and it includes from all sources, including marine ecosystems and the ecological complexes they are part of. Furthermore, diversity includes species within and species between ecosystems (Roe, 2019). The key term in defining biodiversity is variability, which essentially refers to the diversity of life (living organisms), species, ecosystems, cultural diversities and the ecological interactions between species and the processes that support the diverse forms of life (Roe, 2019). Deforestation is an example phenomenon that is considered a major contributor to the loss of biodiversity (Ali et al., 2021).

Population growth, climate change, pollution, and unsustainable consumption patterns all contribute to the loss of animals and plants. Biodiversity is the mainstay of agricultural crops; the loss of biodiversity has serious implications for future developments (Pelser, 2012). The loss of diversity also affects the interests of humans beyond their desire for nature conservation. Human health depends greatly on the products provided by plants and animals. Some pharmaceutical products and medicines are extracted from the tissues of plants and animals (Pelser, 2012).

A loss of biodiversity is as equally impactful on society as climate change is. However, there is a lack of information about biodiversity loss and the importance of protecting biodiversity in current debates about climate change (Roe, 2019) since climate change is a high priority on the agenda. When biodiversity loss is reported in the media, it is done in a manner that provokes emotional reactions to the plight of animals such as polar bears, elephants, and rhinos. Indeed, neither developmental organisations nor individuals seem to be concerned about biodiversity loss as they do not see the connection between its decline and their developmental agenda to alleviate poverty and improve healthcare. However, biodiversity matters. It is essential for the development of natural systems and a reduction in poverty (Roe, 2019). Moreover, it has a significant effect on the productivity and stability of natural ecosystems and the services they provide. Many of which are required for key developments (Roe, 2019).

Biodiversity is more than just the wealth of diversity in nature. It is also about the health of nature. Therefore, a loss of biodiversity undermines the ability of ecosystems to effectively support the health of the environment. Crucially, biodiversity underpins the extent, abundance, and condition of the environment for people now and in the future, especially when they are faced with changes in environmental conditions (Roe, 2019).

2.4.1.4 Land degradation

Land degradation can occur naturally or through man-made activities that lead to soil degradation (Maurya et al., 2020). Land conditions are negatively affected by land degradation caused by direct and indirect human-induced activities. Example activities include anthropogenic climate change, which leads to long-term loss of biological productivity and a negative impact on the ecological integrity of humans. Globally, land degradation affects 3.2 billion people. It impacts biodiversity and ecosystems and amounts to more than 10% of annual gross domestic product (GDP) worldwide. Essentially, land degradation is a problem that negatively impacts biodiversity, society, and people's livelihoods. It impedes the progress of achieving sustainable development goals (SDGs) and of overcoming climate-related problems. According to the Food and Agriculture Organization of the United Nations and Intergovernmental Technical Panel on Soils (2015), about 25% of the land area on Earth is said to be already degraded or currently degrading, which has adverse effects on people's livelihoods. Degradation affects between 1.3 – 3.2 billion people living in poverty in developing countries.

Globally, there has been rapid change in the Amazon basin. Currently, it covers about 7% of the surface on Earth and about 40% of the South American continent. It is a home to approximately 38 million people, and it is considered as one of the most biodiverse regions on Planet Earth. Seventy per cent of the Amazon resides in Brazil, even though it is shared between 9 countries (Colombia, French Guiana, Guyana, Peru, Brazil, Bolivia, Suriname, and Venezuela). The Amazon basin plays a critical role of regulating the local and regional weather patterns and it also acts as a buffer against climate change (Castro et al., 2019). Interestingly, it contains the largest and most diverse tropical rainforests globally, with unexplored sources and a vast amount of natural resources.

However, the resource-filled natural environment contrasts vastly with the living conditions of the Brazilian Amazonians. Their living conditions are characterised by the burden of highly infectious diseases. For instance, there are about 99% of malaria cases in the country, and the

life expectancy is lower than that of the more developed Southeast region by 5 years. Population and economic booms in the Brazilian Amazon are driven by continuous cycles of resource exploitation.

Land degradation in South Africa is a unique and significant issue due to its history of inequality and the limited access to land and natural resources placed on certain populations. Nearly 60% of the land in South Africa has degraded, and about 91% of the land is prone to desertification (Mani et al., 2021). Land governance in South Africa has been shaped by patterned distributions of societal resources (Mani et al., 2021). There are interrelated factors that drive land degradation, including institutional and biophysical factors (Mani et al., 2021). The biophysical factors are climate change and the availability of water, which determine land use. Institutional factors refer to economic factors, the governance of land use, and the management of it.

2.5 The human-environment interaction

Globally, there is a consensus that the natural environment is irretrievably interrelated with the state of the human population (Pelser, 2012). Indeed, as human surroundings keep changing, so too does the environment (Al-Masri et al., 2023). In other words, the state of the environment and human health are interlinked since the quality of life depends on the quality of the environment. Environmental conditions play a role in determining the health of people and their life expectancy. Yet the opposite is true, too. Social elements impact the natural environment; human activities continually change the biophysical makeup of the environment and the conditions surrounding humans. As a result of this two-way relationship, humans have been witnessing rapid changes in the natural environment propelled by overconsumption (Pelser, 2012).

The relationship between human populations and the environment is complex and multifaceted. It is not a straightforward relationship since several variables come into play, including for example, defective markets, inefficient economies, and faulty policies (Stewart & Zaaiman, 2015). Various competing and contradictory views about the relationship between humans and the environment influence how humans perceive the environment. On the one hand, there is the old, dominant view of the human-nature relationship, which sees powerful human agents dictating how humans and nature interact by protecting the environment and removing humans' rights to natural resources and land. On the other hand, there is the economic view of the human-nature relationship, which sees the environment as an economic asset that enables

socio-economic development. The economic view argues that exploiting the environment will lift people out of poverty. However, both these views are limiting as they advocate for anthropocentrism (Stewart & Zaaiman, 2015). The complex relationship between humans and the environment involves the population, environment, and development (PED) nexus, which is the interface between the human population, the environment, and development. The PED nexus represents the reciprocal and complex relationships between population, environment, and economic development factors in everyday life (Pelser & Redelinghuys, 2008). It is embedded in the formula I=PAT, wherein I = Impact (on the environment), P =Population, A= Affluence (the level of consumption), and T= Technology. In this formula, population refers to the total number of people in terms of their distribution and density. Consumption refers to the amount of resources that people consume (affluence), and technology refers to how resources are used and how much waste is produced. The formula illustrates how the three components of environmental impact – population, consumption, and technology – do not work in isolation. Their cumulative interaction determines the extent of human impact on the environment (Pelser & Redelinghuys, 2008). Even though population growth can cause environmental problems, for example, environmental problems can, in turn, increase population growth due to resource depletion in certain areas, as societies depend on natural resources such as soil, water, and forests (Myers, 1998).

The first component of the PED nexus, population, is the social reality that humans change over time in terms of demographic size due to the processes of fertility, migration, and mortality. Development, the third component of the PED nexus, involves economic activities in which people participate in the environment. These economic activities help to improve their quality of life. However, it has been observed that several cities are unsustainable due to the environmental pressure caused by industrial development, technological advancements, and increasing populations. Human societies are also impacted by powerful political and economic forces that can overpower individuals (Cylke, 1993; Asilsoy, 2012). All these issues have led to a new way of thinking about the environment, which has been termed “sustainability”. To enhance the thinking behind sustainability, individuals need to raise their environmental consciousness, and this will require a change in people's everyday practices (Asilsoy, 2012).

Technological developments also contribute to the destruction of the environment (Myers, 1998). Essentially, the interrelationship between population, environment, and development (PED) needs to be explored in order to better understand the functions of the PED nexus. These three factors are constantly and dynamically interacting and also mutually impact one another

(Pelser & Redelinghuys, 2008). Simply put, human impact on the environment is compounded by population, consumption, and technology. The population variable, however, entails more than just the size of a population. It encapsulates all the processes linked to size, such as age structure, composition, deaths, and migration, to mention but a few. Any one or more of the three variables – population, consumption, and technology – can interact with and impact the environment at any stage. Furthermore, the conception of the PED nexus encapsulates the "triple bottom line" principle, which means that developmental initiatives should include social and environmental factors in addition to economic advancements (Pelser, 2010). Figure 2.2 below illustrates the abovementioned PED nexus linkages.

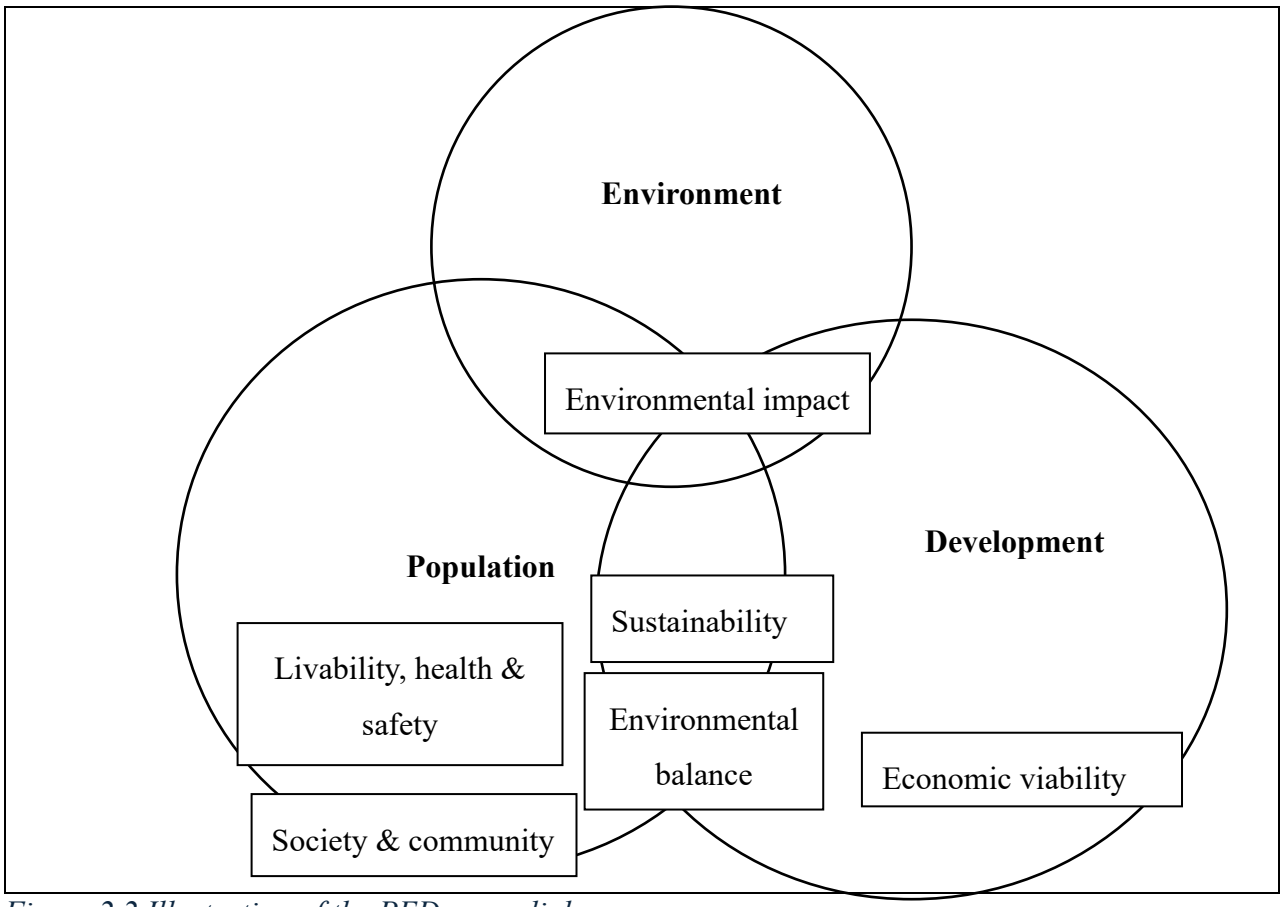


Figure 2.2 Illustration of the PED nexus linkages

Source: own compilation

The PED nexus has been developed to illustrate the multiple and reciprocal relationships that exist among the three factors (population, environment and development) (Van Wyk, 2021; Pelser 2010). Simply put, population (in the form of size, composition, fertility or migration) is interlinked with development (activities in the environment that improve the quality of life and economic growth) and the environment (climate change, loss of species and the degradation of the environment). The vulnerability of the population and environment means that they can influence each other either negatively or positively depending on developmental activities (for instance loss of biodiversity has serious implications on human well-being). Therefore, sustainable development is vital; it will assist in reducing the negative impact of development on the environment. Moreover, a sustainable society is essential for the environment so that future generations can derive the same benefits from the life support systems the environment provides to humans (Pelser, 2010).

In addition to using the PED nexus to understand the human-nature relationship, it is essential to take a multidimensional approach to allow for a more nuanced understanding of this relationship. It is interesting to see how different social and cultural groups view the

environment. It is also interesting to observe how cultural differences relate or connect to nature. Essentially, socio-economic factors should be considered in the human-nature relationship since socio-economic factors, include the distribution of income, the availability of social services, and the quality of life. A holistic understanding of the human-nature relationship can assist in reconciling economic development and the preservation of the environment to promote pro-environmental behaviour (Amerigo, 2017).

Yet, environmental resources are disproportionately accessible to certain groups of people. Similarly, environmental threats impact certain groups more than others due to uneven levels of human development. The negative impact of environmental crises is worsened by human activities, which continue to cause irreparable damage to the environment's functionality by disrupting the processes of natural systems. This disruption, in turn, makes societies more vulnerable to the effects of environmental changes. Nonetheless, sustainable development may be able to solve looming environmental threats (Stewart & Zaaiman, 2015). Although sustainable development is a buzzword when it comes to addressing environmental issues, it remains a great challenge in recent times, despite the intention of people to foster a new relationship with the environment. The great challenge with sustainable development is that there is a lack of consensus on what it stands for and varying degrees to which countries invest in it (Stewart & Zaaimaan, 2015).

It is essential to explore peoples' environmental values when weighing up environmental dilemmas against people's economic needs. For instance, there is an inseparable relationship between poverty and environmental degradation, mainly in developing countries (De Wet-Billings, 2022). Poverty refers to inadequate access to the amenities that are necessary for a person's survival, for example, food, good health, employment, and other basic social services (De Wet-Billings, 2022). As a result, poverty breeds helplessness, depression, and frustration. It also means that people struggle to get access to items that are necessary for basic survival, often at the expense of the environment in the long term. Fundamentally, the environment is important for the existence and development of all living things and human beings. Moreover, it is equally important for countries' economic growth and social and cultural development. Therefore, everyone (individuals, the whole of humanity) is responsible for protecting the living environment. This goal can be assisted by understanding humans' attitudes towards the environment (Pham & Nguyen, 2022).

2.6 Conceptualisation and dimensions of environmental consciousness

The phenomenon of environmental consciousness essentially rose as environmental problems started to increase rapidly. It determines people's knowledge about the environment and how knowledgeable they are about their impact on the environment. Essentially, it is a multifaceted concept that determines people's behaviour based on psychological factors, socio-demographic factors, and attitudes. The researcher has observed that environmental consciousness specifically focuses on knowledge and people's understanding of the environment, its problems, and processes (the functions of the environment).

Environmental consciousness (EC) is a complex phenomenon with various definitions. The term essentially came into being when environmental problems started increasing rapidly (Pham Nguyen, 2022). Historically, Krause (1993) defined environmental consciousness as a phenomenon that focuses on psychological factors relating to the tendencies of humans to engage in pro-environmental behaviour. However, the term encompasses several aspects, and it has been defined in various ways that focus on the intrinsic factors of individuals (Kim & Lee, 2023). Kollmuss and Agyeman (2002), for example, defined environmental consciousness as the level of knowledge individuals have about the impact of human actions on the environment. Ahmed (1998) defined environmental consciousness as the perception that individuals or organisations have about environmental concepts such as environmental management, environmental protection, environmental policy, and environmentalism. Environmental consciousness is also defined as the willingness of people to become aware of environmental problems and to have an interest in environmental problems (Kim & Lee, 2023). Environmental consciousness refers to the propensity of individuals to participate in pro-environmental behaviour based on psychological factors (Kim & Lee, 2023). Being environmentally conscious refers to an individual's ability to understand the nature of environmental processes and problems (Yeung, 1998), and it is a term that broadly describes behaviours for reducing and minimising environmental harm (Akkor and Gündüz, 2017). Although there are slight variations in how 'environmental consciousness' is defined, most definitions include an awareness of environmental problems.

The definition of environmental consciousness used in this study states that it relates to the behaviour, attitudes, and thoughts of an individual or community that aim to balance the interaction between humans and the environment. This understanding of environmental consciousness includes how knowledgeable or aware people are of environmental problems. Essentially, environmental consciousness serves the purpose of providing future generations

with a safer and healthier environment. Therefore, it is essential to understand people's level of environmental consciousness and whether they know about the issues that affect the environment, especially the direct and indirect changes that fundamentally affect all creatures that exist within the environment (Pham & Nguyen, 2022).

Environmental consciousness consists of the psychological factors that determine people's propensity towards pro-environmental behaviour. (Ikiriko, Anthony & Dawaye, 2023). Given that environmental consciousness has multidimensional aspects, it can be viewed with affective and cognitive facets. The affective facet refers to the emotional connections and sentiments individuals harbour. Within the affective facet, there is environmental concern, and it embodies feelings, emotions and sentiments individuals hold toward the environment (Laheri et al., 2024). It captures how individuals' emotional connection to environmental well-being and the reactions they have when confronted by environmental issues. When individuals have environmental concerns, it serves as an emotional catalyst that can trigger them into action influenced by their attitudes and eventual behaviours (Laheri et al., 2024).

On the other hand, the cognitive facet refers to individuals' understanding of things. The cognitive facet is embodied in environmental knowledge. Knowledge involves the acquisition and assimilation of information. Environmental knowledge relates to an individual's understanding of environmental issues, causes and consequences, and solutions. Furthermore, environmental knowledge serves as a framework within which individuals make sense of environmental information, which in turn, informs their perceptions and beliefs (Laheri et al., 2024).

Environmental knowledge refers to an individual's perception of how far the individual knows about environmental issues in general (Qomariah & Prabawani, 2020). For instance, the individual may have general knowledge about air pollution, global warming, water pollution, and the causes of animal extinction. Furthermore, environmental knowledge refers to knowledge about energy sources and the impact they have on health, the economy and environment. Moreover, it also includes knowledge about environmental issues, knowledge on environmental problems, energy issues and water quality known at an individual level. It also refers to knowledge about specific environmental topics such as soil pollution and micro-plastic hazards (Qomariah & Prabawani, 2020).

Environmental concern is defined as the psychological response to the environment by individuals (Qomariah & Prabawani, 2020). Moreover, it is the willingness of individuals to

support efforts to address environmental problems or personally contribute to solutions (Kim & Lee, 2023). It is one of the environmental attitude aspects that refers to the effects that correlate with beliefs about environmental concerns and can be divided into three categories: egoistic as a selfish attitude, altruistic as an attitude of care to others and biospheric as an attitude of care to the biosphere life.

Holistically, the two facets provide an understanding of how individuals feel, perceive and process information that shapes their attitudes and behaviour towards the environment. A blend of the affective and cognitive facets presents environmental values. Such values are ingrained in individuals' beliefs they hold about the environment. They serve as guiding principles in life forged by a combination of emotions and informed understandings. Environmental values act as a bridge between environmental knowledge and environmental concern. The two indicate what individuals know and feel about the environment. Therefore, there are three essential factors that determine environmental consciousness: environmental knowledge, environmental concern, and environmental values.

Environmental consciousness has considerably increased globally (Ndum et al., 2022). Despite the global increase in environmental awareness, it remains understudied in developing countries, especially the psychological factors that affect environmentally responsible behaviour. Recent research about environmental consciousness indicates that there is a gap that exists between people's actions and attitudes. Environmental consciousness is not reflected in people's daily lives. Furthermore, research that focuses on the motivation to destroy the natural environment or show pro-environmental behaviours is also understudied. Instead, most research has focused on investigating the psychological factors that influence people's values, behaviours, attitudes, norms, and sense of control.

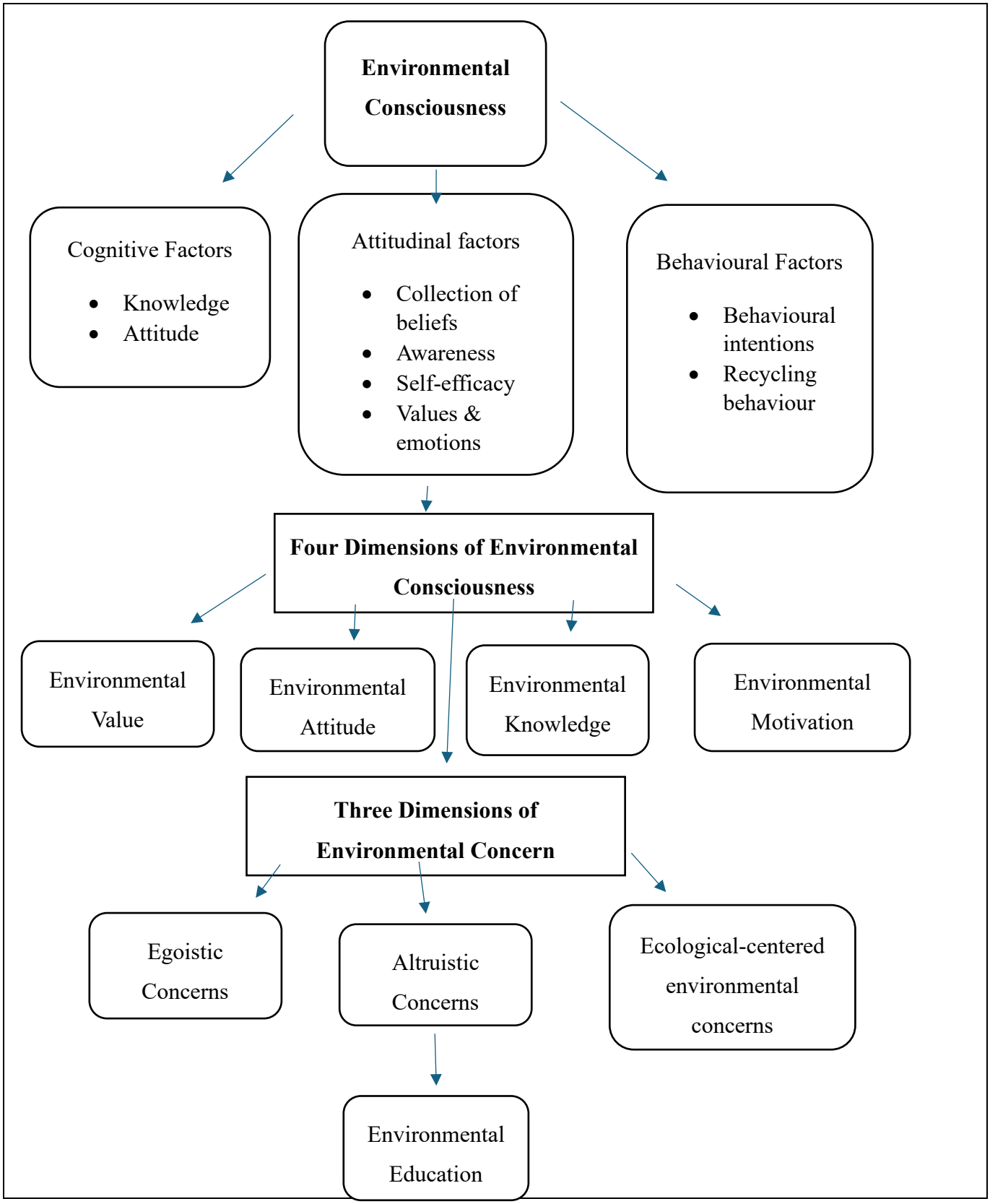
Environmental consciousness involves specific knowledge of how nature is treated. Such consciousness also involves evaluating how nature is treated. Environmental consciousness also has an emotional and behavioural dimension. In other words, to be environmentally conscious means to be thoughtful and decisive about issues related to the environment (Akkor and Gündüz, 2017). Similarly, it creates an appropriate emotional background and testifies to the levels of people's environmental concern (Shedlovska, 2013).

Environmental consciousness has four dimensions including environmental attitude, knowledge, value, and motivation (Kim & Lee, 2023). Environmental knowledge refers to people's general knowledge of the relationship between humans and the environment. This

knowledge includes facts about the natural environment and major ecosystems. Furthermore, it includes what people know about the environment and what environmental relationships exist. There are three key aspects of environmental knowledge. Firstly, environmental knowledge includes the ideas and concepts that individuals have about the environment, the interrelations of humans and nature, as well as the results of these relations (Shedlovska, 2013). Secondly, there is an affective component to knowledge, which refers to the personal subjective evaluation of individuals and emotions arising in the system of relations between humans and the environment. This component can measure emotional background. Thirdly, the active component of knowledge shows the readiness of society for action (Shedlovska, 2013). These three components of knowledge are also the structural elements of environmental consciousness as they are influenced by the values of individuals. Therefore, environmental consciousness includes knowledge of the correlation between humans and the environment (Shedlovska, 2013). Being environmentally conscious is an ongoing learning process. Thus, people need to educate themselves about the environment and how human behaviour negatively affects the Earth (Yeung, 1998). Environmental knowledge in the context of this study looked at what students know about the environment and the relationship between people and the environment. To understand the many facets of environmental consciousness, the researcher developed a conceptual framework of environmental consciousness to visualise the dimensions of it.

Figure 2.3 Conceptual framework of Environmental Consciousness and its dimensions

Source: Own compilation



As shown above, environmental consciousness is regarded as a multidimensional structure composed of three factors: cognitive, attitudinal, and behavioural. Furthermore, it is divided into four categories: environmental value, attitude, knowledge, and motivation. Environmental consciousness refers to the specific psychological factor that is directly related to an individual's propensity to participate in eco-friendly behaviour (Kim & Lee, 2023). It refers to the willingness of an individual to become aware of environmental problems and support efforts to solve environmental problems. Moreover, the concept of environmental consciousness mainly includes the awareness of environmental problems, attitudes, and opinions on environmental problems.

Overall, environmental knowledge is key to addressing social and environmental problems (Kim & Lee, 2023). Planet Earth is the only home for humanity, and it is being seriously threatened by climate change and environmental degradation. However, this threat can be mitigated by stressing the point that the environment is a shared space, and it needs to be looked after. Many young people, however, have little recognition of the links between environmental issues, responsibility, and action. In fact, research has shown that some students possess a limited range of positive environmental attitudes (Yeung, 1998; De Wet-Billings, 2022). An awareness of the interconnectedness between humans and nature warrants a departure from the cause-and-effect thinking model to a holistic way of thinking that will allow for the integration of new ways of thinking (Wilks & Harris, 2016). Social sciences, in reality, need to become more deeply engaged in understanding the human dimension of global environmental change and come up with possible responses to climate change. Scientific knowledge no longer needs to be objective as social processes occur when people form attitudes towards environmental issues, especially when society prioritises social issues (Smith, Kim & Son, 2017).

Some studies, for example, have found that environmental perceptions depend on people's socioeconomic status, demographics, and cultural contexts (Kirsten & Biyase, 2023). The findings of some of these studies show that there is much variety in the ways that people perceive the environment. For instance, a study by Gray et al. (2019) stated that being concerned about the environment can be directly linked to how educated people are. The assumption is that educated people have a higher disposable income; therefore, they are more likely to engage in pro-environmental behaviour.

However, literature on the environmental perceptions of various social groups is underrepresented. This underrepresentation is likely due to differences in environmental

degradation and environmental awareness globally. South Africa, for instance, is a country regarded worldwide as an unequal society, and little is known about the varying environmental perceptions and behaviours of South Africans. Fundamentally, there are differing environmental perceptions among South Africa's different socioeconomic groups and different demographic groups (Kirsten & Biyase, 2023).

Extensive literature has explored how individuals perceive environmental issues based on their socioeconomic status and demographics (Kirsten & Biyase, 2023). However, there seems to be a mismatch between the socioeconomic status groups that show more environmental concern than others. Environmental concern refers to worry about the effects of one's own or someone else's behaviour on the environment (Miller et al., 2022). Some research has argued that people with a high socioeconomic standing have a pro-environmental view of environmental issues. Other literature has argued that people with a lower socioeconomic standing are more vulnerable to environmental issues and, therefore, have a stronger pro-environmental view than those on the higher end of the socioeconomic spectrum (Kirsten & Biyase, 2023).

2.6.1 Factors that affect the environmental consciousness of students

It is believed that much of the work to protect the environment can be carried out by young people, specifically students (Pham & Nguyen, 2022). The knowledge they acquire while studying can be used after graduation to write environmental policies which can assist in making the environment sustainable. Fundamentally, education is the first factor that can raise the environmental consciousness of students (Pham & Nguyen, 2022). Education is a long and continuous process that requires the coordination and cooperation of various social forces to focus on schools and universities. Universities in Hanoi, Vietnam, for example, are educating their students about protecting the environment. They also have special self-education subjects that contribute to achieving the goal of environmental protection (Pham & Nguyen, 2022). Universities should thus pay attention to the importance of educating students about the environment and issues affecting it. This is because students are believed to be enthusiastic and will be future leaders.

The second factor that plays a role in raising students' environmental consciousness is culture. Culture refers to the social behaviour of people in society and is used to understand social processes (Stewart & Zaaiman, 2015). People have different cultural traditions that play a role in their survival, which have been adapted over time. An example of this is the Vietnamese and their sense of living in harmony with nature. The Vietnamese traditional culture has a strong

and positive relationship with nature. The people know how to derive value from nature and consume resources in a simple way (Pham & Nguyen, 2022).

The use of social media is the third factor that affects the environmental consciousness of students. Social media interactions can influence behaviour through the circulation of environmental ideologies (Pham & Nguyen, 2022). For instance, in 2019, there were 3.48 billion social media users globally (Digital Trend Stats, 2019). According to a report by the Global State of Digital (2019), in South Africa, about 54% of the population, a representation of over 31 million people who are online, have direct access to the internet. The report indicated that South Africa has the largest market of social media users, with 40% of the population active online. Furthermore, the report indicates that the most popular social media platforms among young people are WhatsApp, Instagram, Facebook, and Twitter (now known as X). A finding from the report is that South African social media users typically spend a third more time online than Americans and double the time that Germans do. Furthermore, the report states that South African social media users spend 8 hours and 23 minutes per day on the internet. Comparatively, social media users in Singapore spend 7 hours and 2 minutes, while those in the United States of America spend 6 hours and 38 minutes (Global State of Digital, 2019). Evidently, social media is excessively used mostly by young South Africans. Consequently, the addictive nature of it can affect the behaviour of students.

Environmental communication is a means to positively affect environmental consciousness. It refers to the dissemination of information about the environment. It is a two-way social interaction that reflects people's attitudes about the environment. Furthermore, environmental communication does not only relate to environmental topics (climate change, pollution, deforestation), but it also considers other information (e.g., to change behaviour, address conflict and to raise awareness) and the role of language, visual images, social media, and various forms of symbolic action (e.g., images that alert, educate and persuade individuals to shape their understanding of environmental issues).

The last factor that can affect environmental consciousness is public awareness. Environmental awareness, specifically, refers to the way people acquire knowledge and understanding through their thoughts, experiences, and senses (Pham & Nguyen, 2022). Fundamentally, it focuses on whether people think about protecting the environment or whether they think environmental protection is the responsibility of authorities (Pham & Nguyen, 2022).

Gaining an in-depth understanding of environmental threats is perhaps difficult for the layperson since it also involves understanding the consequences of humans' damage to the environment. Consequently, many people may feel alienated from environmental issues if they think that there is not much to know about the environment or if they feel the environment is irrelevant to them (Stewart & Zaaiman, 2015). The problem with this attitude is that the natural environment sustains human society, yet it is continuously being degraded by voracious forms of human activity under the guise of economic and human development. In essence, the environment is a shared space between humans and other living things. However, ever-increasing human consumption or human activities upend the notion of sustainable development because the earth's resources are not limitless (Stewart & Zaaiman, 2015). Research to date has indicated that environmental issues, both on a national level and an individual level, involve factors that shape public concern and support for pro-environmental policies (Smith, Kim & Son, 2017). There is the assumption that pro-environmental positions, on a country level, are more significant in developed and wealthier countries. The reason is that developed countries are less pressured by economic necessities (not lacking funding) and, as such, seem to value the environment more (Smith, Kim & Son, 2017). The environment is finite; however, it is being exploited as though it were an infinite storehouse of resources. The only way to ensure the resolution of environmental issues is for individuals to participate in pro-environmental activities and change their bad habits. Achieving such resolutions is a complex process, which can only be done if people understand their relationship with the environment (Akkor & Gündüz, 2017). Therefore, research on the relationship between the environment and human society warrants much attention (Stewart & Zaaiman, 2015).

People from different countries, cultures, and social classes share their concerns about environmental degradation. However, it is equally important to understand people's perceptions about environmental issues since they may assist in resolving these problems.

2.7 The role of young people in raising environmental consciousness and action

According to the latest United Nations (UN) Populations Division estimations, the global youth population comprises 1.2 billion individuals aged between 15 and 24 years. In 2019, these 1.2 billion young people constituted 16% of the world's population (Abarder, 2022). The number of youth is projected to reach 1.3 billion by 2023, peaking around 2065 (United Nations, 2019). The bulk of this increase is expected to take effect in less developed countries, specifically in

Africa. Current statistics show that almost 60 % of the South African population is under the age of 25 (Habiyaremye et al., 2022). The African continent is considered to have the world's youngest population (Beukes, 2021; Habiyaremye et al., 2022). According to the UN Population Division (2022), Africa has a fast-growing population; the current population is 1.2 billion, which is expected to increase to 1.7 billion by 2030. Youth are classified by the African Youth Charter as being those individuals who are aged 15 – 35, representing one-third (420 million individuals) of the African population (Beukes, 2021). This means that young people represent 33% of the total African population. Therefore, the role that the youth can play in addressing environmental issues is huge. Yet, several studies also indicate that the future of young people is bleak. It has also been estimated that by 2050, some regions will experience a decline in their youth populations due to low fertility rates (United Nations, 2019). According to the Youth Progress Index (2020), at a national level, about 62.2% of South African youth live in extreme poverty. This is compounded by the fact that 58.1% of youth between the ages of 15 – 25 and 35.6% of those between the ages of 25 – 34 are unemployed despite varying levels of education.

Despite these concerning statistics, however, South African youth are also seen as people who could become game-changing actors in raising environmental consciousness and addressing environmental problems (Abarder, 2022). Young people play a vital role in raising environmental consciousness since they are influenced by what has happened in the past and how people have, and are still acting. Indeed, South African youth have historically been known for their ability to bring about change. Their positive impact dates back to their significant contributions to standing up against apartheid laws and the resultant changes to the status quo and social structure (Abarder, 2022). Today, South African youth find themselves at the centre of discussions pertaining to ecological injustices, environmental consciousness, and discourses related to climate change. Their involvement in environmental issues can thus be uniquely positioned to overcome barriers to environmental solutions (Abarder, 2022). However, their role in this regard is often vastly undervalued and, as such, can quickly erode (Beukes, 2021).

According to Taufique and Vaithianathian (2018), young people today should be in the driving seat of environmental concerns since the youth, and university students, in particular, have the potential to become experts who will address environmental issues (Taufique & Vaithianathian, 2018). It has also been argued that young people can actively protect and improve the environment (Acharya, 2013); since they are still young, they can change their lifestyles and how they impact the environment. For instance, young people can make their social and

communal spaces, such as institutions of higher education and their homes, more environmentally friendly. They can also personally adopt environmentally friendly practices. In the future, young people will have to live with the consequences of the environmental decisions taken by their predecessors. As a result, future generations will be affected by today's decisions about whether to address environmental issues such as resource depletion and the loss of biodiversity (Acharya, 2013).

In the South African higher education landscape, students have progressively been making their voices heard. However, their focus often tends to be concentrated on social issues – fees as well as other issues, such as the digital divide, unemployment, and food security. Now, however, they need to make their voices heard concerning environmental challenges. Synodinos (2019) argues that preserving the natural environment has become a pressing matter for young people in South Africa. Synodino's premise is based on the assumption that the South African youth is inundated with information about environmental issues or the deterioration of the natural environment. For instance, Generation Y, a youth sub-population known to be tech-savvy, has been growing up with persisting and increasing environmental issues that have been placed in the spotlight on a global level. This exposure has heightened the need to know how environmentally aware South African youth are.

Students need to be involved in environmental discourses as many are enthusiastic, engaged, and well-informed. Furthermore, students can play a key role in fighting against environmental issues owing to their diverse abilities (Beukes, 2021). Students are capable of being change agents who can alter the status quo in various ways; indeed, as previously mentioned, they have a history of contributing to change and are technologically savvy. Paradoxically, however, students can also disrupt, and their lack of engagement in climate-related and environmental issues remains a significant barrier. This is due to factors such as the need for more comprehensive education about environmental issues and capacity development, which can be incorporated into local knowledge (with a global perspective). Such an education would need to consider the lived experiences of young people and the communities they live in. In other words, there should be a tripartite link between students, environmental consciousness, and higher education (Beukes, 2021). Therefore, young people must learn about the environment, its associated problems, and how the environment can be protected.

Young people, in one way or the other, also contribute to environmental issues through their behaviours. As such, their level of environmental consciousness needs to be raised, and changes possibly need to be made to their lifestyles. This consciousness and change can be achieved

through their education at university, which may encourage them to preserve and respect the environment (Olufemi et al., 2019). A way in which young people can be involved in addressing environmental issues or in illustrating environmental concerns is through environmental education programmes. Such programmes can provide a crucial foundational understanding of environmental issues and increase their capacity development. As such, there needs to be curriculum transformation at a tertiary level to include environmental education in the curriculum, to include pro-environmental practices in educational practices, and to create environmentally conscious students. By doing so, students will be able to advocate for a new and sustainable life (Beukes, 2021).

Young people learn about environmental issues by receiving information about the environment. Environmental information is crucial in helping young people acquire knowledge about issues that affect the natural environment. The sources of information range from newspapers, social media posts (i.e., the internet), and school. Since the 20th century, television has also been a prominent source of environmental information. With the advent of advancing technology, the Internet is the predominant source of information, especially among young people. A study about higher education students in Malaysia, for example, found that students reported that the Internet is their preferred source of environmental information (Olufemi et al., 2019). However, the challenge with the Internet as a source of information is the credibility of the sources that provide environmental information (Olufemi et al., 2019).

The involvement and participation of young people in environmental politics is not new, yet social science literature suggests that the participation of young people in environmental movements is under-researched (Feldman, 2021). This is because the propensity of students to participate in protests is influenced by various factors, such as their biographical information (age, gender, and cultural background) and experiences in political engagement (Feldman, 2021). Between the years 2018 and 2019, for example, many young people globally participated in climate change protests known as #Fridays4Future. These global youth movements were mobilised in urban areas and spotlighted what young people in cities think and say about environmental issues; essentially, their concern had to do with the climate crisis. This is a notable trend since research conducted by Prendergast et al. (2021) has predicted that by 2020, almost 60% of the global population under the age of 18 years will be living in cities or urban communities. Despite this prediction, however, there is little research focusing on young people's involvement in climate change protests within diverse cultural contexts. Such research is important since some evidence suggests that there are cultural differences in how

young people participate in environmental protests (Prendergast et al., 2021). The lack of research on the youth's involvement in environmental movements is particularly prevalent in the global south (Prendergast et al., 2021). Some international studies indicate that the youth in the global north express low levels of concern and willingness to participate in environmental protests compared to young people in the global South. Authors posit that this low engagement may be due to the global north's view of the climate crisis as a global, yet still distant, problem (Prendergast et al., 2021).

Contrary to the above, there is the prevailing notion that young people's environmental views are conflicted because the existing links between environmental issues, responsibilities, and actions are not readily recognised (Wilks & Harris, 2015). In other words, according to previous studies, the underlying issue is that young people have not yet fully understood the connectedness between environmental issues, responsibilities, and actions (Wilks & Harris, 2015). The assumption is that young people have placed the responsibility of looking after the environment on the government rather than themselves (Wilks & Harris, 2015). However, young people and students need to be engaged in environmental protection to change their behaviour and attitudes. As such, young people should have a say in environmental politics. They can provide invaluable insights into the development and implementation of sustainable solutions for environmental issues (Acharya, 2013).

China, as a developing country, for instance, is in the process of change. Chinese people have become aware of the environmental problems resulting from deteriorating environmental quality. Consequently, China has started developing ways to curb environmental damage by establishing comprehensive environmental regulations. University students in China today are in a society that is affluent and has become more aware of the environment. Based on this, Chinese students in recent times care more about the quality of the environment, and it is believed that these students will, in the future, become elite decision-makers in society. Their behaviour and attitudes will significantly impact the future of China (Wong, 2003).

2.7.1 Societal issues affecting South African youth

South African youth today face numerous challenges in their daily lives. These challenges include unemployment, crime, poverty, and, most importantly, unequal opportunities in education. South African unemployment levels are among the highest in the world. In the third quarter of 2022, the overall unemployment rate was still a concerning 32.9%. This statistic is

alarming, even though it shows a slight decrease from the 2021 employment rate of 34.99% (Khuluvhe & Ganyaupfu, 2023).

According to the 2022 Census report, South Africa's population was estimated to be 62 million (Statistics SA, 2022). Beyond this, South Africa is considered a youthful population; children and youth amount to nearly 38 million of the South African population. Approximately 51.5% (31 million) of the population is female, while 48.5% (29.6 million) of the population is male (Statistics SA, 2022).

What is most alarming is that 35 million young people aged between 15 – 24 years of age are Not Employed or in Education or Training (NEET). The current NEET rate is 44.2%. Most young people who are NEET come from disadvantaged backgrounds with limited opportunities, which illustrates the potentially explosive social situation that requires urgent attention. South African youth are an essential asset to the country for economic growth, social development, and sustainability. Previously, in 2011, the South African youth population was more than 10 million, and young people made up about 19% of the South African population (De Lannoy et al., 2018).

One of the most pressing issues in South Africa is poverty, which affects many South African youth. Poverty is described as multidimensional since it has an influence on people's experience of social exclusion, trauma, violence, and increased stress levels (De Lannoy et al., 2018). Universities can assist in addressing many of the challenges South African youth face. However, there are many issues concerning universities in South Africa such as entry requirements and the cost of fees (Barnes, 2021). Despite the improvements made in terms of access to higher education, many young people remain excluded as access to universities remains uneven (Mseleku, 2022).

The university landscape in South Africa remains unchanged even after the nationwide #FeesMustFall (FMF) movement that engulfed the country in 2015 and 2016. The #FeesMustFall campaign began over the proposed increase of fees in October 2015 for the 2016 academic year at the University of Witwatersrand, and it later spread to other government-funded universities in the country. Furthermore, the #FeesMustFall movement sparked the national dialogue about the notable changes within South African universities. Essentially, the #FeesMustFall campaign emanated as a revolt against the unaffordability of universities and patterns that shape the sociocultural make-up of universities. Like all the other sectors in South Africa, the higher education landscape is shaped by societal factors such as political, social and

economic discrimination and gender. Therefore, the FMF campaign should not be separated from the South African political and economic landscape, as students are part of the broader society. However, the prevalent contradictions in the higher education sector are a reflection of the broader society (Ntombana et al., 2023).

Countries like Uganda, Zambia, and Kenya experienced similar FMF protests in South Africa in the 1990s. The protests at the time occurred due to access barriers and tuition fees. The FMF movement, however, has not yet achieved its purpose as South Africans still continue to protest due to being financially excluded and having to face unemployment after graduating. What makes matters worse is that students find themselves being confronted by injustices posed by the higher education system.

South African students continue to participate in protests owing to new and historical demands (Ntombana et al., 2023). The waves and cycles of protestation without resolutions in the country have made it obvious that students struggle with many issues that have been boiling under the surface. The post-1994 government made some effort to remove barriers to accessing institutions by opening up opportunities; however, the affordability of higher education remains a big challenge, and this has been the cause of most protests by South African students (Ntombana et al., 2023).

In order for the higher education system to function optimally, key stakeholders (universities, society, the government and the students) involved in the educational sector must have a clear understanding of their roles, needs, resources and challenges. Especially because economic forces that shape society, in essence, affect the higher education sector (Ntombana et al., 2023).

There is minimal research that talks about sustainable development involving young people. Sustainable development speaks to the importance of having young people at the heart of sustainability (Verma, 2016). The reason is that some policymakers may lack the long-term thinking needed to address pressing environmental issues. Engaging young people in organised efforts will promote environmental sustainability (Verma, 2016). It is, therefore, key to involve young people and allow them to have a say in environmental policies. It will enable them to analyse their needs and make decisions about their priorities. Having done so, they are likely to start managing resources efficiently. Therefore, it is young people's responsibility to look after the environment since they can create ideas that will assist in addressing prevailing environmental problems (Verma, 2016). They are the ones who have to live with the

deteriorating environment for a longer period than older generations; they are the ones who will be faced with risks and health hazards. As such, environmental education should be leveraged to mobilise young people to engage with environmental issues. This may, in turn, assist in achieving the Millennium Developmental Goals of climate action, sustainable cities and communities, and environmental sustainability. The prevalent challenge, however, is to translate environmental values into action, specifically regarding lifestyle adjustments. Therefore, environmental issues need to be addressed through action-oriented outcomes and by young people (Verma, 2016).

2.8 Theoretical framework

This study has been informed by two theories, namely the New Environmental Paradigm (NEP) and the Theory of Planned Behaviour (TBP).

2.8.1 The New Environmental Paradigm

Since the 1970s, there has been a long history of researchers measuring people's environmental perceptions. This research has led to the development of a plethora of research instruments (Manoli et al., 2019). The first instrument to widely reach adult populations using a unidimensional construct was the New Environmental Paradigm (NEP), also known as the New Ecological Paradigm. The NEP has since been treated as a scale that measures environmental concerns, attitudes, and values (Manoli et al., 2019). Historically, Dunlap and Catton, drawing on their definition of environmental sociology as the study of societal environmental interactions, argued that the physical environment required sociological inquiry to explain the interaction of social phenomena with other social phenomena (Emari et al., 2016; Hosseinnezhad, 2017). They also criticised the dominant worldview at the time, which they believed was blinding mainstream sociology to the physical environment and ecosystems that were dependent on modern industrial societies. They labelled the then-dominant worldview the Human Exceptionalism Paradigm (HEP), which was later termed the Human Exemptionalism Paradigm. The Human Exemptionalism Paradigm states that humans are exceptionally relative to other species and are seen as exempt from ecological constraints. The HEP refers to four implicit assumptions linked to an unecological model. These four assumptions place humans at the centre of a world with surmountable environmental constraints that cause social barriers (Emari et al., 2016; Hosseinnezhad, 2017). Simply put, HEP threatened the idea of sustainability and encouraged the exploitation of resources for human use and gain (Williams, 2007). Furthermore, it held the view that humans are different from all other living organisms,

that human behaviour is controlled by culture, and that all environmental problems could be solved by human ingenuity and technology.

After criticism of HEP, the New Environmental Paradigm (NEP) was adopted in the 1980s due to out-of-border environmental issues, such as endangered species, pollution, and land desertification. Catton and Dunlap first coined the New Environmental Paradigm in 1978, which was based on the idea that the paradigm would guide empirical research in environmental sociology as it provides specific theoretical guidance for research (Buttel et al., 2002). Initially, the NEP focused on three aspects of the social paradigm: the limitation of growth, the balancing of nature, and advocacy against anthropocentrism (Xiao & Buhrmann, 2017).

The paradigm was introduced as a new way of thinking about a sustainable future. This paradigm focuses on people's mentalities and how environmental issues shape their perceptions (Catton & Dunlap, 1978; Ntanos et al., 2019). It was founded on three main assumptions. The first assumption is that humans are part of the species living on earth and are thus interconnected with other species through their sharing of the ecological living space. This means that humans are independently involved in biotic communities and, in turn, shape human life. The interconnection between species, therefore, shapes social life. The second assumption is that a causal relationship between humans and nature exists. The web of nature has unintended consequences that emerge as a result of cause and effect, as well as feedback from the purposive actions of humans. The third assumption is that the world’s natural resources are finite and are impacted by social and economic growth. The potent physical and biological limits of the environment constrain societal phenomena, including economic growth and social progress (Amerigo, Garcia & Cortes, 2017). Notably, the NEP encompasses the notion that humans are interdependently involved in the biotic community that shapes humans' social life. Human actions have unintended consequences due to the complex cause-and-affect relationships produced in nature. The earth's limited resources also hinder the progress of social phenomena, such as economic growth (Suama, Nadiroh & Neolaka, 2019).

Some of the core elements of promoting environmental sustainability lie in measuring and analysing public perceptions of the environment to achieve a critical goal. One way to achieve this goal is through the NEP (Lundmark, 2007; Emari et al., 2016; Hosseinnezhad, 2017; Ntanos et al., 2019), which has been acknowledged as a reliable multiple-item instrument that captures environmental attitudes and beliefs. It has been used in statistical analyses for several years (Buttel et al., 2002; Ntanos et al., 2019).

Catton and Dunlap's adaption of the NEP signified an environmental transition from a local to a global level. Nonetheless, the underlying assumptions of the original NEP are (1) the belief that humans have the ability to cause an imbalance in nature, (2) there are limits to growth, and (3) humans have the right to rule over nature. Table 2 below differentiates between the NEP and HEP.

The discipline of Sociology was born during the industrial era, a time of the great transition when growth and progress seemed like the natural state of affairs that increasingly enabled modern societies to overcome ecological constraints and humans to control nature – humans to master nature. This mentality became a core belief philosophers called the "Dominant Western Worldview". The core belief led to the ignoring of the biophysical environment. The Dominant Western Worldview manifested through the Human Exemptionalist Paradigm (HEP) worldview. Eventually, the environmentalist movement (stimulated by Rachael Carson) emerged, wanting to replace the exemptionalist view with a more ecologically oriented view. As a result of the differing views, the Dominant Western Worldview, and Human Exemptionalism Paradigm (HEP) – the sociology disciplinary version of the Dominant Western Worldview (DWW) and the New Ecological Paradigm (NEP) were compared based on four assumptions:

1. Assumptions about the nature of human beings
2. Assumptions about social causation
3. Assumptions about the context of human society
4. Assumptions about constraints on human society

Table 2.1 Comparison of major assumptions in the Dominant Western Worldview, Human Exemptionalism Paradigm and the New Ecological Paradigm

Dominant Western Worldview (DWW)	**Human Exemptionalism Paradigm (HEP)**	**New Ecological Paradigm (NEP)**
Humans are fundamentally different from other creatures on earth. Humans are separate from and above nature. Humans are superior.	Human culture makes people exceptional.	Humans are among many other species that are interdependently involved in the ecosystem. Humans coexist with many other species.
People are masters of their destiny. They choose their goals and learn ways to achieve them.	Past experiences of having resources in abundance makes it difficult for people to comprehend scarcity.	The environment/world is finite, therefore, there are potent physical and biological limitations that constrain economic growth and social progress.
People are fundamentally different from all other creatures on earth.	The social environment is key and the functional evolution of society has led to the negligence of ecological embeddedness.	Humans live on earth and they are dependent on the finite biophysical environment. There are intricate linkages of cause and effect, and purposive human action produces many unintended consequences.
The world is vast and it provides unlimited opportunities for humans.	Cultural accumulation means that progress can continue without limit, making social	The inventiveness of humans may seem to extend the global carrying capacity, but the

	problems soluble. Society becomes exempt from natural laws.	exceptional status does not exempt humans from the laws of nature.

Source: Adapted from Catton and Dunlap, 1980; Cykle, 1993

The NEP is a unidimensional measure of environmental attitudes. It measures the overall relationship between humans and the environment. Measuring people's perceptions will assist in promoting people's ecological consciousness to achieve the goal of environmental sustainability (Ntanos et al., 2019). As NEP is the theoretical framework of this study, it raises questions about the benign culture that exists around the ecology. It assumes that the relationship between humans and nature is challenged by environmentalism, which refers to the concern for the natural environment and its protection from excessive human depredation (Harrison & Boyd, 2018). Environmentalism assumes that environmental dangers can be tackled within social, political, and cultural order (Harrison & Boyd, 2018). It further advocates that shifts in attitudes are likely to promote pro-environmental movements such as peace, spiritual, and ecological movements (La Trobe & Acott, 2000).

Theoretically, the NEP seeks to illustrate the adaptive social systems and the interplay of societal paradigms that influence people's motivations. It assists in engaging people to develop pro-environmental practices to address environmental problems (Byers & Gilmer, 2018). It is referred to as the new way of thinking that reflects on the severity of environmental issues, the awareness of the impact of human activities or actions on the environment, and how humans can address environmental issues. The paradigm holds the assumption that socio-economic variables such as age, gender, and economic status can predict people's environmental behaviour. The variables, therefore, are of great importance as age and gender, in particular, are two influential demographic factors of environmental behaviour (Lou & Li, 2021). Essentially, the NEP was developed when discussions about environmental ethics were novel and environmental problems were only starting to be understood by society. Since then, the role of the NEP has not been underestimated in social science research. Theoretically, the paradigm has become the standard multi-item scale used in longitudinal research to explore university students' environmental worldviews. It continues to be used to measure attitudes, values, and worldviews (Bernstein & Szuster, 2018). Merit should be given to the NEP because it has played a significant role in environmental education, especially in exploring the worldviews of young people, in this case, students.

The core elements of promoting environmental sustainability lie in measuring and analysing public perceptions, a key goal that can be achieved. One way to achieve this goal is through the New Environmental Paradigm because people's values and beliefs guide their principles and, as such, are essential to understand when trying to change people's behaviours. They are thought to influence how people judge the severity of environmental problems and how they make choices about which strategies will help them overcome these problems (Lundmark, 2007) The NEP is a concise tool to gauge pro-environmental worldviews. Overall, the key goal of the NEP is to measure the relationship between humans and the environment (Ntanos et al., 2019; Putrawan, 2015). The NEP enables social scientists to gain a better understanding of why people treat the environment as they do. It is a quantitative scale that has measured environmental attitudes in this study to spark pro-environmental behaviour. Therefore, this study's online instrument (the questionnaire) was partly informed by the principles promoted by the NEP, which will be elucidated in the methodology chapter, Chapter 3.

2.8.2 The Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB), since its 30 years of inception, has been used as a rational choice theory. The popularity of the theory emanated from its ability to explain behaviour using a set of variables such as attitude, perceived behavioural control and subjective norm (Muposhi, 2012; Klöckner, 2013; Sniehotta, Pressau & Araujo-Soares, 2014; Sánchez-Llorens *et al.*, 2019).

The origin of the Theory of Planned Behaviour (TPB) (an extension of the Theory of Reasoned Action (TRA) is from social psychology. Its focus has been to determine attitudes through two determinants: behavioural intention and action towards the environment. The extension of the Theory of Planned Behaviour included a variable for Perceived Behavioural Control (PBC). The addition of the Perceived Behavioural Control variable is used to determine how many situations are dependent on external factors that take away volitional control of the subject, such as money, skills, and time. It focuses on how behaviour is influenced indirectly or directly based on beliefs and resources. Therefore, it provides better control of individuals' intentions. The direct influence is determined by focusing on an individual's confidence and effort to commit behaviour. Meanwhile, indirect influence is characterised by the determination of an individual's intention through attitude. In this instance, intention is an indirect determinant of behaviour.

Fundamentally, studies that measure attitudes and behaviour have their basis in social psychology and map the determinants of individual behaviours and the conscious decisions made by individuals. This study was focused on the theory of planned behaviour. It briefly made reference to the theory of reasoned action (TRA) by focusing on identifying determinants of action based on rational motivation, context, intention and behaviours. With a specific focus on subjective norms and attitudes towards behaviour. In the case of the study, how participants treat the environment as a determinant of their behaviour based on their social context. The next theory was the theory of planned behaviour (TPB), an extension of the TRA, that looked at the perceived behaviour of respondents based on cognitive, affective, and intentional behaviour. Behaviour that is based on beliefs, opportunities, and resources. Overall, the two behavioural theories developed by Azjen & Fishbein in 1975 focused on intentional behaviour towards the environment. Fortunately, researchers have learned to understand people's environmental behaviour through behavioural theories, the theory of planned behaviour (TPB) being one used in the study. Such a theory includes psychological factors and perceived behavioural control.

To date, the theory has been applied in various aspects such as leisure science, sport behaviour and health-related behaviour. For this study, the theory of planned behaviour has been employed to determine the environmental behaviour of the respondents. The theory of planned behaviour explains the determinants that influence an individual's conscious decision to conduct behaviours in complete volitional control (Chen, 2020).

The Theory of Planned Behaviour (TPB) is a complex model capable of predicting pro-environmental behaviour. It is the extended and earliest version of the Theory of Reasoned Action (TRA), an approach used in social psychology (Nguyen et al., 2018; Hagger, 2019). Since TPB is an extension of TRA, it differentiates between the subcomponents of subjective norm, attitude, and perceived behavioural control (Hagger, 2019). Initially, TRA focused on predicting the variability of people's behaviour across various contexts, such as population. However, it did not account for behaviours that were not under the control of individuals. To counter this, TPB provided an additional predictor of intention by introducing perceived behavioural control (Hagger, 2019).

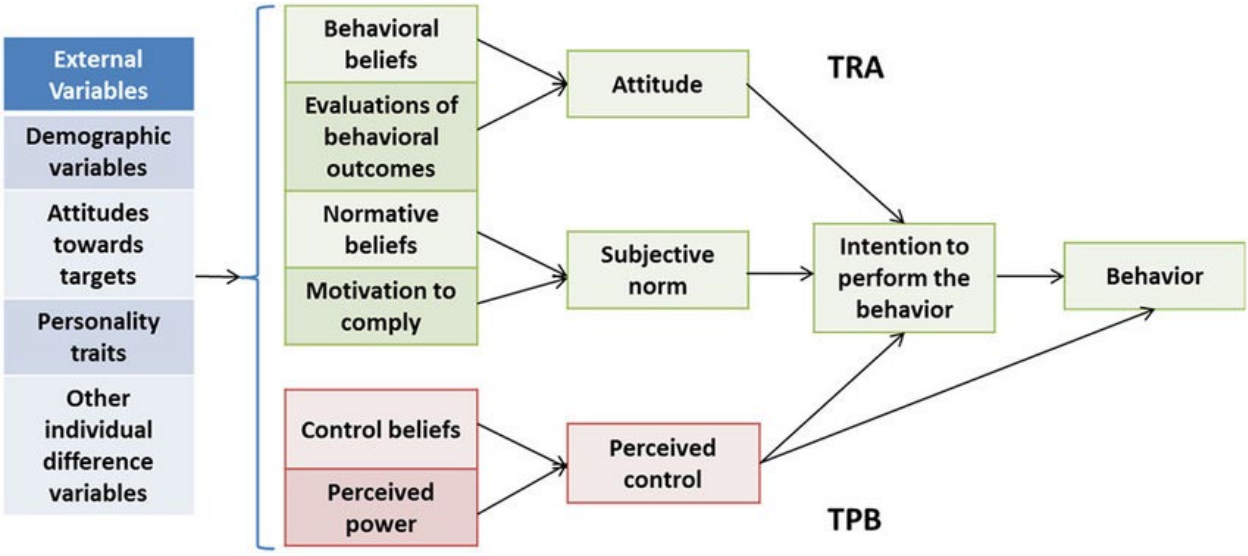


Figure 2.4 The Theory of Planned Behaviour Model

Source: Hagger, 2019

The diagram above signifies the difference between the TRA and TPB theories. Behavioural theories such as TPB are employed to explore the reasons behind environmental protection behaviours. Usually, they predict an individual's behavioural intention, which is determined by their subjective norms, attitudes, and perceived behaviour (Tsai & Tan, 2022). The TPB is based on the premise that it can explain the connection between intentional attitudes, knowledge, and people's actual behaviour that influence waste management practices. It focuses on the cognitive variables of individuals, such as acting skills and personality variables, which include personal responsibility and attitudes (Akintunde, 2017). Such a theory can assist individuals in determining their level of environmental literacy (Akintunde, 2017). Moreover, the theory can be used to urge people to engage with the environment in sustainable ways (Akintunde, 2017).

The figure below is a conceptual framework of the theory, where the researcher included some of the facets of environmental consciousness.

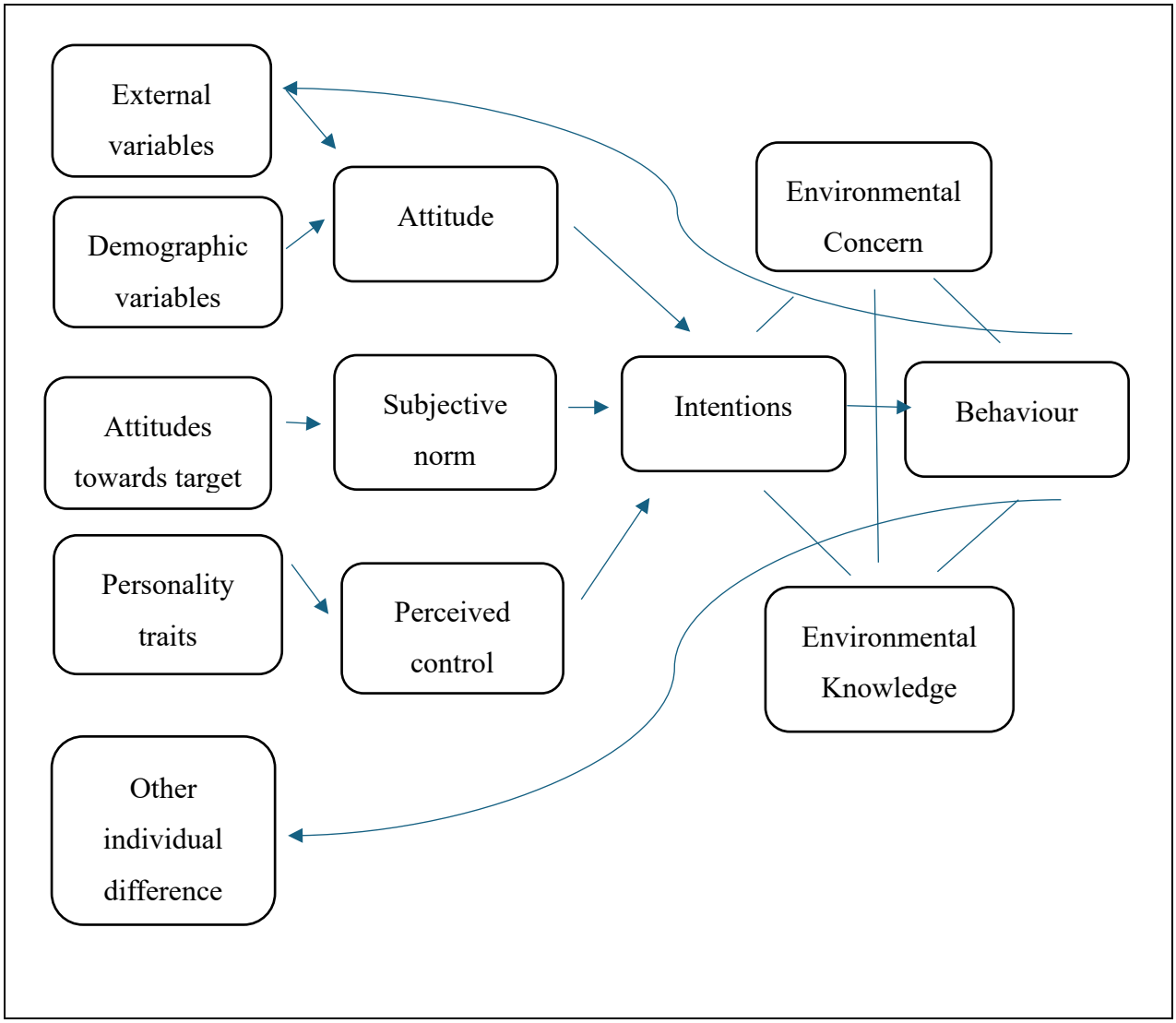


Figure 2.5 Conceptual Framework of Theory of Planned Behaviour

Source: Adapted from Ajzen, 2011 & own compilation

In essence, the Perceived Behavioural Control measures the perceived ability of a subject to perform an action if he/she wishes to; it diminishes the level of uncertainty. Some studies have expanded on the behavioural patterns of people. The theory of planned behaviour is one of the theories used as a point of reference to explain the factors that affect people's actions and attitudes (Ndum et al., 2022). Arguably, the theory is considered the best way of forecasting behaviour, as it simply asks people whether they intend to behave in a certain way. The theory presumes that intention can explain behaviour through attitude, subjective norms, and perceived behavioural control.

The theory is likely to induce pro-environmental habits and attitudes (Joachim et al., 2015). TPB is one of the most influential approaches to predicting and understanding intentional human behaviour (Hagger, 2019). Furthermore, it assists in understanding whether people have

ecological or non-ecological intentions. It relies on the formulation of expectancy to describe how an attitude toward a behaviour is formed. An attitude, for instance, is formed through already existing beliefs. According to what is being investigated, the theory focuses on the determinants of behaviour and can be applied to any behaviour of interest (Ajzen, 2020).

Environmental attitude refers to the psychological tendency of people to evaluate the natural environment and the factors that affect the quality of the natural environment (Lamiño Jaramillo et al., 2022). There are three environmental attitudes that people can have depending on their level of concern for the environment: selfish, biosphere, and altruistic. The selfish attitude focuses and reflects on an individual's personal environmental concerns. The biosphere attitude considers the level of concern an individual has about all biotic things, such as ecosystems, animals, and plants. Finally, the altruistic attitude focuses on the core of society and the relationship between humans and the environment (Lamiño Jaramillo et al., 2022).

Environmental behaviour is deemed to be socially conscious behaviour. This means that it involves the individual, social responsibility, and social aims that require one to behave in a particular way. Furthermore, it suggests that for an individual to achieve their goals, their actions must be influenced by their intentions and motivations (Joachim et al., 2015). For instance, some people believe that the consequences of global warming are uncertain and will only take effect in the distant future. In their view, it is as if environmental changes do not affect them personally. Such a view highlights the urgent need for societal change, particularly concerning environmental matters. People need to become conscious of the fact that a reciprocally beneficial relationship exists between humans and nature and that the integrity and health of the environment are vital for the development of society.

However, the prevailing anthropocentric mentality must first be addressed before change can occur (Macovei, 2015). Therefore, it is important to explore people's attitudes towards the environment as these attitudes directly influence people's behaviour (Amerigo, Garcia & Cortes, 2017). An attitude generally refers to people's way of thinking or their feelings about something. According to Azjen & Fishbein (2005), there are two types of attitudes. The first type refers to the general attitudes people have towards physical objects, including institutions, race, and policies. The second type refers to the attitudes that inform specific behaviours. Environmental attitudes entail people's general feelings about the environment and their specific environmental concerns. It includes people's feelings about how environmental problems can be remedied. Environmental attitudes can thus be defined as the psychological tendency to either favour or not favour the environment, which is expressed when they evaluate

the natural environment (Amerigo, Garcia & Cortes, 2017). Generally, knowledge underlies people's thinking when they deal with and solve environmental problems (Suama, Nadiroh & Neolaka, 2019). Therefore, people's knowledge, specifically knowledge of the environment, is affected by their behaviour towards the environment (Putrawan, 2015). There are also key socio-economic factors that affect people's environmental attitudes and perceptions. Factors that affect individuals at a personal level are, for example, age, gender, level of education, population, or ethnicity. External factors include location in terms of dwelling types (Dlamini et al., 2020).

2.9 Summary

This chapter started with a detailed definition of the environment as well as a discussion of the environment's functions. Furthermore, it extensively discussed what environmental consciousness is since this concept is the main focus of the study. The many definitions of environmental consciousness were discussed, and the definition directly relating to this study was specified. Environmental problems were also broadly discussed alongside the discussion of what the drivers of environmental change are. Specific attention was given to environmental degradation. Moreover, the role of young people in raising environmental consciousness globally was delineated, as well as the factors that affect the development of young people's own environmental consciousness. After reviewing the literature on environmental consciousness, the study's two theoretical frameworks, NEP and TPB, were discussed.

The NEP focuses on the human-nature relationship by quantitatively measuring attitudes, while the TPB looks into the human-nature relationship by focusing on individuals' attitudes, behaviour, and knowledge. The TPB determines how individuals perceive the environment and respond to environmental issues, and so humans' environmental behaviour is qualitatively examined through the TPB. Both the NEP and TPB were employed in this study to determine students' environmental behaviour. Overall, this chapter has provided an extensive discussion of the literature in the field of environmental awareness and has emphasised the study's significance by showing what gaps exist in the current literature. The next chapter, Chapter 3, will provide a methodological account of the research.

Chapter 3 Research Design and Methodology

3.1 Introduction

This chapter provides an account of the methodology used for this study. The researcher needed to adjust the initial research methodologies to make provision for the challenges presented by COVID-19 since the study commenced in 2020. This will be explained in more detail in this chapter. The researcher employed a mixed methods approach, including both quantitative and qualitative research methods. The researcher gathered quantitative data from an online survey and qualitative data from mini groups. By gathering both quantitative and qualitative data, the researcher was able to gain greater insight into the topic under investigation. This data was then analysed in light of the literature discussed in the comprehensive literature review (Chapter 2), which acted as a secondary analysis to build and strengthen the data analysis and arguments of this study.

This chapter details what data was necessary to respond to the aim and objectives of the study. This chapter also details the chosen research design, the target population, and the method of sampling used. Moreover, the data collection procedures are explained, as well as how the data were processed and analysed. Lastly, the limitations and ethical considerations of the study will be discussed.

3.2 Data required for aim and objectives

The primary aim of the study was to determine the extent to which students at the University of the Free State (UFS) are environmentally conscious. Secondary objectives were also determined to investigate this primary aim. Table 3.1 below delineates both the primary aim and secondary objectives of the study, along with the data required to achieve each of the objectives.

The primary aim of the study	Data required
To determine the extent to which students at the University of the Free State (UFS) are environmentally conscious.	Primary data & secondary data: Literature review & mini group.
Secondary objectives of the study	**Data required**
To explore the level of environmental knowledge, awareness, and perceptions of students.	Literature review, survey data & mini group.
To determine students' perceptions of the relative importance of both global and local environmental issues.	Survey data & mini group.
To ascertain the environmental attitudes and actions of students, and their willingness to protect the environment.	Survey data, literature review and mini group.
To explore any possible correlations between students' perceptions of environmental issues and their socio-demographics.	Literature review, mini group, and survey.
To formulate guidelines to increase the environmental awareness of young people, and students in particular.	Literature review, survey data, and mini group.

Table 3.1 Delineation of primary aim and objectives and the data required to achieve each of the objectives

Source: own compilation

3.3 Research design

When choosing a research design, the researcher needs to construct a design that best suits the research situation and research questions (Schoonenboom & Johnson, 2017). This study used a mixed methods research design embedded in triangulation to answer the research questions aimed at determining the level of students' consciousness of environmental issues. Methodological triangulation involves the complex process of combining both quantitative and qualitative methods to maximise the validity of the study (Kelle et al., 2019).

The term ‘mixed methods’ has been regularly used since the 2000s and describes the way in which researchers can integrate different methods in a research study. Other terms, such as multi-methods, methodological triangulation, mixed research, and mixed methodology, have also been used to refer to the integration of methodologies (Kelle et al., 2019). Mixed methods research is defined as a way of collecting and analysing quantitative and qualitative data in a single study to gain an in-depth understanding of the research problem (Creswell, 2012). Mixed method research involves the use of concurrent triangulation. This was the approach used by the researcher to cross-validate the findings within the study. For this research, the researcher triangulated two different primary data sets by examining the evidence and using the data to build a coherent justification for the themes. In this regard, both the quantitative and qualitative methods provided a comprehensive analysis of the research problem. The use of a mixed methods approach has gained popularity in addressing environmental issues at a multidisciplinary level (Wang et al., 2020). By using the mixed methods approach, the researcher addressed the limitations (such as a lack of generality of obtained results, bias, lack of concern and validity concerns) of using a single method to provide an understanding of environmental consciousness.

The advantage of using more than one research method is that it enables the researcher to work with different types of data (Stewart & Zaaiman, 2015). The main goal of employing a mixed methods approach in this study was to expand and strengthen the study's conclusions. Integrating quantitative and qualitative data in the form of a mixed methods design strengthens the rigour of the research and further enriches the analysis and findings (Rahman, 2016). The mixed methods approach was completed in two phases. The quantitative component of the study (Phase One) employed an exploratory survey design embedded in a cross-sectional time dimension. The study employed an online questionnaire to gather raw data to establish trends and patterns for statistical analysis. The questionnaire was administered to students enrolled at

all three campuses of the University of the Free State (the Bloemfontein campus, the South campus, and the QwaQwa campus). The second phase of the study, the qualitative phase, aimed to generate in-depth data by referring to participants' points of view. Qualitative research is naturalistic, and it requires the researcher to focus on the real-world setting. The qualitative component constituted mini groups as a data collection method. A mini group is similar to a focus group, only smaller, containing between two and five participants. Mini groups are a qualitative research method that can be used when a topic area is difficult and may need to be explained to participants more clearly. Mini groups originate from focus groups; they are best used when participants are difficult to find and only a few participants are available (Cormack, Postavaru & Basten, 2018). This was the case for this study. The next section will detail the study's sampling methods as well as the target population.

3.4 Target population and sampling

The target population consisted of registered undergraduate and postgraduate students from the University of the Free State (UFS). For the survey, a multi-stage random sample was drawn to include students from across the three campuses: Bloemfontein, South, and Qwaqwa. Based on the total number of enrolled students at the UFS in 2020 (n=41, 602) (UFS Annual Learning & Teaching Report, 2021), the random sample size consisted of 380 respondents (at a 95% confidence level and 5% confidence interval). To allow for an estimated sample mortality of 35%, a total sample size of 585 was decided upon. The total sample size was proportionately stratified across all three campuses. The online survey was completed by 416 respondents. The quantitative sample population included students from all gender types, ages, ethnic groups, and faculties (i.e., the Humanities, Natural and Agricultural Sciences, Education, Theology, Economic and Management Sciences, Law, and Health Sciences).

Convenience sampling was used for phase 2 of the research, the qualitative phase. In total, nine participants took part in the qualitative phase of the research, which followed the survey completed by a sample of students on all three campuses. The second phase required the researcher to find participants who were available to act as participants. The types of sampling employed in this study were determined by the research questions and available resources. Essentially, the relationship between the quantitative and qualitative sampling methods yielded quality meta-inferences resultant of the sampling integration. In other words, the study combined quantitative and qualitative research methods. With the quantitative sampling method, it involved selecting the sample of respondents to gather the numerical data to be

analysed statistically. Furthermore, the qualitative sampling method enabled the researcher to select a small number of participants to gather in-depth and descriptive data containing the personal experiences and opinions of the participants. The sampling integration was done to better explain or interpret both the quantitative and qualitative findings. Therefore, the meta-inferences are the conclusions drawn by synthesising the findings from both the quantitative and qualitative data. For this study, respondents who completed the online survey were asked to participate in the follow-up mini groups (if they expressed interest), which is how the sampling methods were integrated.

3.5 Measuring instruments and data collection

A sequential explanatory approach was employed for data gathering; it involved two phases. The first phase was the survey phase, and the second phase was the mini groups phase. In other words, the data was collected using various data collection methods, including a literature review, the distribution of an online survey questionnaire (see Appendix B), and three mini groups. The online questionnaire contained a description of the study and a statement of consent to participate in the study. The questionnaire was created online using *Questback* and the questionnaire items were influenced by the New Environmental Paradigm (NEP), as broadly discussed in the previous chapter. The online survey questionnaire was divided into three parts. The first part contained biographic questions, and the remaining two parts contained matrix tables with statements and Likert scales addressing similar variables to the items on the New Environmental Paradigm (NEP) scale, which is a survey instrument that measures people's environmental concern, environmental attitudes and behaviour (measures pro-environmental behaviour). The qualitative questions in the interview schedule mirrored some of the statements from the survey questionnaire that evaluated the environmental perceptions and behaviour of the participants to determine their environmental consciousness and essentially increase the reliability and credibility of the data gathered. The qualitative interview schedule assisted the researcher in collecting rich and in-depth information about the participants' behaviour towards the environment and their perceptions of the environment and environmental issues.

Before the first phase, the questionnaire was piloted. The researcher piloted the study in 2022 with a sample of students enrolled for a third-year sociology module, Social Theory (SOCT3718). The researcher requested permission from the module lecturer to share the information with the students. There were 20 respondents who participated in the pilot study.

The purpose of the pilot study was to test the validity of the questionnaire and the readability of the online study consent form. The pilot also helped the researcher to determine how the respondents would engage with the content online. Upon completing the pilot study, no changes were required to the research instrument as all the questions were answered in the online survey, which indicated that the 20 respondents engaged well with the online content. This quantitative data collection process was the first phase in the sequential explanatory design. The questionnaire was distributed through the university survey distribution canal, and the consent letter (see Appendix A) was shared via the university surveys email address (surveys@ufs.ac.za). The respondents accessed the survey through a link provided to them by the UFS research office via their UFS4life email address. The quantitative data collection ran from May – June 2022.

There are several advantages to using an online survey. Online survey questionnaires are cost-efficient and, thus, the most affordable way to gather quantitative data. COVID-19 presented an opportunity to gain invaluable insights using an online survey. Online platforms are also useful in generating substantive and short responses from participants (Regmi et al., 2016; Dodds & Hess, 2020). Logistically, using an online survey made recruiting respondents easier, as 416 respondents completed the online survey. However, the disadvantage of online surveys is that respondents might not truthfully provide the correct responses. They may also leave some questions unanswered, particularly those they do not understand (Stewart & Zaaiman, 2015). The online survey in this study served to identify preliminary trends that were then explored in more depth during the qualitative data collection process.

By the time phase 2, the qualitative data collection phase, commenced, the researcher was presented with an opportunity to collect the data face-to-face still observing COVID-19 safety and health regulations. After finalising the qualitative questions, the researcher compiled the interview schedule (see Appendix C) to inform and enrich the quantitative data already collected. The second phase was grounded in an interpretative method. The trends and themes that emerged from the quantitative data were used to develop open-ended and unstructured questions that were then posed to the mini group participants. The format of the mini groups meant that participants were able to respond using their own words. The researcher recorded the mini groups, which lasted for a period of one hour per session. When collecting qualitative data, the quality of the sound is vital for the purpose of future transcription (Greeff, 2020). Therefore, the sessions were recorded to validate the research and to make it easier for the researcher to transcribe the data before analysing it. Three mini groups were conducted, and

participants were identified via the online survey. The qualitative interview questions were underpinned by the Theory of Planned Behaviour (TPB), as discussed in the previous chapter. In essence, the questions measured the environmental perceptions and behaviour of the respondents.

The mini group participants were also given a set of questions that allowed them to talk about their experiences. This was done to probe the participants' knowledge, thoughts, and feelings about the environment. The information that was obtained during the research assisted the researcher in developing and formulating guidelines on how to increase environmental awareness among students. By employing multiple qualitative research methods, the researcher was able to gather reliable and comparable qualitative data. As Creswell (2012) argued, the qualitative data collected contributed to the rigour of the study and enriched the quantitative data gathered for triangulation purposes. The mini groups were the ideal method for gaining an in-depth understanding of social issues (Nyumba, et al., 2018) and determining students' levels of environmental consciousness.

The nine participants who participated in the mini groups were contacted personally (after they expressed interested in participating in the follow up phase of the qualitative data collection) by the researcher to determine their availability for the data collection process in June 2022. However, since the participants were available at different times, the researcher was hindered from being able to host one large focus group session. In addition to scheduling conflicts, the institution had imposed COVID-19 regulations, and some students were writing exams. The researcher then explored multiple qualitative data collection methods (using the same interview schedule) to accommodate the participants' availability for the mini group discussions. The data collection thus started with a mini group of two participants.

The mini group methodology was ideal for this study as it enabled discussion and made it easier for the researcher to identify themes that could be further discussed in the following sessions. Based on the responses provided, the researcher was able to make preliminary inferences from the data and highlight common themes that were then verified when the data was transcribed. Participants were each assigned a number to identify themselves when speaking or answering a question. This was also done to assist the researcher when taking notes for transcription purposes but, most importantly, to maintain the confidentiality of the participants.

The first mini group participants were both undergraduate students: a Law student (fourth year) and a Natural and Agricultural Science student (final year). The second mini group discussion

consisted of four participants: One Economic and Management Sciences student (postgraduate), a Natural and Agricultural Sciences student (Ph.D. candidate), a Humanities student (honours), and a Law student (postgraduate). The last mini group discussion consisted of three participants: One Humanities student (Ph.D. candidate), one Economic and Management Sciences student (master's), and one Humanities student (undergraduate).

3.6 Data processing and data analysis

The study also adopted a reflexive thematic analysis approach (for qualitative data collection) to examine participants' experiences and perceptions of the environment and environmental issues. This approach allowed participants to express themselves more freely during the various mini-group sessions.

The Statistical Package for the Social Sciences (SPSS) program was used to analyse the quantitative data. Univariate and bivariate analyses were used to interpret the quantitative data. Descriptive statistics (univariate data) were used to describe respondents' biographic information and the research variables. Pearson correlations were calculated to determine the research variables. To strengthen the research variables, factor analysis was employed, and from it, other statistical tests were run that provided further perspective on the data modelling processes that were followed in the study (reliability analysis, exploratory factor analysis, and polychoric analysis). In other words, factor analysis was used in this study to refine the research variables, which further informed statistical tests (such as reliability, exploratory factor and polychoric analysis) to better understand and explain the modelling process. Initially, the analysis was completed on Jamovi, an open-source R (a programming language software for statistical computing and graphics) used for data cleaning and analysis), which is a user-friendly SPSS alternative (Seol, 2023). Before the analysis, the data were cleaned. The data-cleaning process involved the following steps: 1) Recoding categorial questions as Ordinal or Nominal, and 2) Identifying and coding missing values.

The statistical tests also contained the Root Mean Square Error of Approximation (RMSEA), which determined the fitness level of the models employed. There were also assumption checks to indicate how the data was distributed. Analysing a mixed methods study is complex, and the researcher needs to be adept at analysing both the quantitative and qualitative data and integrating the results. Mixed analyses involve several phases, such as data transformation, data correlation, comparison, and analysis for inquiry, conclusions, and inferences (Onwuegbuzie & Combs, 2011). The data of the study were collected simultaneously at the

three campuses and were analysed as a single set. The researcher gathered data from all the three campuses at the same time, rather than collecting data at different times at the different campuses. Thereafter, the data were combined into one single dataset and analysed as a whole, rather than analysing the data separately. This implies that the researcher looked at the overall trends and patterns across the three campuses. The researcher coded and captured the data for both the quantitative component (through the assistance of a data analyst and co-supervisor) and the qualitative component.

3.6.1 Factor analysis for quantitative data

Quantitative research methods focus on the statistical distribution of certain characteristics of various populations (cognitive performance, personal traits, and behavioural patterns). Such phenomena become visible when examined within a large group (Kelle et al., 2019). The use of factor analysis is essential in social research to ascertain how a collection of measured factors has a single common variable effect (Humble, 2020). It is a latent variable technique that essentially tries to find the latent structure based on the correlation between variables. Furthermore, it can be used to extract variables for further analysis, such as regression methods or group comparisons (ANOVA (Analysis of Variance), T-Test). Factor analysis is a technique used to reduce a large data set to fewer factors. Meanwhile, an exploratory factor analysis assumes that indicators or variables may be associated with any factor. Factor analysis is a technique used to reduce data into fewer factors so that the intercorrelation groups in the data can be analysed. Factor analysis can either be exploratory or confirmatory. Exploratory factor analysis is usually conducted in the early stages of a study to explore the interrelationships in the data. Confirmatory factor analysis is conducted to confirm the hypothesis established in the dataset. In this study, exploratory factor analysis was employed to evaluate the dimensionality of items in the questionnaire. The questionnaire item responses ranged from “strongly agree” to “strongly disagree”. Exploratory analysis was used in the early stages of the data analysis of this study to explore the interrelationships between the set of variables contained in the five scales of the study. In the subsequent chapter, the researcher provides the results of the alpha coefficients for each of the five scales. Cronbach’s Alpha coefficients were used to measure the reliability of the items contained in the scales.

Reliability is assessed and determined based on Cronbach’s Alpha with values that range from 0.60 to 0.80 indicating acceptable reliability. A value between 0.80 and 1.00 is considered highly reliable. (Purwanto et al., 2023). Furthermore, Cronbach’s Alpha is used to measure

reliability (specifically internal consistency. Reliability refers to the ability of an instrument to measure consistently (it is thought of as repeatability, meaning that if the scales were to be used in research, one would get the same results); the two are closely associated (Tavakol & Dennick, 2011).

Factor analysis was also employed to explore and uncover the smallest number of underlying constructs referred to as latent structures (Humble, 2020). ANOVA was used to conduct the analysis. It enabled the researcher to include more than one factor. A continuous dependent variable and a categorical independent variable are required in ANOVA; ANOVA refers to categorical independent variables as factors. In essence, the additional tests run through factor analysis were used to measure the quality of the instruments, simplify the data, and test the relationship between the variables on the Likert scales used in the study. Factor analysis is usually used when measuring behavioural characteristics. Therefore, it correlates with one of the theoretical frameworks used in the study, the NEP. The factor analysis conducted looked at the relationship between items on the Likert scales, as well as the reliability and validity of the research instrument.

3.6.2 Thematic analysis for qualitative data

Thematic analysis was used for the qualitative data set in this study. Thematic analysis is a qualitative research method that systematically organises and analyses complex datasets (Dawadi, 2020). Thematic analysis searches for themes that capture the essential narratives available in the dataset. The process involves carefully reading and re-reading transcriptions. Theoretically, thematic analysis is a flexible way of identifying, interpreting, and describing themes. The benefits of using thematic analysis in this study are that it made the analysis more valid, flexible, and transparent. The flexibility of thematic analysis allowed the researcher to use deductive and inductive methodologies. For the deductive approach, the large dataset from the online survey was analysed, and themes were identified. For the inductive approach, the themes from the survey were then linked to the qualitative data for further in-depth analysis. The thematic analysis enabled the researcher to identify the differences and similarities apparent in the data. The most important aspect of using thematic analysis is the constant-comparative methods, which require reading and re-reading transcripts in a systematic way to produce an understanding of the data (Dawadi, 2020). The researcher followed a reiterative and reflective process that involved constantly moving back and forth between the datasets during the analysis.

The researcher adopted a six-step process to analyse the qualitative data. Step one required familiarisation with the data; the recordings were transcribed and coded (Walsh, 2019). The researcher organised the data according to the research questions. This involved the constant-comparative method mentioned above of reading and re-reading the data after the recordings were transcribed. The researcher needed to be familiar with the data to determine the number of themes that emerged from the data. This was a crucial step that informed and guided the next research steps.

Step two involved the generation of codes using ATLAS.ti 23 (the newest version of the program at the time of the research). ATLAS.ti is a computing software that analyses data according to themes. Researchers are able to gather and group the data into similar themes. The chosen software was valuable in improving the rigour of the analytical process. The tool was used to identify multiple codes since all the transcripts were coded (Soratto et al., 2020). ATLAS.ti 23 is an example of Computer Assisted Qualitative Data Analysis Software (CAQDAS) used by professionals and researchers from various fields, such as anthropology, criminology, and sociology. It centralises information so that research can be organised. When using the software, the researcher is a mediator who plays the central role of a critical thinker in the analysis process (Soratto et al., 2020). The table below presents the stages of the thematic analysis followed using ATLAS.ti 23:

Phases of thematic analysis	Steps in ATLAS.ti 23
First phase (pre-analysis)	• Creating the project • Adding documents
Second phase (material exploration)	• Reading the data • Coding the data • Grouping the data • Identifying themes
Third phase (interpretation)	• Exploring the coded data • Verifying themes identified • Extracting reports (word clouds)

Table 3.2 Phases of thematic analysis in the study

Source: adapted from Soratto et al. (2020)

In step three, a list of codes, patterns, and themes was identified. The themes were analysed, and some were combined to form overarching / higher-level themes that addressed the research questions. It is worth noting that this process also involved reading and re-reading the data to verify the themes captured. During this process, the researcher was able to link the data to concepts from the literature review and quantitative dataset. To sum up this process, the researcher compiled a thematic map (see Chapter 4), which includes all the identified themes that were refined in step four.

Step four involved reviewing the themes. All the themes (from the main themes to the sub-themes) were integrated. The aim was to refine the themes from Step 3 so that they could be grouped and presented in a systemic way. The themes were checked for coherence and consistency (internal homogeneity). This step involved two levels. For level one, all the coded data were extracted from Atlas.ti and pasted into a Microsoft Word document so that the coded extracts of the themes could be organised in a meaningful way. Again, the researcher needed to re-read the collated extracts to form a coherent pattern. Level two involved validating each theme. The researcher verified the themes identified via ATLAS.ti 23 using another statistical program, R, to create word frequencies. This level involved the creation of a thematic map that accurately reflected the meanings present in the whole dataset. The thematic map was refined by combining all the themes to illustrate how they address the research questions of the study.

Step five entailed defining and refining the themes. This process involved identifying the essence and meaning of each theme. Moreover, it involved determining what each aspect of the theme captured. In other words, identifying the story each theme told and how each fitted into the study. The themes were refined by reading and finally defining each theme.

Once the themes were finalised, the researcher began with the write-up of the research report, the final (sixth) step of the analysis. Writing the thematic analysis report served the purpose of convincing the reader about the merit and validity of the analysis. This was done to provide a coherent, logical, and concise account of the data represented by the themes. The validity of the analysis was also enhanced by providing sufficient evidence of extracts that captured the study's objectives and what the researcher tried to achieve. In the entire process, the researcher used concurrent data analysis to merge quantitative and qualitative data.

3.7 Limitations

The limitations of this study include the impact of COVID-19 since some of the data were collected online (for the quantitative component, an online survey was used), and other data

were collected face-to-face (for the qualitative component, mini group discussions were conducted). Another limitation was that this study only focused on participants enrolled at the University of the Free State and did not consider students at other tertiary institutions. The generalisations of the findings are, therefore, limited to only one institution. Another limitation was the possible exclusion of students due to a lack of internet access and digital literacy (Dodds & Hess, 2020). Some students may not have been able to access their UFS emails, and thus the questionnaire, by virtue of their not having the right device. Consequently, the time in which the qualitative data collection took place was affected by the student community's availability, which may have affected the low number of participants in the second phase.

3.8 Ethical considerations

The research proposal was evaluated by and received approval from the UFS ethics committee. Ethical clearance was sought from the faculty's research ethics committee and was granted in February 2022. The ethical clearance number is UFS-HSD2020/2066/21. Since the researcher employed a mixed methods approach, she was responsible for conducting the processes of capturing, interpreting, and reporting the data. The responsibility required the researcher to respect the data and treat it with confidentiality. It was, therefore, important for the researcher to know the boundaries of the research (to limit the generalisations of respondents). Generally, in social research, it is rare to see participants at risk of experiencing physical harm during the research process. However, there is always the risk that the questionnaire content induces anxiety for the respondents. This anxiety can be caused by participants' lack of understanding or feeling inhibited from expressing their views because they are among peers. Therefore, it was essential to inform the respondents about the structure and content of the questionnaire and mini groups (participants) to sensitise them to the content and purpose of both phases of the research.

The researcher assured the research participants that participating in the study would not harm them or lead to the loss of their dignity or self-esteem. The researcher came to this conclusion following the pilot study, the results of which confirmed the reduced chances of research participants experiencing psychological abuse or a loss of self-esteem. In the context of this study, the participants did not experience or express any discomfort with the questions that were contained in the interview schedule.

The researcher informed the participants that the information provided would be confidential and that it would be used only for the research and its findings. This was mentioned to them

before the data collection process commenced. Furthermore, research participants were informed that they were not required to provide their personal details in the interest of their confidentiality. They were informed about the purpose of the study, that their participation was voluntary, and that they were not obliged to participate in the study. Participants were provided with an informed consent letter to read through before participating in the study. The consent form contained detailed information about the research. The data was collected online to ensure that all COVID-19 regulations and protocols were followed when the fieldwork commenced, as some regulations were still in place. Therefore, participants did not have to sign and return the consent form as the survey was completed online. Online data collection minimised potential risks to the researcher and participants. As such, participants were informed that clicking on the survey link and opening it, would serve as their agreement to allow the researcher to publish the findings.

By the time the qualitative data collection phase commenced, contact sessions were again allowed on campus. When the qualitative data collection process commenced, the participants were aware that they would be recorded for the purpose of data analysis. The qualitative data collection method required the researcher to find venues that were conducive to the research. The selected venues made it possible to maintain the COVID-19 regulations while the data was collected. Participants were also made aware of their right to withdraw from participating in the research process. To maintain a high degree of confidentiality, all the data was fully anonymised and password protected, and access to it was restricted to the researcher. The information the respondents provided on the questionnaire was encrypted and password-protected to protect the participants. For the purposes of the qualitative research, participants were informed that there were no right or wrong answers to the questions asked and that only their opinions mattered. Out of respect, participants in the mini groups were asked to allow others to freely express their views and to avoid interrupting others. The mini groups were audio-recorded so that the researcher could accurately capture the views and sentiments of the participants during the transcription process and when analysing the data. Participants were informed that they were permitted to leave the sessions at any time and ask for the recording to be paused at any time. Overall, participants were asked to respect the privacy of other participants by not disclosing any of the content discussed. Therefore, the research findings do not include any identifying information, and all audio recordings of the sessions are password-protected. They will be destroyed on completion of the study. In the subsequent chapter, the findings of the study will be presented.

3.9 Summary

This chapter focused on the methodological account of the study. The study's mixed methods approach was unique given the complexities and dynamics that each approach presented, and the varying data collection and concurrent data analysis processes involved in such a study. Ultimately, employing a mixed methods approach for the chosen topic addressed a methodological gap in the literature. The mixed methods approach enabled the combination and integration of factor analysis and thematic analysis in a single study. Multiple tests were conducted to strengthen the mixed methods approach for analysis purposes. In the subsequent chapter (Chapter 4), the findings and results of the study are discussed in detail.

Chapter 4: Results

4.1 Introduction

This chapter discusses the results of the study. It consists of three sections that constitute the clustered research objectives to present the results and findings of the study. A mixed methods approach was used to allow the researcher to acquire multiple perspectives on the issue and analyse the data in ways that complement and strengthen the findings. Section One presents the descriptive statistics of the respondents' demographic profile using frequency tables, percentages, and graphs. Furthermore, the steps used to thematically analyse the qualitative findings are discussed. The discussion includes extracts from the data and tables containing the identified codes. The second section of the chapter discusses the clustered research objectives (one and two) of both the quantitative and qualitative findings of the study. The qualitative results are presented according to the thematic analysis, with the identified themes presented alongside the interpretation of the findings. The section ends with a qualitative narrative of the findings. Finally, section Three discusses the remaining clustered objectives (three and four) of the findings, while inferential statistics (the chi-square results) are also provided. It is worth noting here that some of the data had to be re-coded to comply with the requirements of some statistical tests, such as the chi-square test. The chapter ends with an integrated discussion of the empirical quantitative and qualitative results. This integration enabled the researcher to emphasise the results and findings that address the study's main purpose, which was to determine the extent of environmental consciousness among students at the University of the Free State.

Table 4.1 below summarises the research questions and objectives that were investigated in this study. The results that answered each research objective are provided in the subsequent sections of the chapter.

Research Questions:	Research Objectives:
• To what extent are students environmentally conscious, particularly regarding pressing global and South African environmental issues? • Where do students place the environment amidst other issues of personal and economic concern? • What are students' perceptions of the environment, and what determines their environmental perceptions and behaviour? • What do students perceive as the most important drivers for environmental changes and degradation, particularly in South Africa? • Is there any difference in attitudes towards environmental problems along the lines of biographic variables such as sex, race, and socio-economic background?	• explore the environmental knowledge, awareness, and perceptions of students. • determine students' perceptions about the relative importance of both global and local environmental issues. • ascertain the environmental attitudes and actions of students and their willingness to protect the environment. • explore any possible correlations between students' perceptions of environmental issues and their socio-demographic attributes. • formulate guidelines to increase environmental awareness among young people, and students in particular.

Table 4.1 Summary of research questions and objectives investigated in the study

Source: own compilation

4.2 Section 1: Descriptive statistics, reliability analysis, and qualitative analysis description

4.2.1 Descriptive results (quantitative data)

This section outlines the frequency distributions of the online survey containing non-identifying biographic information. The online survey contained 14 questions (see Appendix B), and a total of 416 records were captured.

4.2.2 Biographic profile of respondents

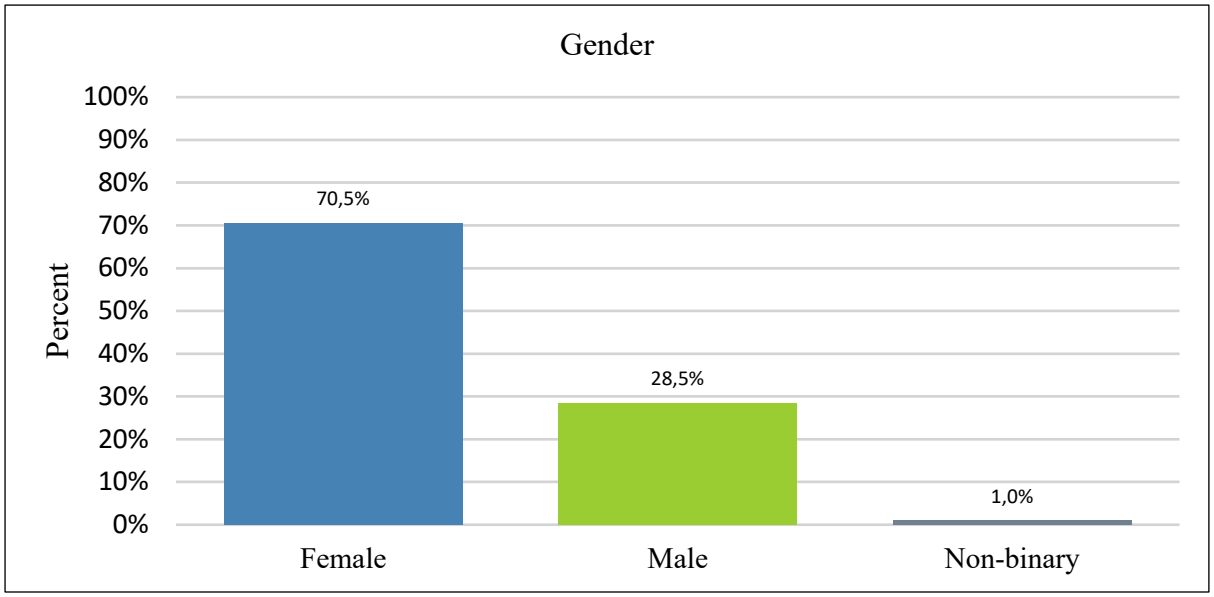


Figure 4.1 Gender of respondents

Figure 4.1 illustrates the gender distribution of the online survey respondents. The data, broken down by gender, shows that the majority (70.5%; n=292) of the respondents were females, followed by [1]males (28.5%; n = 118), and then non-binary (1.0%; n = 4). A similar trend in gender representation was also observed in the UFS Teaching and Learning report (2020), which indicated that there were more female students than male students enrolled at the University of the Free State. Overall, the trend identified in this study is consistent with the gender distribution at both the UFS and in South Africa, where the number of females generally outweighs the number of males.

[1] The n-value deviates from the sample because there are two missing values, as two respondents did not complete the question.

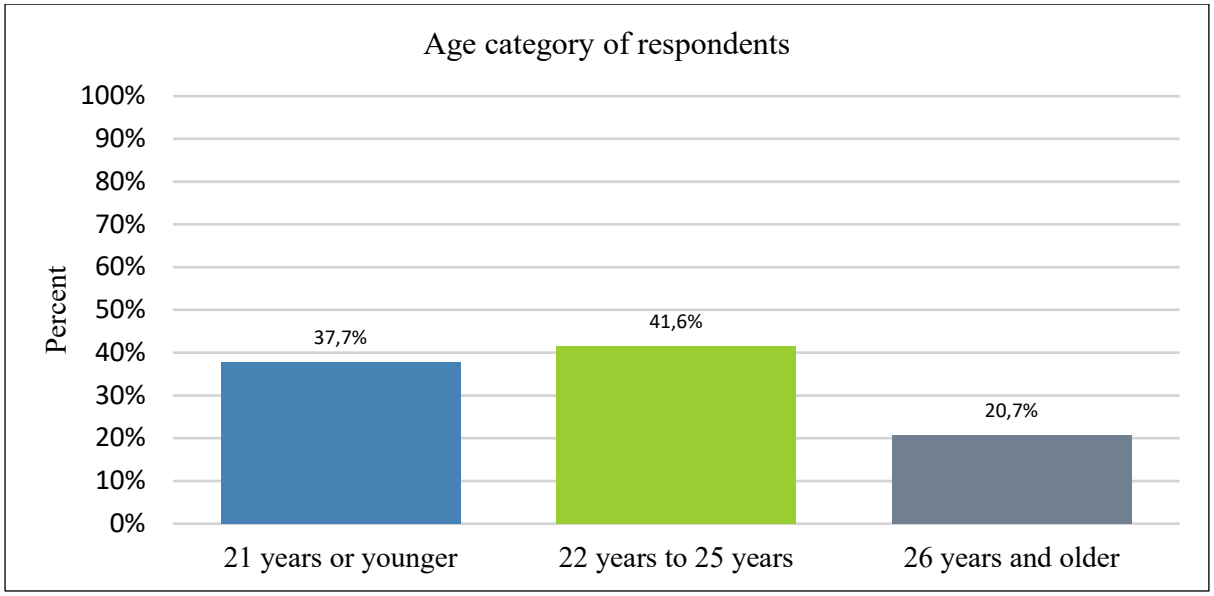


Figure 4.2 Age of respondents

Figure 4.2 above illustrates the distribution of respondents by age category. The age category of respondents indicates that most were between the ages of 22 and 25 years (41.6%; n = 173). This was followed by the age category of 21 years or younger (37.7%; n =157) and then 26 years and older (20.7%; n =86). Age is an important socio-demographic variable for this study because it has been noted that it is a determinant of environmental behaviour (Lou & Li, 2021).

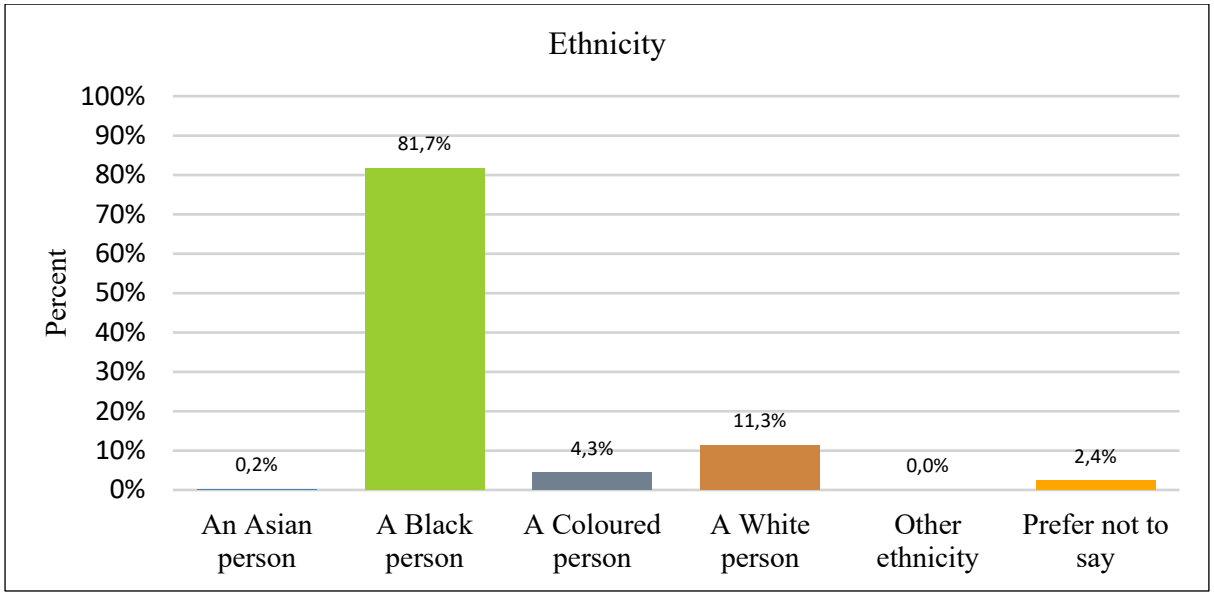


Figure 4.3 Ethnicity of respondents

Figure 4.3 above illustrates the ethnicity of the respondents. The survey data show that the dominant racial group was Black (81.7%; n = 339). The white racial group had the second largest representation (11.3%; n = 47), followed by the coloured racial group (4.3%; n = 18). Only one respondent was Asian (0.2%; n = 1). As with the case of age, ethnicity is also an important socio-demographic factor for this study since it is a variable that has been previously used as a determinant of environmental perceptions and attitudes (Dlamini et al., 2020).

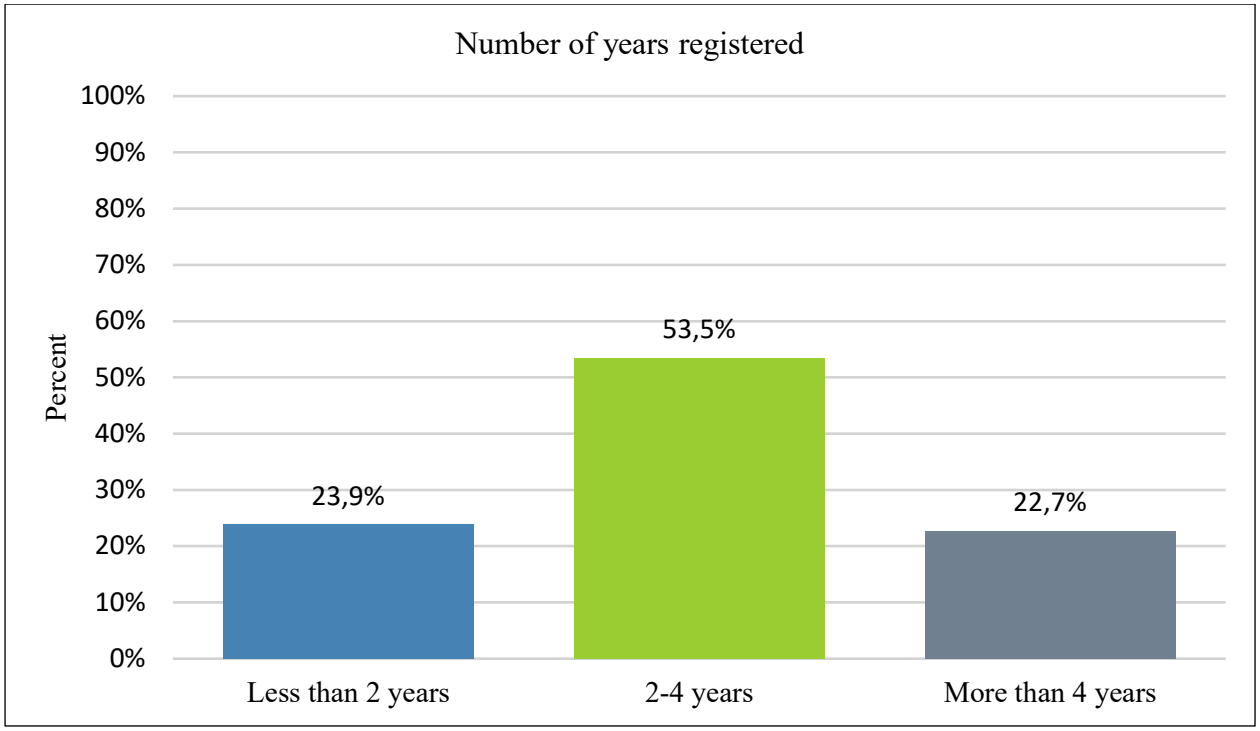


Figure 4.4 Number of years respondents were registered at the UFS

Figure 4.4. above illustrates the number of years respondents were registered at the University of the Free State (UFS) at the time of the online survey. Most respondents (53.5%; n=222) were students who had been registered for between two to four academic years; the next largest group were those students who had been registered for less than two years (23.9%; n=99). The smallest group were those who had been registered for more than four years (22.7%; n=94).

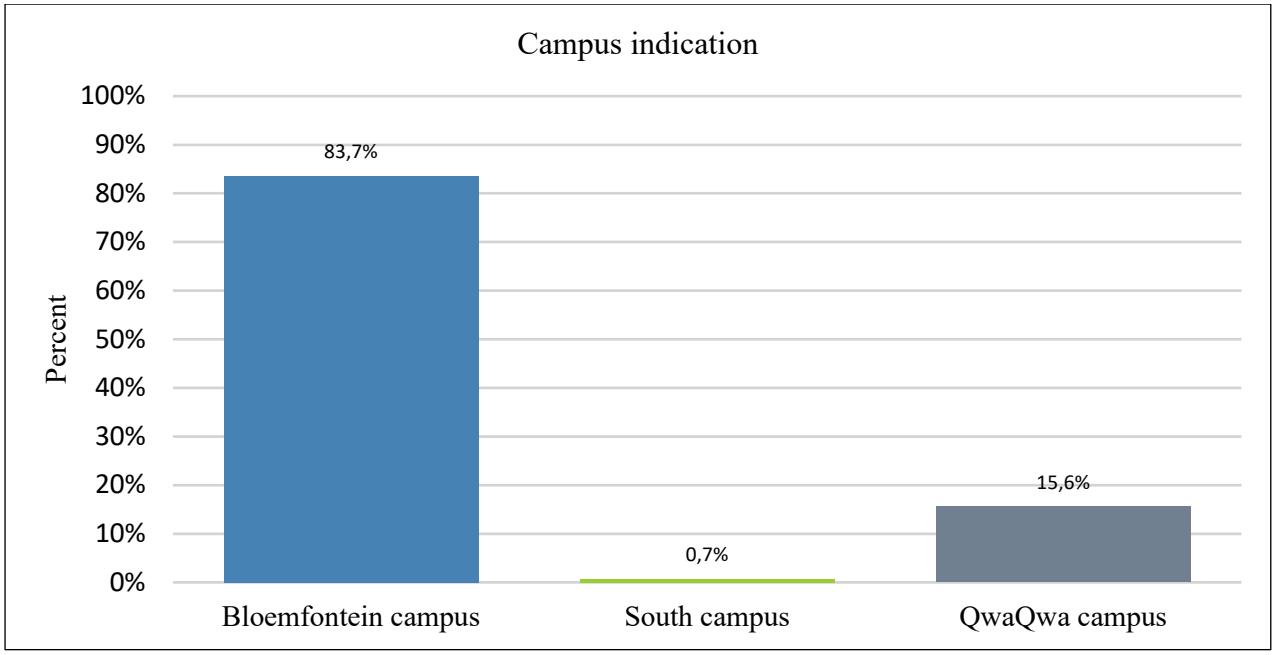


Figure 4.5 Registered campus of respondents

Figure 4.5 above illustrates the campus distribution of the respondents. All the respondents who completed the survey were enrolled on one of the three UFS campuses. Most respondents (83.7%; n=348) were registered on the Bloemfontein campus. The second largest representation came from the QwaQwa campus (15.6%; n=65), and the smallest representation came from the South campus (0.7%; n=3).

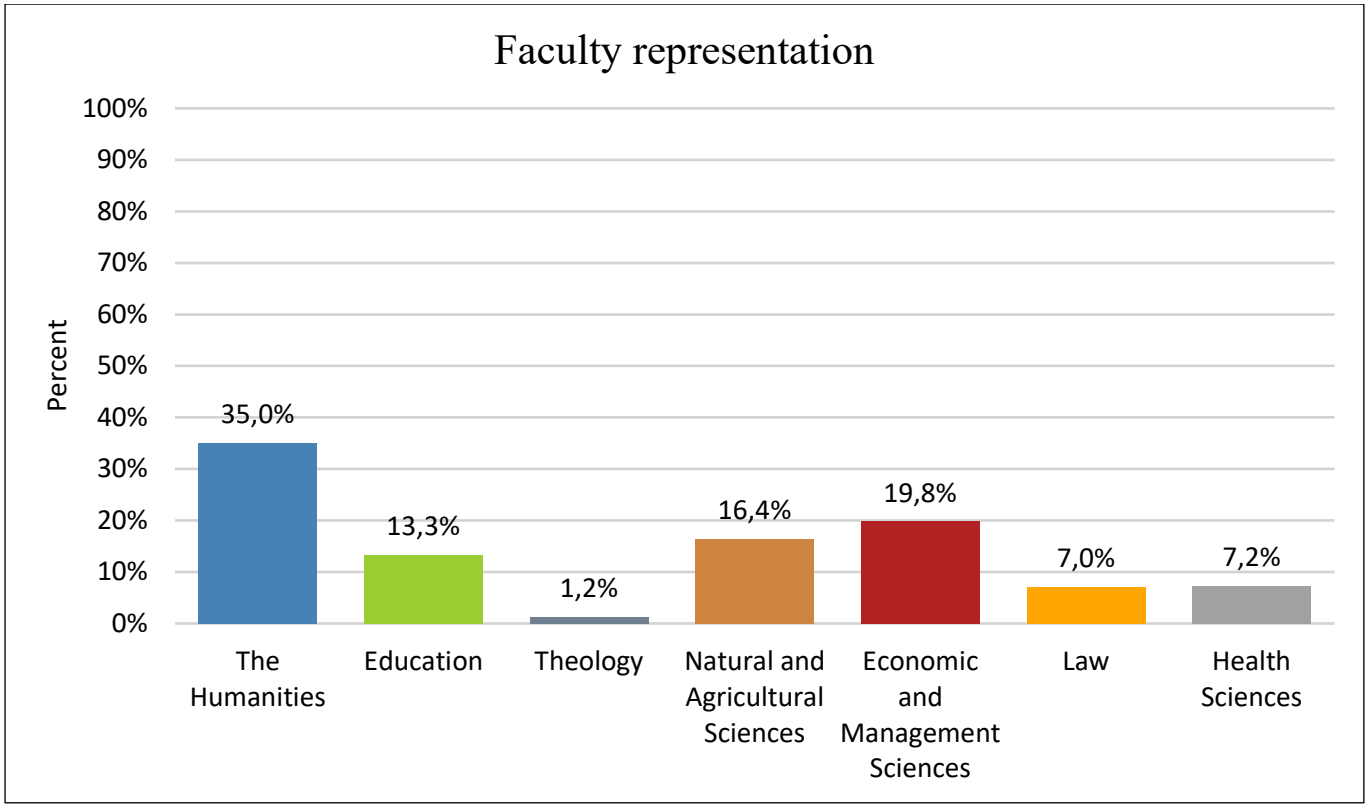


Figure 4.6 Faculty representation of respondents

Figure 4.6 illustrates the faculty distribution of the respondents. All seven faculties were represented. The largest representation came from the Faculties of the Humanities (35.0%; [2]n=145), Economic and Management Sciences (19.8%; n=82), Natural and Agricultural Sciences (16.4%; n=68), and Education (13.3%; n=55). The smallest number of respondents came from the Faculties of Health Sciences (7.2%; n = 30), Law (7%; n = 29) and Theology (1.2%; n=5).

[2] The n-value deviates from the sample because there are two missing values, as two respondents did not complete the question.

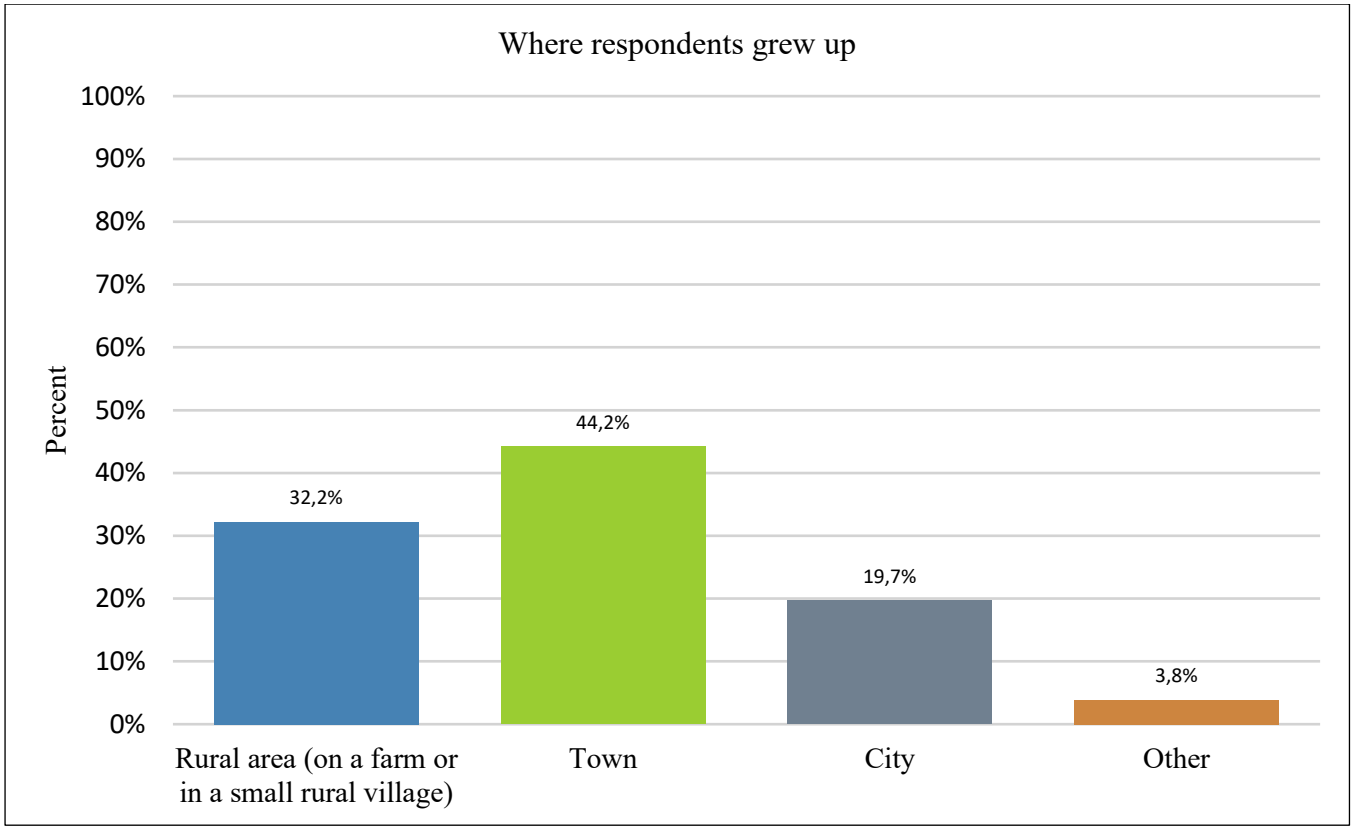


Figure 4.7 Where respondents grew up

Figure 4.7 shows the places where the respondents grew up and stayed for most of their lives. The majority of the respondents (44.2%; n=184) grew up in towns, followed closely by those who grew up in rural areas (32.2%; n=134). Some respondents indicated that they grew up in the city (19.7%; n=82). Other respondents (3.8%; n=16) indicated that they grew up in other areas such as a township or developing town. This is a notable statistic because, as found by Dlamini et al. (2020), dwelling type was significantly associated with a person's environmental perceptions. Dwelling type together with employment status are considered to be the common determinants of both people's environmental perceptions and attitudes. Furthermore, dwelling type and employment status are both considered to be materialist values in nature (Dlamini et al., 2020; Dlamini & Mokhele, 2021b). Additionally, the areas in which individuals grow up in are considered as a socio-economic or demographic factor that determines or can be associated with pro-environmental behaviour (Piao & Managi, 2024). Therefore, dwelling type and area can both be considered as determinants of pro-environmental behaviour. Material values in South Africa are linked to geographical location and ethnicity due to the past policies of separate development.

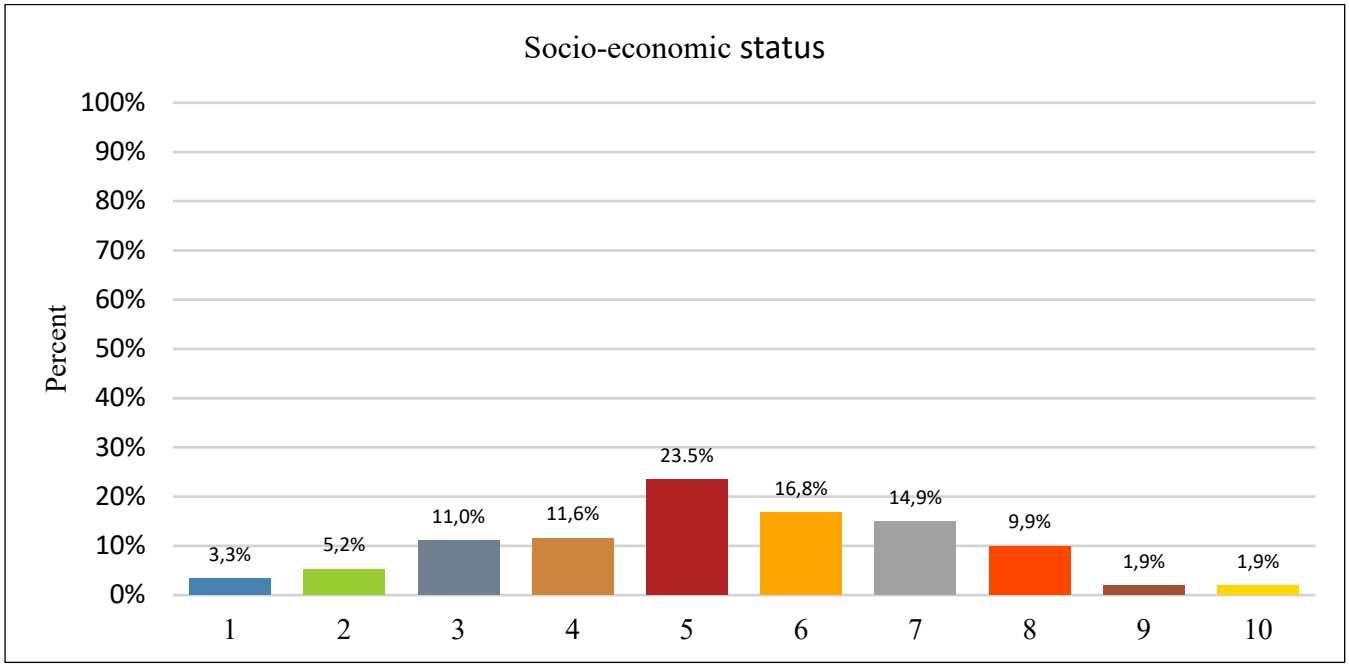


Figure 4.8: Perceived socio-economic status as reported by respondents

Figure 4.8 depicts the socio-economic status of the respondents. Respondents were asked to provide information about the socio-economic status of the households in which they spent most of their childhood. The respondents were asked to assess and rate their perceived socio-economic status (based on factors such as education, income, and occupation) as it allowed the researcher to better understand their behaviour, perceptions, and interpretation of the world. A slider with 10 statuses was provided in the questionnaire (see Appendix B), and respondents were asked to choose any position on the measuring scale between 1 and 10 that best reflected their socio-economic circumstances. The number 1 represented the lowest/worst socio-economic status, and 10 represented the highest/best socio-economic status. The y-axis illustrates the percentage of respondents that fall into each category. Additionally, more respondents perceive themselves to have a low socio-economic status than a higher socio-economic status. Categories 1-3 shows 19.5% and categories 8-10 shows 13.7%. According to Figure 4.8, 23.4% of respondents fell into category 5, while 1.9% fell into category 10. Therefore, 23.4% of the respondents perceive themselves to have neither a high nor low socio-economic status; a small proportion of the respondents perceive themselves to have a high socio-economic status. Overall, the graph suggests that the largest proportion of respondents

fall into category 5 (23.4%), and the smallest proportion fall into categories 9 and 10 (each 1.9%).

The data is note-worthy because it is believed that socio-economic status may affect environmental attitudes. This is because employment status, as an aspect of economic status, is considered a common and significant predictor of both environmental perceptions and attitudes. A study by Hunter et al. (2010), revealed that people's perceptions and attitudes evolve around their socio-economic circumstances, individual experiences, and livelihoods. Indeed, an individual's economic or employment status intertwine with other factors in a complex way. Considering an individual's hierarchy of needs, some researchers have suggested that environmental matters are a luxury for low-income households, which can only be indulged once their basic material needs have been met (i.e., basic shelter, economic security, food, etc.) (Hunter, 2010; Leong et al., 2018). Having now taken the respondents' demographics into consideration; the following section moves on to explain factor analysis.

4.3 Factor analysis

Factor analysis is a multivariate statistical technique that is applied to a single dataset to determine which variables are relatively dependent on other variables (Shrestha, 2021). It is a means of grouping related variables into the same factor. Furthermore, it assumes that all variables correlate with each other to some degree. The variables that are measured should at least be at an ordinal level, and the sample size should be large (Shrestha, 2021). Factor analysis is used to reduce a large dataset into fewer factors. Factor analysis was also conducted to enable the researcher to include more than one factor, for instance, having gender as a factor against items in the measuring scale. Additionally, ANOVA (Analysis of Variance) was used to test for the influence of variables in the dataset in this study. In ANOVA jargon, a continuous dependent variable and a categorical independent variable are required, and categorical independent variables are referred to as factors. However, it is important to note that factor analysis and ANOVA are distinct statistical methods used to analyse data. Factor analysis is a data reduction technique that is used to uncover latent factors (unobserved variables that are underlying) within a dataset, while ANOVA is used to compare means across different groups.

4.3.1 Assumption checks

In this study, the questionnaire was used to measure students' level of environmental consciousness. Items from the revised New Environmental Paradigm (NEP) informed some of the items contained in the research questionnaire. The original NEP scale consists of 15 items measuring pro-environmental behaviour. The scale was published in 1978 and revised in 2000 due to the evolution of environmental problems. As such, the scale was adapted to include new items that were indicative of the emergence of global environmental problems that were causing major policy issues (Marcineková et al., 2024; Kopnina, 2012; Dunlap et al., 2000). The original scale included eight pro-environmental responses as well as anti-environmental responses. All the items of the scale were rated on a five-point Likert scale ranging from strongly agree to strongly disagree (Dunlap et al., 2000). The revised NEP has also been used in previous studies to measure environmental behaviour more broadly (going beyond only measuring pro-environmental behaviour). Moreover, the new scale consists of 15 items that have high internal consistency, validity, and reliability (Ikiriko, Anthony & Dawaye, 2023).

In this study, Question 9 in the online survey (see Appendix A) was similar to the original NEP scale. It was employed to measure participants' environmental attitudes and determine whether the participants displayed positive environmental behaviours. It also contained 15 items that measured environmental behaviour using a five-point Likert scale ranging from strongly agree to strongly disagree. The scale contained a mix of pro-environmental responses and anti-environmental responses. Although the NEP was developed some time ago, it is still relevant today. With this questionnaire context in mind, it is now important to discuss how the researcher went about assumption checking and determining the internal consistency, validity, and reliability of the questionnaire results.

Bartlett's Test of Sphericity

χ^2	df	p
6181	1081	< .001

The formula above illustrates Bartlett's Test of Sphericity[3] and its results. Bartlett's Test of Sphericity is a statistical test used to assess the suitability of data for factor analysis techniques. Barlett's Test of Sphericity helps a researcher to determine whether the correlation coefficients are all at 0. This is a prerequisite for factor analysis work as the test computes the probability of the correlation matrix to determine where it has significant correlations among some of the variables in the dataset. Furthermore, it provides information on whether the correlations in the data are strong enough to use dimension-reduction techniques like factor analysis. The rule of thumb for this test is for it to provide a significant chi-square output, which is the case as provided in the formula presented above (Shrestha, 2021). In the case of this study, the variable was significant.

With that said, it was essential for the researcher to check the reliability and validity of the data and to test the relationship between variables. Testing the reliability of the data refers to determining the degree to which the research method will produce consistent results; the reliability of the data is determined by measuring the internal consistency (Cooper & Schilder, 2012). A way to achieve this is through calculating Cronbach's alpha coefficients. According to Lowry and Gaskin (2014) and Fauzi (2022), Cronbach's alpha coefficients should be above 0.7 for items to be considered reliable. Cronbach's alpha is usually used on items that measure attitudes and behaviour, which goes beyond measuring the reliability and consistency of the data. The reliability analysis enabled the researcher to study the properties that measure scales and items that compose the scales. Furthermore, it calculated the number of commonly used scale measures to provide information about the relationships between the scale's items. In other words, the reliability analysis was used to measure the extent to which the items in the questionnaire were related to each other. Although there are several models that can be used to measure reliability (e.g., strict parallel, Guttman, and parallel), Cronbach's alpha (α) was used in this study as a measure of the internal consistency of the set of questionnaire items; it assisted in determining if the collection of items on the questionnaire measured the same characteristics by quantifying the level of agreement on a standardised scale of 0 to 1. There were five factor analysis scales for the study, and the results are presented in Table 4.2 below.

[3] Factor analysis is a statistical method that is used to identify underlying factors that explain patterns of correlations between a set of variables. It was used in this study to test an assumption of factor analysis. This assumption is that the correlation matrix of the variables is an identity index, which means that all the correlations between the variables are zero. In other words, Bartlett's test checks whether the variables are unrelated (independent) before factor analysis can be conducted and expand upon.

Questions 9.1 – 9.15 (Scale 1)	Cronbach's α
9.1 Of all the creatures on Earth, humans are the most important	0.745
9.2 Even if all other species/creatures on Earth disappear, human beings will still survive	0.736
9.3 I do not contribute to any of the environmental problems on Earth	0.756
9.4 I regularly think about the impact of my actions on the environment [a]	0.752
9.5 All forms of life – animals, plants, humans are equally important [a]	0.755
9.6 There are solutions for existing environmental problems [a]	0.756
9.7 Humans are NOT responsible for an environmental problem such as climate change	0.745
9.8 I am concerned about the environmental problems the planet faces [a]	0.732
9.9 South Africa has no environmental problems	0.743
9.10 There are unlimited natural resources in the world	0.757
9.11 Living a healthy life is more important than worrying about the environment	0.735
9.12 The natural environment will take care of itself	0.742
9.13 I am not concerned about the environment at all	0.734
9.14 Creating jobs is more important than preventing plant and animal species from extinction	0.731

9.15 In South Africa, land should be used for economic activities (such as farming and mining) rather than for conservation (such as nature reserves or national parks)	0.737
Reverse scaled item	
The item reliability of scale 1 is above 0.7 and it indicates a good index	0.757
Questions 10.1 – 10.5 (Scale 2)	**Cronbach's α**
10.1 People should be penalised for littering	0.421
10.2 Improving the quality of life is more important than spending money on the environment	0.456
10.3 Overpopulation is a contributing factor to all our environmental problems	0.399
10.4 There is no problem of overpopulation in South Africa [a]	0.374
10.5 Protecting the natural environment is important to increase the quality of life of people	0.416
The item reliability of scale 2 is 0.4 and it indicates a poor index as the values contained are low.	0.469
Questions 11.1 – 11.5 (Scale 3)	**Cronbach's α**
Question: How serious do you think the following environmental issues are in South Africa?	
11.1 Climate change	0.785
11.2 Land degradation	0.784

11.3 Loss of habitats	0.778
11.4 Air pollution	0.779
11.6 Deforestation	0.792
11.7 Water pollution	0.805
11.5 Water scarcity	0.823
The item reliability of scale 3 is 0.8 and it indicates a good index	0.818
Questions 13.1 – 13.4 (scale 4)	**Cronbach's α**
Question: Indicate for each of the following statements whether you personally would be prepared to partake in such a demonstration or not	
13.1 A political demonstration? (e.g. to protest against poor service delivery) Take part in public demonstrations to express concern	0.741
13.2 An economic demonstration? (e.g. protest against unemployment and job losses) Public demonstrations to express concern over a specific matter	0.782
13.3 An environmental demonstration? (e.g. protest against high levels of air or water pollution) Take part in public demonstrations to express concern	0.769
13.4 A human rights demonstration? (e.g. to promote the rights of women, children etc). Public demonstrations to express concern to call for change	0.784
The item reliability of scale 4 is 0.8 and it indicates a good index	0.816

Questions 14.1 – 14.16 (Scale 5)	**Cronbach's α**
Question: What are the most serious concerns in South Africa that require urgent attention from the government? Allocate a mark out of ten for each of the potential concerns: **Crime, domestic violence, poverty, unemployment, air pollution, freshwater shortages, problems with municipal service delivery, climate change, land redistribution, nature conservation, black economic empowerment, housing, undocumented migration, deforestation, economic growth, water pollution**	
The item reliability of scale 5	
N=	
The item reliability of scale 5 is 0.8 and it indicates a good index	0.879

Table 4.2 Summary of factor analysis results (reliability analysis of five scales)

Source: Own compilation

[a] reverse scaled item[4]

Table 4.2 above illustrates the reliability analysis findings of the five scales of the study. The scales are from questions 9, 10, 11, 13 and 14 and were taken from the online survey, where each of the statements contained in each question were measured to determine the internal consistency and the relationship between the variables.

According to Table 4.2 above, the variables from four scales all had a Cronbach's alpha value of between 0.60 and 0.80, indicating that the scales are very reliable, while scale 2 (Q10.1 – Q10.5) had a Cronbach alpha score of 0.4, thus indicating poor internal consistency. In other words, the items in each reliability analysis of the four scales indicated good indexes since they met the criteria for a good Cronbach's alpha coefficient. The items measuring environmental

[4] The "If item dropped"/ "reverse scaled item" shows how Cronbach's alpha of the question was removed from the test. This assisted with identifying items that were bringing down the overall reliability of the scale.

consciousness produced high Cronbach's alphas[5] indicating that the items agree and that the items are dependent on each other. The coefficient values provided in the results are indicative of a strong relationship between attitudes and behaviour. The items contained in the scales were, therefore, reliable.

4.3.2 Gaussian graphical model

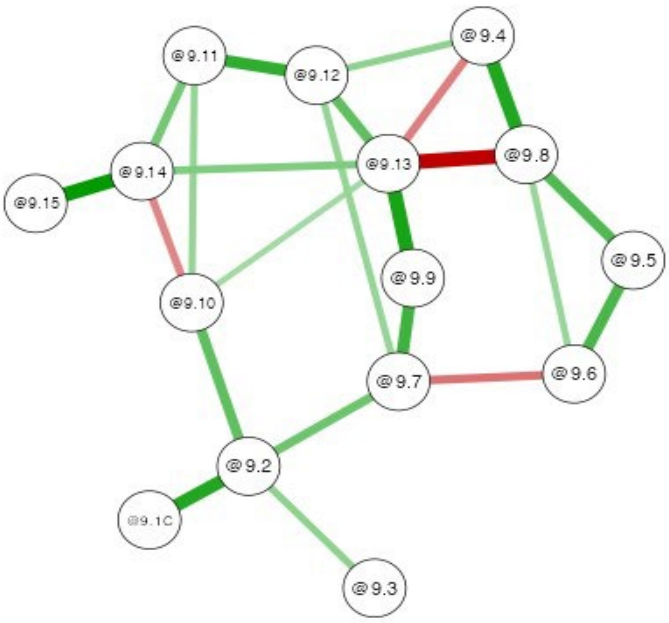


Figure 4.9 Gaussian graphical model

Source: own compilation

Figure 4.9 shows a Gaussian graphical model (GGM) illustrating the relationships among 15 Likert scale variables from question 9 of the online survey. GGM is a type of graphical model that uses nodes and edges to depict relationships between sets of variables. In the model above, the nodes (circles) represent the variables, while the edges represent the conditional dependencies between the variables 9.1 – 9.15. The green and red colours illustrate the relationship between the variables. An edge between the nodes indicates that the two variables are conditionally dependent on each other, considering all other variables. The absences of an edge between two nodes signify conditional independence. The thick lines connecting the circles between the statements on questions 9.8 ("I am very concerned about the environmental

[5] Cronbach's alpha ranges in value from 0 to 1. Any high values indicate greater reliability.

problems that the planet faces") and 9.13 ("I am not concerned about the environment at all") indicate that the two variables are statistically dependent on each other. Additionally, the figure shows a strong inverse relationship between 9.8 and 9.13 (thick red line). This means that the relationship between the variables is not statistically significant. However, there are positive strong relationships between 9.11 and 9.12; 9.15 and 9.14; 9.1 and 9.2; 9.13 and 9.9. Therefore, illustrating a statistically significant relationship between the variables. The figure presents the conditional dependencies between the variables. By examining the presence or absence of edges which determine which variables are related.

4.3.3 Eigenvalues of exploratory factor analysis (scree plot):

Figure 4.10 below is a scree plot illustrating the eigenvalues of the exploratory factor analysis of items 9 – 14 from the online survey.

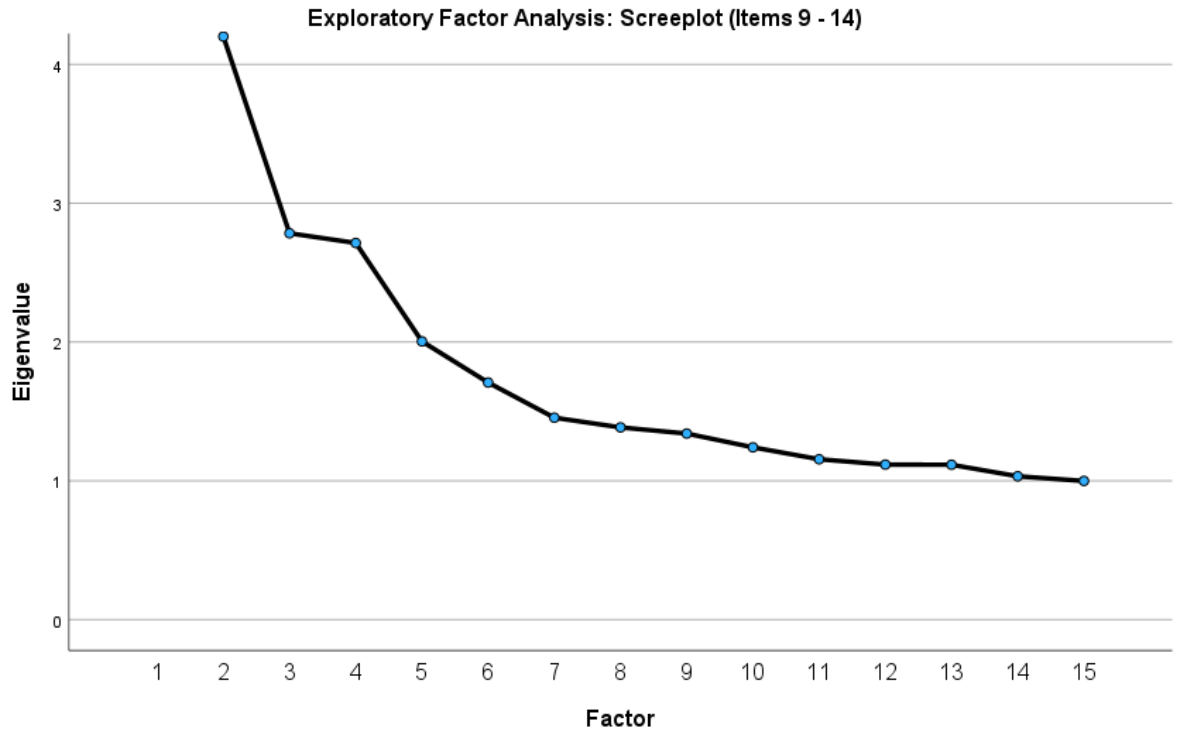


Figure 4.10 Eigenvalues of exploratory factor analysis (scree plot) (items 9 – 14)

(**Source:** Own compilation)

The scree plot[6] above illustrates the eigenvalues on the y-axis (referring to the amount of variation) and the factors on the x-axis (referring to the component numbers) in an exploratory

[6] The common rule of thumb is not to retain factors with eigenvalues that are greater than 1. A scree plot is a visualisation tool that helps to determine the number of factors retained in a factor analysis. Eigenvalues provide

factor analysis. It illustrates how much variation each principal component (PC) captures from the data. The graph measures eigenvalues against the corresponding PC number. Moreover, it determines the number of factors to retain an exploratory factor analysis (FA) or principal components to keep. The purpose was to retain numbers above the scree or where the plot tapers off gradually. As shown above, the rate of change is minimal as the "elbow" of the graph is where the eigenvalues drop from component one to component three. The scree plot, therefore, suggests that the three factors were sufficient in capturing important information in the dataset. FA was a data reduction technique used to find a way to reduce the data into smaller factors by analysing the intercorrelation groups existing in the data. It was important to reduce the data through factor analysis to determine the relationship between the variables.

Based on the results in Table 4.2, the alpha coefficients of four scales were high, thus indicating high consistency in the data, while scale 2 had low coefficients. The results that produced high coefficients illustrated the strong relationship between the variables on each item. Low coefficients illustrated that items were measuring other variables and not focusing on environmental behaviour. Overall, the factorisation illustrates the significance of the Likert scales contained in this study. The values contained in the factor analysis were statistically significant as the factor analysis was used to determine the underlying structure of the items on the scales and explain the interrelationship among the variables. The Cronbach's alpha of the scales was 0.745. The reliability statistics measured how likely it is that a question will be answered the same way each time it is asked. In other words, it measured the consistency of the questions. This is considered an acceptable level of reliability. Therefore, any values closer to 1 indicate greater internal consistency. Overall, Table 4.2 suggests that the scales have acceptable internal consistency. This means that the items on the scale with high Cronbach's alphas measured the same constructs (environmental attitudes and awareness). However, the items in questions 10.1 – 10.5 produced low coefficients, and this indicates that these questions did not measure the constructs (or environmental behaviour) as well as the other questions did. "Reverse scaled item" appeared on scales that contained low coefficients. The low coefficients show that there is poor interrelatedness between the items contained in the scale. This means that they are not measuring the same underlying construct. Therefore, there is a poor internal consistency within the questions, thus the reliability of the scale is low.

a representation of the scaling factor where a vector is transformed into a linear transformation applied. The importance of it is to illustrate where one can find a rate of change or to maintain the relationship between two variables.

4.4 Qualitative findings

The qualitative findings assisted the researcher in comprehending the complex insights provided by the participants. There were nine participants who took part in the mini groups. It was key for the researcher to profile the participants using some of the demographic information to attain saturation. The profiling was important to achieve a heterogeneous group of participants who would not provide the same information. Therefore, eight female participants and one male participant were selected. The faculties represented included the Humanities (n=2), Law (n=2), Economic and Management Sciences (n=2), and Natural and Agricultural Sciences (n=3), which was the largest group. When the researcher conducted the initial mini groups, the questions were grounded on pre-existing knowledge based on the results of the online survey. The nine participants provided insightful and versatile responses based on their experiences and worldviews. The critical criteria for selection were that participants needed to have completed the online survey before taking part in the mini group discussions. As they needed to have first completed the online survey and thereafter, express their interest to the researcher to participate in the mini group discussions.

The researcher followed a six-step process for thematic analysis. The technique employed enabled the researcher to work with coded information to identify common themes and insights as well as relationships between concepts across different transcripts. For analytic closure, the researcher reviewed the coded material and complemented it with notes that were taken during the interview process. Effectively, 11 of the questions posed during the mini groups mirrored some of the quantitative questions contained in the online survey, which all aligned with the central research question: how environmentally conscious are students? Table 4.3 below contains a summary of how the qualitative questions informed the research objectives.

Qualitative questions	Research objectives answered:
1. In the survey more than one-third of the respondents said that they believe human beings are the most important of all creatures on Earth. Please explain to me why you think so. Do you think other living creatures are of lesser value than humans? Why do you think so?	1. **(Q1, Q2, Q3)**
2. Some respondents said in the survey that humans will still survive even if all other species on Earth would disappear. Why do you think humans would be the only species to survive?	**(Q1, Q2, Q3)**
3. Almost one-third of the respondents in the survey indicated that planet Earth has unlimited natural resources. Can you explain to me why you think so?	**(Q1, Q2, Q3)**
4. Do you think you personally contribute towards the degradation of the environment? How?	**(Q1 – Q5)**
5. Do you think there are gender differences in perceptions of environmental issues?	**(Q5)**

6. In your opinion, who is mostly responsible for environmental problems in a) the world and b) South Africa?	**(Q2 & Q3)**
7. What do you regard as the most serious environmental problem in a) South Africa and b) the world? Why? How can we overcome this problem?	**(Q2 & Q4)**
8. If you think of humans and all the other living species in the world, which species do you think is the most important? Do you think we as humans can survive without any (or all) the other species?	**(Q1 & Q2)**
9. Where do you get information about environmental issues? (e.g., news, television, social media)	**(Q1 & Q4)**
10. Has your behaviour and attitude towards environmental issues changed over the years? How has it changed?	**(Q1, Q3 & Q5)**
11. Lastly, do you think human beings will still be around 300 years from now? Why do you think so?	**(Q2)**

Table 4.3 Summary of how qualitative questions informed the research objectives

Source: Own compilation

4.5 Thematic analysis

The researcher employed a six-step thematic analysis process as discussed in the preceding methodology chapter, Chapter 3, where Phase 1 (the pre-analysis) and Phase 2 (the material extraction) were outlined. The focus in this chapter is on Phase 3, the findings. In the box below are the initial codes generated in ATLAS.ti. Figure 4.11 is the thematic analysis map that was created. The identified themes were reviewed to determine the main themes and sub-themes.

Initial codes:

1. Environmental concerns
2. Environmental issues
3. Global affairs
4. Human-centric view
5. Societal impact
6. Society
7. Socio-economic factors
8. Sustainability

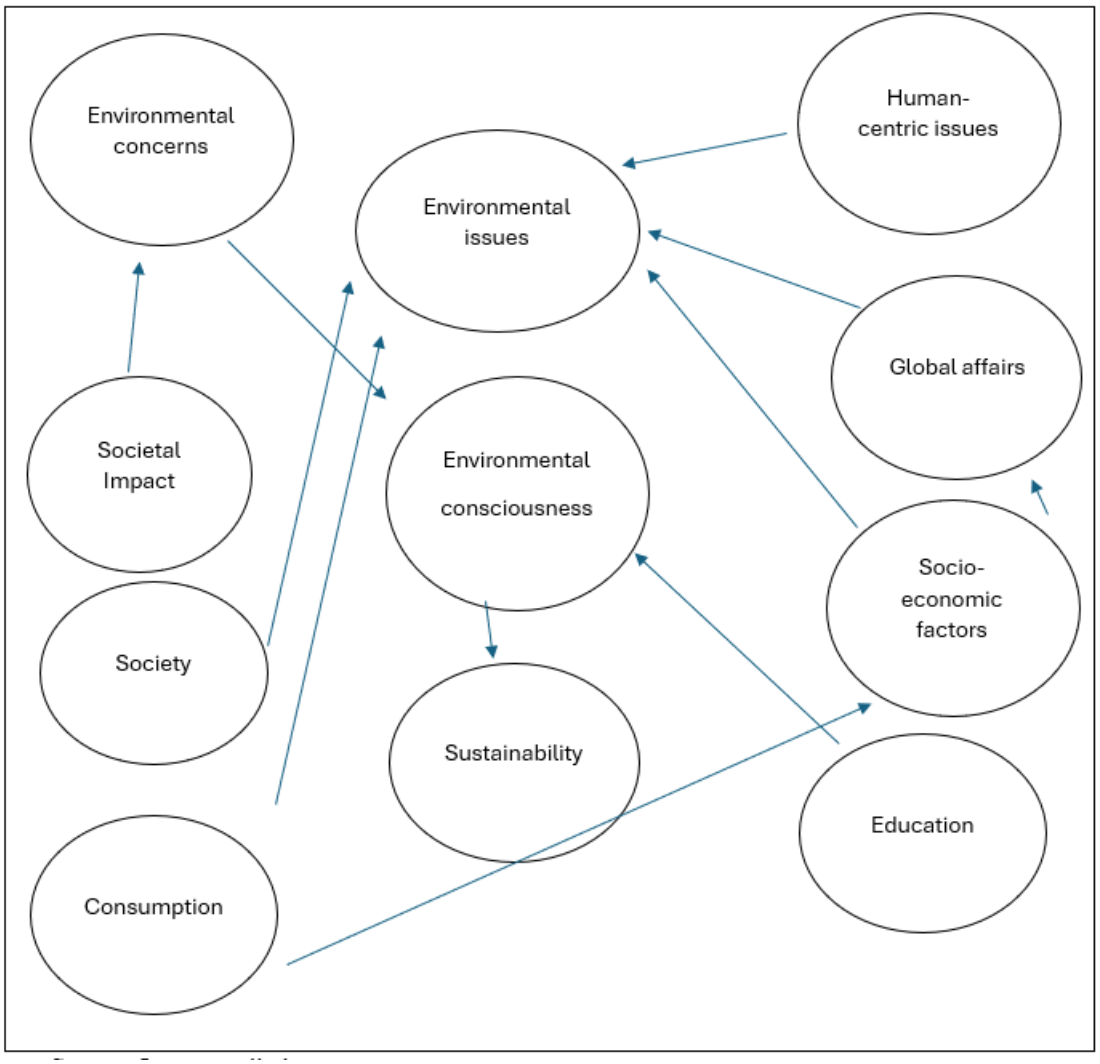


Figure 4.11 Thematic analysis map

Source: Own compilation

The thematic analysis map above (Figure 4.11) portrays the relationship between key terms taken from the qualitative dataset. Some of these terms became the themes of the study, as identified in the initial round of coding. Table 4.4 below provides a list of informative word frequencies taken from the qualitative data ranging from the highest frequency to the lowest frequency. Based on the word frequencies provided in the table below, the researcher was able to group the codes and identify the main themes of the study. The five key themes identified were environmental concern, environmental issues, gender, human consumption, and socio-economic factors.

Word:	Frequency:
1. issues	93
2. environmental	89
3. factors	42
4. global	39
5. existence	37
6. environment	35
7. pollution	32
8. social	32
9. conservation	29
10. change	25
11. responsibility	21
12. societal	19
13. information seeking	18
14. impact	17
15. significance	16
16. water	15
17. gender	15
18. carbon	14
19. perspective	14
20. air	13

21. sustainability	13
22. media	13
23. awareness	12
24. humans	12
25. countries	11
26. concerns	11
27. waste	11
28. species	10
29. resources	10
30. climate	9

Table 4.4 Informative word frequencies ranging from highest to lowest

Source: own compilation

The researcher also re-read the data to identify any nuances. This interrogative process further enabled the researcher to determine the depth of the data, which later enabled the presentation of the findings. The researcher clustered the responses according to findings that were similar to one another, and her interpretations of the data uncovered patterns and meanings that corresponded with the quantitative data. This correspondence allowed the researcher to verify what issues/themes had been mentioned and what had not.

The identified key themes (environmental concern, environmental issues, gender, human consumption, and socio-economic factors) answered the study's research objectives. The researcher employed inductive thematic analysis, and this enabled her to be flexible in drawing meaning from the data. Table 4.5 below contains the clustered codes that make up the identified themes. The codes and themes are accompanied by extracts from the qualitative data that informed each theme. The themes are discussed in more depth in the qualitative narrative in Section Two of this chapter (the next section). The qualitative narrative is structured according to the research objectives they address.

Codes:	Themes:	Extracts:
• Environmental concerns: environmental awareness • Human-centric worldview: survival of the fittest • Human-centric worldview: anthropocentrism • Sources of environmental issues • Importance of human beings • Environmental concern: ecosystems and sustainable living	Environmental concern	*I do think that human beings are the most important if you look at the scope of our planet and where we are.* *We are as human beings the most important because we have the ability to affect what happens so when it comes to climate change. We are the ones burning coal to create energy. We are the ones that decide not to use reusable energy. So as much as animals play a role, they don't necessarily make the choice to cause climate change or to cause global warming. That is why I say, we are the most important because we have the ability to make change.*
• Environmental concerns: misconceptions about natural resources • Climate change • Global warming	Environmental issues	*So let's say for example, China is overpopulated. Firstly, and it produces a lot of things that go on throughout the world. So even in South Africa, we have things that say made in*

• Impact of human actions • Overpopulation • Air pollution		*China, and that's it's like that. So, I think China is really a big factor when it comes to how much they produce and how much they send out because countries that export to other countries would most likely have a bigger carbon footprint because they have bigger factories, they have more people working in those factories.* *In South Africa, I think our government plays a really big role in in how things are because we could be using water as a way to produce electricity, but they choose to use coal. And as much as they say there isn't enough money for water there is a lot of times when money is spent on other things, because we've struggled with loadshedding, and we would not have loadshedding if we were using water as a way to make energy or if we're using wind as a way to make energy because water and*

		wind are both resources that are readily available. The only thing that we do not have is the equipment.
• Human-centric issues: personal responsibility • Gender roles • Human-centric worldview: gender disparities or preferences • Gender bias	Gender	*Not to generalise, women are naturally more conscious of what they do.* *Not that men don't care but they normally want the quick way out.*
• Sustainability • Sustainable energy • Fast fashion	Human consumption	*I do contribute and I think this because I use public transport. So that means pollution, air pollution, noise pollution, being on an aeroplane means air pollution. So, these are all the activities that I do in essence for survival, but to the detriment of the earth.*
• Global affairs • Societal impacts: job loss • Society • Education • Cycle of life and death • International cooperation	Socio-economic factors	*South Africa is a developing country. As much as there is pollution and everything going on in our country, I doubt that South Africa will be contributing so much to the environmental damage as compared to the most developed countries that*

• Government policies, advocacy, cooperation • Community involvement • Environmental sustainability • Socio-economic factors: pollution/ population density/ urban areas		*probably use their most recent technology available and they'll probably polluting the air more.* *The biggest manufacturers and contributors of environmental pollution is the developing countries because they're trying to catch up to the developed countries economically. So, they are working very hard to catch up. Like now the developed countries are more dependent on tertiary activities.*

Table 4.5 Identified codes converted into themes with data extracts

Source: Own compilation

Section 2: An exploration of environmental knowledge, awareness, and the determination of students' environmental perceptions

4.6 Environmental knowledge, awareness, and perceptions of respondents

This section reports the findings related to research Objectives One and Two. Table 4.6 below illustrates the percentage of the participant's responses to the 15-item Likert-type questions that aimed to determine the extent to which respondents agreed or disagreed with statements about the environment. The answer choices ranged from "strongly disagree" to "strongly agree". Different environmental statements were provided in the online survey that respondents could choose from (the numbers of the statements refer to the applicable response item in the questionnaire).

Statement	Strongly disagree (%)	Disagree (%)	Uncertain (%)	Agree (%)	Strongly agree (%)	N-value:
9.1 Of all the creatures on Earth, humans are the most important	19.0	26.7	10.1	27.2	16.9	415
9.2 Even if all other species/creatures on Earth disappear, human beings will still survive	39.3	24.1	22.7	9.4	4.6	415
9.3 I do not contribute to any of the environmental problems on Earth	22.0	47.6	14.3	11.1	5.1	414
9.4 I regularly think about the impact of my actions on the environment	5.8	10.8	10.6	51.3	21.4	415
9.5 All forms of life – animals, plants, humans –	7.0	7.7	5.8	29.0	50.5	414

are equally important						
9.6 There are solutions for existing environmental problems	2.9	3.1	13.0	52.9	28.0	414
9.7 Humans are NOT responsible for an environmental problem such as climate change	68.4	22.4	2.9	3.6	2.7	415
9.8 I am very concerned about the environmental problems that the planet faces	3.4	4.6	9.2	46.9	36.0	414
9.9 South Africa has no environmental problems	76.9	19.5	2.2	0.5	1.0	415
9.10 There are unlimited natural resources in the world	38.9	19.0	18.0	18.8	5.3	416
9.11 Living a healthy life is more important	27.4	47.6	16.6	6.0	2.4	416

than worrying about the environment						
9.12 The natural environment will take care of itself	41.3	40.1	10.6	6.5	1.4	416
9.13 I am not concerned about the environment at all	53.6	39.6	5.1	1.2	0.5	414
9.14 Creating jobs is more important than preventing plant and animal species from extinction	37.3	36.4	18.3	5.8	2.2	415
9.15 In South Africa, land should be used for economic activities (such as farming or mining) rather than for conservation (such as nature reserves or national parks)	24.2	36.2	20.5	11.8	7.2	414

Table 4.6 Perceptions about humankind's place in and relationship with the environment

The statement in Question 9.1, "Of all the creatures on Earth, humans are the most important", had the highest percentage of participant agreement (44.1% combined agree and strongly agree). Almost 46% disagreed with the statement posed in Question 9.1 (when combining the strongly disagree and the disagree responses). Although the majority of the participants disagreed with this statement, it is notable that so many agreed with this sentiment posed in the question since it shows that they hold an anthropocentric worldview that maintains that all forms of life are equally important. It is important to note that there is a relatively even split between respondents who agree and disagree but slightly more respondents who strongly disagree. Thus, this sentiment is one of the main findings of the study that will be analysed and discussed in the context of the theoretical framework in the next chapter. The statement posed in Question 9.2, "Even if all other species/creatures on Earth disappear, human beings will still survive", received a disagree response rate of 63.4% (when combining the strongly disagree and disagree categories), while 22.7% were uncertain about their response to the statement. In comparison, 14% of the respondents agreed with the statement (when the agree and strongly agree categories were combined).

Looking at the statement posed in Question 9.5, "All forms of life – animals, plants, humans – are equally important", 79.5% of the respondents agreed with the statement (again, when combining the agree and strongly agree responses), while 14.7% of the respondents disagreed with it (disagree and strongly disagree responses combined). When linking the previous finding discussed above with the finding of Question 9.5, there is a fairly even split between the responses to the question whether humans are the most important species. It appears that the majority of the respondents believe that all forms of life hold equal value. For Question 9.10, almost one-quarter of the respondents (24.1%) either agreed or strongly agreed that the planet has unlimited resources, while 18% of the respondents were uncertain. In comparison, 57.9% either disagreed or strongly disagreed with the statement. This finding is also further analysed in Chapter 5 since some sentiments represent the old Dominant World View and some contrasts with the NEP, while also ascribing to it. Therefore, the results show that the respondents hold a mix of beliefs from both paradigms.

For the statement, "In South Africa, land should be used for economic activities (such as farming or mining) rather than for conservation (such as nature reserves or national parks)", 60.8% of the respondents disagreed (disagree and strongly disagree responses combined),

while 20.5% were uncertain. Comparatively, 19% of the respondents either agreed or strongly agreed with the statement.

Overall, Table 4. 6 suggests that a high percentage of respondents are concerned about the state of the environment and are aware of environmental issues, while there are some respondents who are not. This sense of concern also determines their attitudes toward the environment. Despite this concern, however, there seems to be less consensus on the statement regarding the importance of humans compared to other creatures on Earth. There were also competing views about the relationship between humans and the environment. These views may influence how the respondents perceive the environment. These varying results illustrate how complex and multifaceted the human-nature relationship is (Stewart & Zaaiman, 2015). Next, Table 4.7 shows the results of the participants' responses to questions about their opinions on five statements about the environment and its link to quality of life (the numbers of the statements refer to the applicable response item in the questionnaire).

Statement	**Strongly disapprove (%)**	**Disapprove (%)**	**Uncertain (%)**	**Approve (%)**	**Strongly approve (%)**	**N-value**
10.1 People should be penalised for littering	2.4	2.7	4.8	42.5	47.7	414
10.2 Improving the quality of life of people is more important than spending money on the environment	10.9	37.4	27.5	16.9	7.2	414
10.3 Overpopulation	4.6	8.2	12.8	40.3	34.1	414

is a major contributing factor to all our environmental problems						
10.4 There is no problem of overpopulation in South Africa	43.0	30.4	15.9	6.3	4.3	414
10.5 Protecting the natural environment is important to increase the quality of life of people	1.2	2.7	8.0	36.0	52.1	411

Table 4.7 Perceptions about the relationship between the environment and quality of life

In the second statement (Question 10.2), "Improving the quality of life of people is more important than spending money on the environment", 24.1% of the participants (almost a quarter) agreed with the statement (i.e., either agreed or strongly agreed), while a high percentage of the participants, 27.5%, were uncertain of their response and 48.3% either disagreed or strongly disagreed with the statement.

Table 4.8 below provides a summary of the respondents' responses to statements aimed at exploring the respondents' perceptions of the seriousness of environmental issues in South Africa. The respondents needed to indicate how serious they thought a particular environmental issue was. The categories provided were very serious (VS); SS = slightly serious; U= uncertain; LS = less serious; NS = not serious at all; NH = never heard of the problem.

Environmental issue	Very serious (%)	Slightly serious (%)	Uncertain (%)	Less serious (%)	Not serious at all (%)	Never heard of the problem (%)	N-value
11.1 Climate change	62.7	27.7	4.3	4.3	0.5	0.5	415
11.2 Land degradation	60.4	22.0	13.0	2.9	1.2	0.5	414
11.3 Loss of habitats for animals and plants	59.8	24.1	8.7	5.8	1.2	0.5	415
11.4 Air pollution	68.2	21.2	4.8	3.6	1.4	0.7	415
11.5 Water scarcity	88.2	8.9	1.4	0.7	0.5	0.2	414
11.6 Deforestation	53.3	26.5	12.3	6.5	1.0	0.5	415
11.7 Water pollution	85.8	9.9	2.7	1.0	0.2	0.5	415

Table 4.8 Students' perceptions of the seriousness of local environmental issues

Table 4.8 above shows the percentage of responses to each item, which aimed to explore which environmental issues were serious in South Africa. A very serious environmental issue, as perceived by the respondents, was water scarcity. In response to this question, 88.2% of the respondents indicated that water scarcity is a very serious issue. This was closely followed by 85.8% who deemed water pollution as a very serious environmental issue. It is clear, therefore,

that the respondents deemed water-related problems in South Africa to be the most pressing environmental issue.

Land degradation and loss of plant and animal habitats were also rated as very serious environmental issues by most of the respondents (60.4% and 59.8%, respectively). Additionally, climate change (62.7%), air pollution (68.2%), and deforestation (53.3%) were all considered very serious environmental issues by the majority of the respondents. On the contrary, only 1% or fewer indicated that any of the listed environmental issues were not serious at all.

The researcher clustered a broader range of serious concerns – as selected by the respondents – into three categories (by ranking the responses from highest to lowest to determine the total proportion of the respondents and show the percentage equivalent for each of the categories). Figure 4.12 below provides an overview of how the respondents ranked the listed social concerns. The figure indicates that 78% of the listed concerns fell into the most serious category according to the participants (i.e., these concerns ranked 8 – 10 as the highest level of concern – see Table 4.9 below). These are most serious concerns in South Africa that require urgent attention from the government. Also indicated in the figure is that 20% of the concerns were considered moderately serious, falling into the ranking of 4 – 7 (see Table 4.9), while 2% of the concerns were categorised as not serious with a ranking of 1 – 3 (see Table 4.9**)**

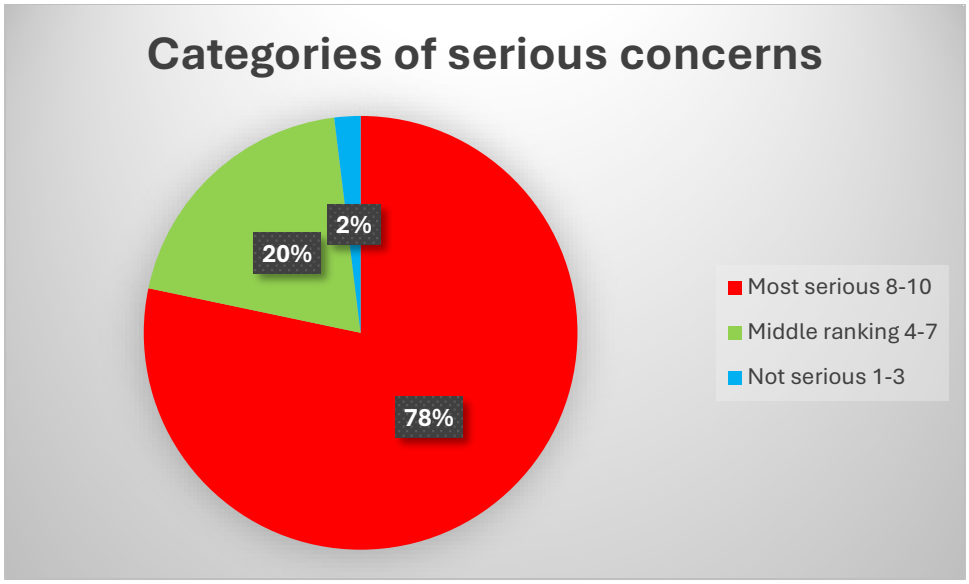


Figure 4.12 Three categories of clustered serious concerns

Table 4.9 below is an illustration of what respondents consider to be the most serious concerns in South Africa that require urgent attention from the government from the list that was provided containing social issues.

Categories of serious concerns (Highest to Lowest)	Most serious: 8-10 (%)	Middle ranking: 4-7 (%)	Not serious: 1-3 (%)	N-value
1. Unemployment	94.66	4.85	0.49	412
2. Crime	94.42	5.34	0.24	412
3. Domestic violence	93.45	6.07	0.49	412
4. Poverty	91.97	7.06	0.97	411
5. Problems with Municipal Service Delivery	88.56	10.46	0.97	411
6. Fresh water shortages	86.86	12.65	0.49	411
7. Economic growth	86.24	12.78	0.98	407
8. Water pollution	83.70	15.57	0.73	411
9. Housing	78.78	19.76	1.46	410
10. Undocumented migration	72.02	23.60	4.38	411
11. Black economic empowerment	69.27	25.61	5.12	410
12. Climate change	66.18	31.87	1.95	411
13. Nature conservation	65.61	31.95	2.44	410
14. Land redistribution	61.65	33.25	5.10	412
15 Air pollution	61.56	35.04	3.41	411
16. Deforestation	57.80	40.24	1.95	410

Table 4.9 Most serious concerns in South Africa according to respondents

Table 4.9 above illustrates the participants' ranking of the most serious concerns in South Africa as listed in the survey, which they believe require intervention from the government. Question 14 required respondents to rank the most serious concerns in South Africa that require urgent intervention from the government, where one was not serious and 10 extremely serious, requiring urgent attention. This question was provided to compare the participants' perceptions about the different social and environmental issues facing South Africa. The concerns are listed

in order from most serious (highest percentage) to least serious (lowest percentage). Here are the top five most serious concerns as selected by the participants in the table above:

- Unemployment (94.66%)
- Crime (94.42%)
- Domestic violence (93.45%)
- Poverty (91.97%)
- Problems with Municipal Service Delivery (88.56%)

Based on these findings, it is clear that the top five concerns were all socio-economically related; none of the listed environmental issues were listed as one of the top five concerns. The first environmental concern occupies the sixth position (water shortages). Therefore, it can be deduced that for these participants, environmental issues are considered to be lower-ranking concerns in South Africa (only occupying positions 12 – 16).

The findings mentioned above are notable because there seem to be societal issues that prevent South African youth from fully taking part in addressing environmental issues. This reluctance is despite the great potential South African youth hold. South African youth face social challenges such as unemployment, crime, poverty, and unequal educational opportunities in their daily lives. Indeed, most South African youth come from disadvantaged backgrounds with limited opportunities. The most pressing social issue South African youth are faced with is poverty (De Lannoy et al., 2018). Although the data above shows that unemployment is a more serious issues with poverty being the fourth most serious isse. The findings relating to what the respondents consider to be the most serious concerns in South Africa requiring urgent government intervention clarify why students (based on the study sample) rank the environment low in relation to other social problems. This finding is consistent with the findings of other studies indicating that there are competing social problems in South Africa that are regarded as more important than environmental problems (Meyer, 2018; De Wet-Billings, 2022).

In a diverse country like South Africa, there are several competing social issues, such as social inequality, poverty, and crime. Considering South Africa's history of inequality in access to education, services, and infrastructure, the country's priorities, as reflected in the National Development Plan, have been on social issues rather than environmental issues (De Wet-Billings, 2022). It is understandable that the country places more urgency on issues that warrant immediate attention. Based on the findings of this study, the researcher argues that many social

challenges in South Africa currently overshadow environmental interests and concerns. However, this illustrates that South Africa needs to invest more in enhancing positive environmental perceptions and attitudes.

4.7 Qualitative narrative

When analysing the results from the qualitative data, the researcher observed some similarities and differences with the quantitative data. There were eleven questions on the interview schedule of the mini groups, which aimed to measure participants' environmental behaviours, perceptions, knowledge, and actions toward the environment. Most of the questions followed up on questions presented in the online survey. The open-ended questions on the interview schedule encouraged the participants to reflect on their lives and experiences with the environment and environmental issues. The Theory of Planned Behaviour (TPB), an attitude-behaviour theory, was employed in this study. The use of this theory allowed the researcher to consider the participants' levels of environmental awareness and concern based on their personality traits, gender, and economic orientation to determine their environmental behaviour. Generally, a theory such as TPB is used to predict pro-environmental behaviour.

4.7.1 Theme one: environmental concern

Environmental concern was the first theme that emerged in the qualitative analyses. Most participants expressed that they have environmental concerns. The participants were required to express their views in response to the statement, "*Some respondents said in the survey that humans will still survive even if all other species on earth would disappear. Why do you think humans would be the only species to survive?"*.

The excerpts below are taken from the participants, verbatim responses:

> *I do think that human beings are the most important if you look at the scope of our planet and where we are. We are as human beings are the most important because we have the ability to affect what happens so when it comes to climate change. We are the ones burning coal to create energy. We are the ones that decide not to use reusable energy. So as much as animals play a role, they don't necessarily make the choice to cause climate change or to cause global warming. That is why I say, we are the most important because we have the ability to make change. I don't think that they are less of value because they do play an important part in making sure that all of us are alive. So, I think that humans are important, yes, but only because we can make the change.*

> *But I do believe that other organisms are also important because that's what provides us with food. Without them, we would not be able to exist. So, I believe that it should be like an equal level. So, we need to coexist with each other so that both species can survive (Participant 1).*

> *Don't get me wrong human beings are dependent on nature to thrive. That is the main reason. So, all creatures are equally important. I was going to say that we all play an important role so we cannot just say that human beings are the most important (Participant 7).*

Under the same theme, the participants were asked to provide their perspectives on whether they think human beings are the most important of all creatures. There were differing views among participants about the importance of humans. Two participants expressed the view that human beings are the most important when considering the scope of the planet. These participants believed human beings are important because of their ability to change things. For instance, humans burn coal to produce energy. Furthermore, they stated that humans have the ability to affect change through the decisions they make.

Similarly, in the quantitative findings, specifically for the statement presented Question 9.1, more than 44% of the respondents believed that humans are more important than any other creature on Earth. As mentioned earlier in this chapter, this sentiment contrasts with one of the main assumptions of the NEP. The findings from this study clearly show that there are competing views on the relationship between humans and the environment.

As mentioned previously, however, there were also some participants who acknowledged that although human beings can adapt to the environment, nature always has the upper hand. According to these participants, the environment and other species can function on their own without humans; humans are dependent on the environment for their survival. These participants also felt that those who agree that humans are the most important species have a misconception about nature. Furthermore, these participants cited the importance of the ecosystem and the interdependence of species. An ecosystem, according to the participants, highlights the significant role every kind of species assumes. Therefore, all species are equal as they form part of an ecosystem. This finding suggests that some participants are concerned

about the environment in some way. Below are two extracts from the data that evidence this finding:

> *Not only are humans important, we need to consider other factors such as animals, but personally I disagree with that statement. The ecosystem. I don't know how to describe it, but humans and animals are co-dependent. So, you can't really separate them and say this one is important and that one is not important. They all contribute somehow to our lives. That is my opinion. Definitely not, for example, mushrooms are one of the most important microorganisms in the entire world, without microorganisms in the soil, which is almost no one knows about them. We would not have healthy soil, we would not have trees, we would not have grass, animals pollinated (Participant 4).*

> *I have an understanding between what is meant by survive and what is meant by thrive. Survive is literally breathing and eating and thrive is to be healthy, because one can survive but to thrive that is the other thing. So, I also disagree with that statement. Just to add to what number one has said, she touches on the word thrive, I also want to add the word sustainability. If we are going to talk long term, from my side I disagree that humans can live until. I want to touch on the word sustainability because it is important to coexist with other animals. I don't know how to put it but it is important that we coexist. Thrive and sustainability to me (Participant 4).*

Participants were also asked to explain why they think humans would still survive without other species. All the participants said that humans cannot survive without other species. This question enabled the participants to reflect on the roles the environment fulfils. It is evident in their responses that they have environmental knowledge. Participants also reflected on the flow of the cycle of life, for instance, that trees are needed for oxygen. Again, participants mentioned the ecosystem and noted the independence of species on Earth. An example consistently cited was that of plants and how humans and animals live off them.

The question that measured the participants' environmental knowledge required them to indicate whether they think planet Earth has unlimited resources. Most participants disagreed with the statement and referenced water supply as an example. For instance, they stated that there is not enough water as ocean water cannot be consumed. Moreover, they noted that the majority of the Earth is covered by seawater. However, there were some participants who

agreed with the statement; the verbatim responses below are illustrative of the mix of participants' views regarding this question:

> *If you look you can see that we have unlimited water we have the ocean, but we can't drink ocean water. Eventually our water supplies are going to dry up if we don't have rain. In the end we will not be able to access water. When looking at oxygen, when they cut all of the trees down, we won't have oxygen because trees produce oxygen through photosynthesis. I do not think we have unlimited resources because not everything is permanent. Even humans die. So, like it's a cycle. Things are permanent for a certain amount of time, and then they die out. Thereafter, it will be up to us to build up trees again; we would need to wait for them to grow (Participant 1).*

> *Earth does not have an unlimited amount of resources. Yes, the whole planet is covered by 65% water, but the quality of that water is determined by the amount of pollution. So even though you have a set amount of resources, if you look at your non-renewable resources. We know that non- renewable resources are dissipating very quickly. Oil, coal that kind of thing. So just by the fact that we know that there are already things like load shedding lack of coal, oil prices, petrol prices going up that as a fact shows you that earth does not have an unlimited amount of resources (Participant 3).*

> *The way we use the resources, it all comes back to the point that we have limited resources and the challenges that we experience such as loadshedding shows that we do have limited resources (Participant 4).*

Some participants believed that there are limited natural resources since non-renewable resources are disappearing rapidly. These participants also indicated that people who believe there are unlimited natural resources think this because of a lack of knowledge. This finding thus highlights the need for humans to become aware of how natural resources are not in abundance because of humans' wasteful behaviours. The findings indicate that humans' increasing carbon footprint continues to strain the environment. Humans need to start looking for sustainable solutions to meet the primary needs of populations. Sustainable solutions should be thought of alongside creating jobs and ensuring that natural resources are not depleted in

the process for future generations. The quantitative results indicated that almost a quarter of the respondents agreed that the planet has unlimited resources.

The participants also reflected on their environmental behaviour and possible participation in environmental degradation. Some participants mentioned that they contribute to environmental degradation through air pollution, littering, noise pollution, and driving cars. The findings illustrate that all the participants' reflections on their environmental behaviour are attributed to human consumption.

The interview schedule ended with participants indicating whether they think humans will still be present around 300 years from now. Participants had mixed responses but generally thought that humans would still be present. They believed that humanity could reach that point and beyond through ever-evolving technology since humans have previously been able to devise solutions for pre-existing problems. Humans, nevertheless, need to undergo a conscientising process to better understand their own environmental behaviour so that they can take positive steps towards improving the environment.

The above discussion related to participants' responses that aligned with the first research objective: exploring their environmental knowledge, awareness, and perceptions. Additionally, the first research objective aimed to determine students' perceptions about the relative importance of global and local environmental issues.

4.7.2 Theme two: environmental issues

The second theme that emerged from the analysis was environmental issues. The participants focused more on discussing the most serious environmental issues in South Africa. Firstly, the participants regarded pollution as the most serious environmental issue when they reflected on who is responsible for environmental problems globally and in South Africa due to the manufacturing taking place in factories. Interestingly, the participants indicated that air and land pollution are more common environmental issues in South Africa. In addition, the findings indicated that people have normalised littering; people tend to merely discard waste without reflecting on their human behaviour. There was a strong link between social problems in South Africa and environmental issues. The participants, for example, raised the issue of protests; in attempting to cause disruption, protesters often throw cans and burn tyres, but these actions all contribute to pollution. Some participants regard deforestation as the most serious environmental issue. Generally, most participants believed that the main contributors to environmental problems are developed countries. They blame pollution on big corporations,

typically from developed countries, since production is continuous. According to the findings, however, manufacturing is rife in both developing and developed countries due to the level of primary and tertiary activities that take place, all of which cause damage to the environment. Below are some of the verbatim responses from participants:

> *I think pollution in general, like focusing on because South Africa is very dirty at the moment. And as much as we try and clean it up. There's a lot of funds that are not given to people that clean up our country. So, our country is very dirty and poor but beautiful and it shouldn't be like that. And I think in the world air pollution because we're constantly making something new. I think even with COVID is a lot of new things that were made. And factories are used for them to make them in bulk. So, masks are made in a factory. And that factory uses fuel to power the engines of the machines that they use and in turn that fuel creates some sort of smoke that needs to go out of the factory. So, air pollution I think in the world is one of the biggest issues we face and in South Africa, like littering, land pollution, that's what it's called. So yeah, that's my opinion (Participant 1).*

> *I'll touch on the world. Apart from air pollution also deforestation. particularly because I read somewhere that in the Amazon, they started to cut down trees to build something, to give that land to a certain company. So, you in as much as air pollution is an everyday thing. It's visible in the deforestation also has an impact on the climate right now. And then regarding South Africa, is literally it is a big problem and if you go to like a township, there is a river which is like a water source, and there's a house just one meter away from that. Right. So, if there's a flood for example, if maybe the sewer system isn't working, that house is going to get affected. It will demolish the house and the material on the house will go into the water in particular Participant 2).*

China was a country referred to due to the levels of production that take place there, including the manufacturing of fast fashion. However, participants also felt that developing countries like South Africa do contribute to pollution due to the primary activities of mining and agriculture. The discussion below addresses the fourth research objective, which aimed to explore any possible correlation between students' perceptions of environmental issues and their socio-

demographic attributes. Participants provided information about how their behaviour towards environmental issues has changed and what informed the change.

4.7.3 Theme three: gender

Gender was the third theme that emerged from the data. The researcher observed dissenting views among the participants regarding the link between gender differences and environmental issues. Some participants expressed that women are more conscious about environmental issues than men by referring to household matters in order to come to this conclusion. Reflecting on socialisation theory outlined when discussing the quantitative findings, the researcher believes that there are indeed gender differences regarding environmental perceptions. In other words, the researcher argues that the female participants were more drawn to the subject matter under investigation than their male counterparts. Some participants, however, did not believe that there are gender differences when it comes to being cognisant of environmental issues. One participant, for example, stated that men contribute to pollution through the production of carbon monoxide, while women contribute to pollution through their use of disposable baby nappies. These participants believed that everyone contributes equally to environmental issues. Below are some of the verbatim responses from participants:

> *Not to generalise, women are naturally more conscious of what they do. Because let's say for example, in our household, my mom does the groceries, so she knows that when she goes grocery shopping, she needs to take the reusable bags to go shopping. But when my dad does it for example, he will just say, why are we taking this, this is a lot of effort. Let's rather buy more plastics. So, I do think that women are a bit more conscious because at the end of the day, it's creating an environment where your children's children and their children will still be here. So, they don't think of this just the now. They think of the generations to come as well. That's why I think women are just a bit more cautious of what they do. Not that men don't care but they normally want the quick way out (Participant 1).*

> *It goes with the way we were brought up. I'm going to be very controversial. I think that to a certain extent it can be put to gender differences. In a typical home. boys are raised to be very carefree about life. They don't really take much responsibility for themselves and their surroundings. You find that more often than not parents pick up their things after them. Parents cuddle them and they are more protected even in their lack of*

> *awareness. When it comes to females, girls are thought from an incredibly early age to take care of themselves and their surroundings, the environment and their family. So, by virtue of that indoctrination, they are more aware to do the things that are more nurturing, more protective. So, a girl will most likely be told to pick up after their brothers. Girls would rather be shouted at for being messy. So, at the back of our minds, whether we are in the house or outside, we are most likely to be more nurturing towards our immediate environment. So that means being cleaner, being aware of the environment. So, I think in that sense, there is a gender difference in how we perceive the environment (Participant 9).*

The above data evidences how important it is for researchers to become familiar with what and how people get information about environmental issues. Where people acquire environmental information is essential because that informs their level of environmental consciousness. The findings illustrate that the participants' knowledge about environmental issues is informed by various sources. Most of the participants cited social media and television as their sources of information regarding environmental issues, which illustrates the power the media plays in disseminating information. A few participants cited scientific and academic journals, since they conduct research about environmental issues and stresses in their respective disciplines.

4.7.4 Themes four and five: human consumption and socio-economic factors

The fourth theme that emerged consistently from the qualitative data was human consumption. This theme has been coupled with the fifth theme, socio-economic factors. Some respondents indicated that most environmental issues are attributed to people's lifestyles. The participants conceded that they personally contribute to the degradation of the environment. Again, the participants reflected on their environmental behaviour; this time, they reflected on the size of their carbon footprint made by using fuelled vehicles as opposed to electric cars. Some of the participants expressed that their lifestyles contribute to environmental degradation and that they could not downgrade their lifestyles to be environmentally friendly. Some of the participants indicated that they use public transport, which they believe contributes to air and noise pollution and is, therefore, detrimental to the environment. Another aspect that contributes to environmental degradation, according to the participants, is the use of plastic and plastic water bottles.

Here are some of the verbatim responses:

I feel like that contributes to air pollution because it puts out toxins into the into the atmosphere and that in turn, contributes to land degradation. So, I do believe that yes, I do play a role in the degradation of our land. I tried to not litter because I believe that Littering is just wrong. And you can't just throw out your things. Because it was a thing like plastics. I think we at home really try to reuse the plastics that we buy at like shopping centers. And then we also try to use like those bags that are usable. So as much as yes, I do somehow contribute to land degradation. I think. We also try to find ways to curb the carbon footprint by not buying new plastics every time but reusing ones (Participant 1).

By driving my car to work, by not recycling every single thing that I use. By flushing a toilet 5 times a day. It's almost, you know, you're responsible for these things. It is some of them are easier to change than others. But it does. Products that you decide to purchase in a shop that is recycled how much of it is sustainable? (Participant 3).

I think that I do contribute to the degradation of the environment. I don't recycle anything. But how? For instance, I saw an article or something that I was reading on social media, where they were talking about how airplanes and helicopters cause air pollution and stuff like that. And then I thought about it like, if I have to go to Johannesburg, can't I just use a bike then I think let me just book a flight. So, there are always alternatives, but I always choose the convenient one. They said more or less everything. I also contribute like you know how we are supposed to recycle our bottles. And then I just use them twice and then it goes into the bin without keeping it any longer. I want to ask which bottles do you throw out? It is those Aquelle bottles or plastic bottles. I'm supposed to recycle them and put them in a separate bag. Or maybe reuse it or put it in one bag and put it in the dustbin. Do you ever think about where does that waste go? To a dumpsite obviously but beyond that I do not know. You know Checkers, those brown paper bags, there is like a sticker on it that says recycle and if you buy again, you must give it to the driver. I never read the sticker (Participant 7).

The findings indicate participants' feelings that the main contributors to environmental problems are big corporations, as mentioned previously, too. Some of the participants even

stated that there is a need for government regulation to control manufacturing and consumption since they believe most of the manufacturing globally has been taking place at the expense of the environment.

In essence, the responses provided by the participants provided versatile insights into the topic at hand. The attitude of participants towards certain environmental actions was evident in the behaviours they expressed when talking more about their life experiences.

Section 3: The environmental attitudes and behaviours of respondents and the exploration of correlations between environmental perceptions and environmental issues.

Figure 4.13 below illustrates the responses of the participants, indicating whether they have personally taken part in any protest with the purpose of having an environmental issue addressed by authorities. In section two, environmental knowledge, awareness and perceptions were addressed. In this section, the focus will be on environmental attitudes and behaviours.

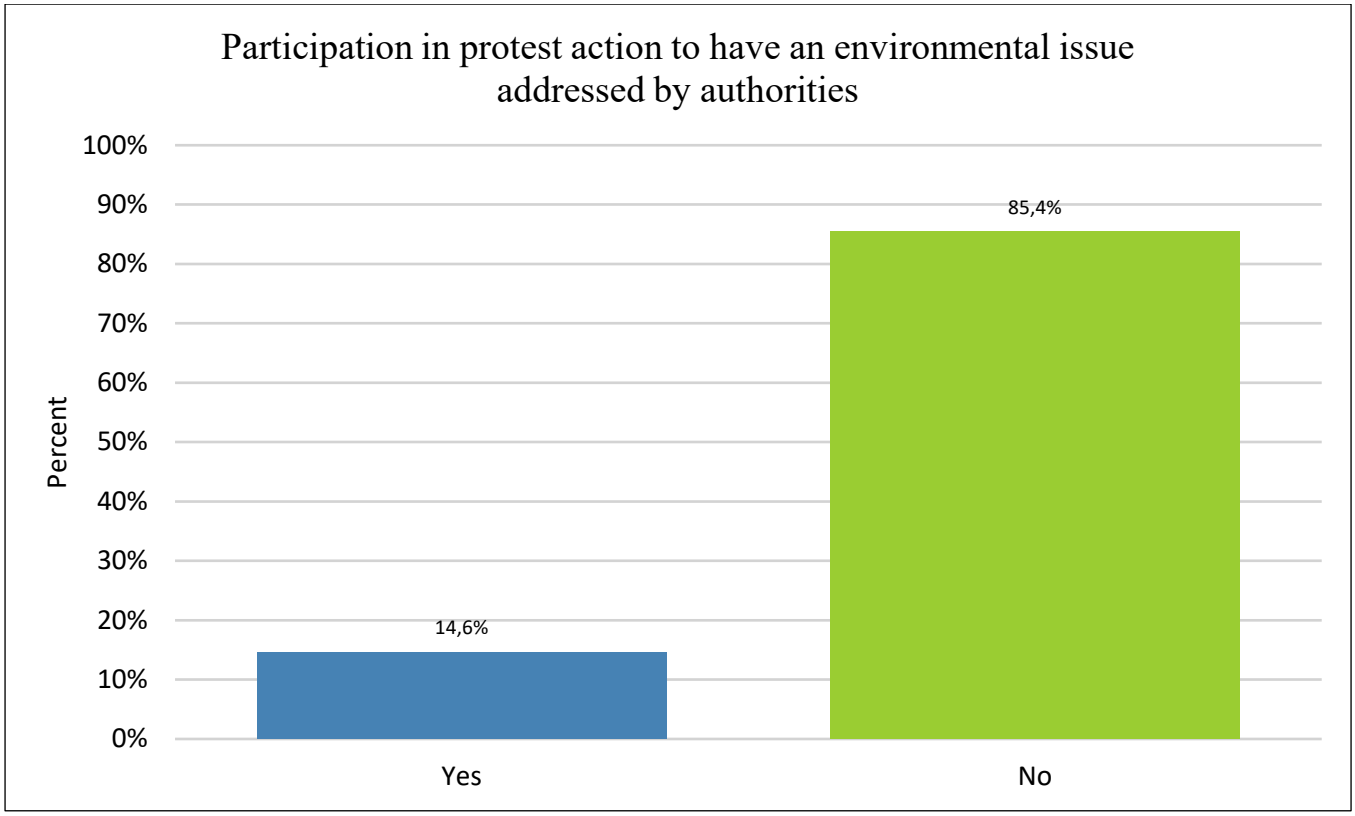


Figure 4.13 Participation of respondents in protest action to address an environmental issue

Figure 4.13 illustrates how the majority of respondents (85.4%) responded that they had not participated in protest action to have an environmental issue addressed by authorities. Only 14.6% said that they had participated in protest action to have an environmental issue addressed by authorities. The majority of the 'no' (85.4%) responses indicate that there is a need for environmental perceptions to change. This is attributed to the nature of protests (protests about the socioeconomic inequalities) in South Africa, as the country has been referred to as the capital of protests (Roberts et al., 2017; Richardson et al., 2022). Students have progressively been making their voices heard. However, their focus often tends to be concentrated on social issues – fees as well as other issues, such as the digital divide, unemployment, and food security. Literature shows that there are low levels of concern and willingness to participate in environmental protests in South Africa (Prendergast et al., 2021). The waves and cycles of protestation without resolutions in the country have made it obvious that students struggle with many issues that have been boiling under the surface.

Table 4.10 below illustrates the responses of respondents indicating whether they would take part in a public demonstration to express concern over a specific matter in society or to call for action or change. The respondents were provided with four types of public demonstrations from which they could choose.

Taking part in public demonstrations is a popular way to express concern over a specific matter in society towards a call for action or change. Indicate for each of the following statements whether you personally would be prepared to partake in such a demonstration or not	**Yes**	**No**	**Prefer not to say**	**N-value**
13.1 A political demonstration? (e.g. to protest against poor service delivery)	52.4	32.0	15.5	412
13.2 An economic demonstration? (e.g. protest unemployment and job losses)	56.2	30.9	12.9	411
13.3 An environmental demonstration? (e.g. to protest against high levels of air or water pollution)	60.5	29.3	10.2	410
13.4 A human rights demonstration? (e.g. to promote the rights of women, children etc.)	72.4	18.3	9.3	410

Table 4.10 Environmental attitudes and actions of students taking part in a public demonstration

Table 4.10 illustrates the responses to the online survey questionnaire (Question 13) that asked respondents whether they would personally be prepared to take part in public demonstrations to express concern over a specific matter in society or make a call for action or change. This question aimed to explore the respondents' environmental attitudes, actions, and willingness to protect the environment. The answer choices were 'yes', 'no' and 'prefer not to say'. Table 4.10 illustrates the four categories of demonstration from which the respondents could choose: political, economic, environmental, and human rights. Each category in the table illustrates the percentage of respondents who responded 'yes', 'no' or 'prefer not to say', along with the total number of respondents for each category.

For political demonstrations, 52.4% of respondents selected 'yes' to illustrate their willingness to participate in such demonstrations, while 32.0% of the respondents selected 'no', and 15.5% selected 'prefer not to say'. In total, there were 412 responses in this category. For economic demonstrations, 56.2% of the respondents said 'yes', they would participate, while 30.9% of the respondents said 'no', they would not, and 12.9% said that they 'prefer not to say'. There were 411 responses in this category. For environmental demonstrations, 60.5% of the respondents said 'yes', they would participate, while 29.3% of the respondents said 'no' they would not, and 10.2% said they would prefer not to say. Yet only 14.6% of respondents have participated in protest actions around environmental concerns (as discussed under Figure 4.13) There were 410 responses in this category. Finally, for human rights demonstrations, 72.4% of the respondents said 'yes', they would participate, while 18.3% of the respondents said 'no', and 9.3% said they would prefer not to say. There were 410 responses in this category.

4.9 Chi-square results

This section illustrates the results of the chi-square test of only the statistically significant correlations ($p < 0.05$) of the study. Some of the responses were re-coded to remove cells that contained low values, and some categories were combined.

Improving the quality of life of people is more important than spending money on the environment	**Gender**			
	Female		**Male**	
	N	**%**	**N**	**%**
Disagree	271	77.7	74	63.8
Uncertain	45	15.4	20	17.2
Agree	20	6.8	22	19.0
Total	**292**	**100**	**116**	**100**

Table 4.11 Female and male responses to the statement "Improving the quality of life of people is more important than spending money on the environment"

P= 0.001

Table 4.11 above illustrates the percentage of the participants who spend money on the environment, broken down according to gender. The female respondents (77.7%) were more inclined than the male respondents (63.8%) to feel that improving the quality of people's lives is not more important than spending money on the environment. The male respondents (19%) were thus more inclined than their female counterparts (6.8%) to agree with the statement.

People should be penalised for littering	**Gender**			
	Female		**Male**	
	N	**%**	**N**	**%**
Disagree	8	2.7	13	11.2
Uncertain	10	3.4	10	8.6
Agree	274	93.8	93	80.2
Total	**292**	**100**	**116**	**100**

Table 4.12 Gender and responses to the statement "Q10.1 People should be penalised for littering"

P= 0.001

Table 4.12 above illustrates the respondents' responses to the statement "people should be penalised for littering", broken down by gender. The female respondents (93.8%) were more inclined than the males (80.2%) to agree that people should be penalised for littering. The male respondents (11.2%) were thus more inclined than the females (2.7%) to disagree with the statement.

Over population is a major contributing factor to all our environmental problems	**Gender**			
	Female		**Male**	
	N	**%**	**N**	**%**
Disagree	24	8.2	26	22.4
Uncertain	36	12.3	17	14.7
Agree	232	79.5	73	62.9
Total	**292**	**100**	**116**	**100**

Table 4.13 Gender and the responses to the statement "Overpopulation is a major contributing factor to all our environmental problems".

P= 0.001

Table 4.13 above illustrates the respondents' responses to the statement "overpopulation is a major contributing factor to all our environmental problems" broken down by gender. The female respondents (79.5%) were proportionately more inclined than their male counterparts (62.9%) to agree that overpopulation is a major contributing factor to all our environmental problems. The male respondents (22.4%) were thus more inclined than the females (8.2%) to disagree with the statement.

There is no problem of overpopulation in South Africa	**Gender**			
	Female		**Male**	
	N	**%**	**N**	**%**
Disagree	227	77.7	74	63.8
Uncertain	45	15.4	20	17.2
Agree	20	6.8	22	19.0
Total	**292**	**100**	**116**	**100**

Table 4.14 Gender and the responses to the statement "There is no problem of overpopulation in South Africa"

P= 0.001

Table 4.14 above illustrates the respondents' responses to the statement, "there is no problem of overpopulation in South Africa" broken down by gender. The female respondents were more inclined (77.7%) than the males (63.8%) to disagree with the statement. The data suggests that females are more environmentally aware about certain environmental issues and caring for the planet than males.

4.10 Conclusion

This chapter discussed the results of the study. The biographical information provided indicated that there were more females than males who participated in the study. Additionally, more respondents were from the faculty of the Humanities. In terms of ethnicity, there were more black respondents than white respondents. The biographical results provide an added layer of perspective on some of the links between the biographical features of the respondents (e.g., gender, ethnicity, and where respondents mostly grew up) and their and environmental perceptions and attitudes. The respondents were also required to provide information about their socio-economic position; most of the participants fell in the 5th socio-economic category (i.e., in the middle of the socio-economic spectrum). This result shows a normal distribution, meaning that the data was symmetrically distributed (as shown by the bell shape on Figure 4.8 illustration the socio-economic status of respondents).

The reliability analyses represented by the five scales provided earlier in the chapter 4 evidenced the high alpha coefficients produced by the results. The high alpha coefficients indicate the consistency and reliability of the data, and they illustrate the strong relationship between the variables in each item. These statistics mean that items with high coefficients measured the same constructs (environmental attitudes and awareness).

The items in Questions 10.1 – 10.5 (in Table 4.2) produced low coefficients, illustrating that the items were measuring other variables and not focusing on environmental behaviour. Overall, however, Table 4.2, which illustrates the reliability analysis of the scales in Questions 9 – 14.16, suggests that, except for Scale 2 (Questions 10.1 – 10.5) the scales have a great internal consistency. The Gaussian Graphical Model was provided as it depicts the relationship between the set of 15 variables contained in Question 9 (i.e., the Likert scale questions) and highlights which variables were statistically dependent on each other. Moreover, a scree plot was provided containing the eigenvalues of the exploratory factor analysis, showing which three factors were retained in the dataset.

Section one ends with the introductory part of the qualitative findings where the remaining steps of the thematic analysis were discussed. In this section, the thematic analysis map was provided, and the initial codes were outlined to assist with the identification of the five themes: environmental concern, environmental issues, gender, human consumption, and socio-economic conditions.

Section two focused on two of the study's research objectives: exploring environmental knowledge and awareness, and determining students' environmental perceptions. Furthermore, section two discusses the results of the Likert scale for Question 9 (for the purposes of reporting, the 'agree' and 'strongly agree' responses provided in the online survey were combined as were the 'disagree' and 'strongly disagree' options). The main findings of the study were identified in this section. The first main finding was taken from Question 9.1, where 44.1% of the respondents agreed that humans are more important than any other creature, which is a sentiment that contrasts with the assumptions of the New Environmental Paradigm. Additionally, 46% respondents disagreed with the statement, showing closer alignment with the values of the NEP. Another interesting finding emerged from Question 9.2. in which 63.4% of the respondents agreed that "Even if all other species/creatures on Earth disappear, human beings will still survive". Yet another noteworthy finding emerged from Question 9.5 for which 79.5% of the respondents agreed that "All forms of life – animals, plants, humans – are equally

important". Some participants indicated that all species are equal as they are all part of an ecosystem. A final interesting finding emerged from Question 14 for which the respondents were asked to indicate what they considered to be the most serious concern in South Africa requiring urgent government intervention. The findings revealed that the top three concerns were unemployment, crime, and domestic violence. When looking at other concerns, environmental issues were ranked lower or not deemed to be serious concerns. However, water scarcity was ranked 6th, while other environmental issues were ranked at the bottom of the list, as water stood out as an important concern for respondents.

A trend in the data, as observed by the researcher, was that participants had competing and mixed perceptions about the environment, evidencing the fact that the human-nature relationship is complex. The respondents clearly had different attitudes towards the environment, while still being aware of environmental issues. Five themes emerged from the qualitative results, and the qualitative narrative provided in section two supplemented the qualitative results to enhance the rigour of the study. The findings from the qualitative part of the study either complemented or contrasted the quantitative findings.

Finally, section three addressed the remaining two research objectives: to ascertain what the respondents' environmental attitudes and behaviours were, and to explore the relationship between environmental perceptions and environmental issues. This was the shortest section of the chapter, and it provided the chi-square test results and the interpretations of the questions that had statistically significant correlations ($p < 0.05$) of the study. Question 12 required the respondents to indicate whether they have ever personally taken part in any protest action to have an environmental issue addressed by authorities. The majority of the respondents (85.4%) said no, they had not taken part in a demonstration, while 14.6% of the respondents said yes, they had. Another noteworthy finding from this section was from Question 13, which revealed that 60.5% of the respondents would participate in an environmental demonstration, while 72.4% respondents would participate in a human rights demonstration. Based on the two findings about public demonstrations, the researcher concludes that there is a need for people's perceptions about protecting the environment to change.

Concerning the Chi-square results, only the statistically significant correlations ($p < 0.05$) were reported, and some of the cells were re-coded. The findings revealed that the female respondents were more inclined than the males to disagree that improving people's quality of life is more important than spending money on the environment. This was true for the question

about littering, where more female respondents agreed that people should be penalised for littering. It is, therefore, clear from the Chi-square results that there are differences in the ways the two genders responded to the questions.

The findings of this study and their integration with the empirical information will be discussed in Chapter 5. Evidently, the findings of this study are complex and versatile. In some instances, they are consistent with some of the findings from previous studies, but there is clearly still room for future research and further development in the field.

Chapter 5: Discussion and Interpretation

5.1 Introduction

In the previous chapter, Chapter 4, the findings of the study were presented. Chapter 5 discusses and interprets the main findings of the study relating to the environmental consciousness of students at the University of the Free State (UFS). The purpose of this chapter's discussion is to derive meaning from the study's results. By following a mixed methods approach, this study aimed to advance our sociological understanding of environmental issues, students' environmental behaviour, and the factors that influence them. The research approach also enabled the researcher to explore different environmental perspectives to help bridge the knowledge gap about environmental consciousness. In order to achieve these multiple aims, two theoretical frameworks were employed, and the researcher borrowed insights from sociology by employing the constructs of the New Environmental Paradigm and from social psychology by employing four constructs from the Theory of Planned Behaviour to inform the findings of the study.

In the discussion below, the researcher demonstrates how the quantitative analysis was complemented by qualitative analysis. The study's research findings have been integrated by synthesising the information from both sets of data into a coherent and insightful analysis. In integrating the findings, the researcher compared the responses from the online survey and the different themes that arose from the in-depth mini group transcripts to create a complex mixed methods design. In this way, the researcher was able to marry the datasets empirically. The researcher triangulated the findings by comparing the quantitative and qualitative findings that complemented or contrasted each other to enrich the interpretation of the data.

The chapter starts with a discussion of the main findings, environmental consciousness, and the theoretical implications of the study for the study context. The discussion is delineated into four sections according to how each of the research objectives has been addressed. The first section focuses on Research Objective One, i.e., exploring participants' environmental knowledge, awareness, and perceptions. Also discussed, are the findings related to the importance of humans to other creatures on Earth and the Earth's limited resources. The second section focuses on Research Objective Two, which is concerned with participants' perceptions of the relative importance of global and local environmental issues. Section three focuses on Research Objective Three, which aimed to explore participants' environmental attitudes and

actions, as well as their willingness to protect the environment. Lastly, section four focuses on the correlation between participants' perceptions of environmental issues and their socio-demographic attributes.

5.2 Respondents' environmental knowledge, awareness, and perceptions (Research Objective 1)

5.2.1 The importance of humans to other creatures

The quantitative results show that 44.1% of the respondents (when the agree and strongly agree responses are combined) indicated that they believe humans are the most important creatures on Earth. This finding supports the assumption of the Dominant Western Worldview (DWW), which is human-focused. This worldview sees humans as fundamentally different from other creatures and, therefore, as having dominance over them. The DWW was supported by the Human Exemptionalism Paradigm (HEP), which posits that humans have a cultural heritage, thus making them different from other species.

The qualitative findings indicate that some participants agreed that humans are the most important species since they can effect change and can create energy by burning coal. Furthermore, the participants believed humans are crucial for the Earth because of their ability to make a difference in issues like climate change while also recognising the importance of other living beings in sustaining life. The participants also thought that humans are the most important species on Earth because humans can affect change through the choices they make and through the impact those choices have on the environment. This is another sentiment that supports the DWW, which believes that humans are the masters of their destiny as they can choose their goals and learn how to achieve them. Below are some of the responses provided by the participants:

> *We as human beings are the most important because we can affect what happens so when it comes to climate change. We are the ones burning coal to create energy. We are the ones who decide not to use reusable energy. So as much as animals play a role, they don't necessarily choose to cause climate change or to cause global warming. That is why I say, we are the most important because we can make change (Participant 1).*

> *I also feel as though we learned how to master using our hands. So, because we know how to use our hands effectively (Participant 2).*

The finding about humans being the most important species on Earth is contrary to one of the assumptions of the NEP, namely that all forms of life are equally important. The anthropogenic worldview of some of the participants contrasts with the belief that humans are one among many species functioning interdependently with the global ecosystem. When combining the statistics from the disagree and strongly disagree statements, almost 46% of the respondents disagreed that of all the creatures on Earth, humans are the most important, and 10.1% of the respondents were uncertain. While slightly more respondents disagreed that humans are the most important creatures, the qualitative data provides evidence that the HEP is still reflected in the participants' responses to the interview questions.

The proportion of respondents who disagreed with the statement complements the qualitative findings. The qualitative findings show that some participants expressed that humans depend on nature for survival. Most participants believed that humans are not the most important creatures on Earth, as every species plays a significant role in the ecosystem. They did not think that humans would be the only species to survive if all others disappeared since humans depend on other species for survival (e.g., for food and sustenance). However, a few participants thought that humans are the most important species because they believed that humans can affect change by their choices and impact on the environment. Still others stated that animals are more important than humans, as animals can survive without humans. Overall, the participants did seem to agree on the necessity of the coexistence of animals and plants for human survival since every species plays a significant role in the ecosystem. Below are some of the responses provided by the participants.

> *Don't get me wrong human beings are dependent on nature to thrive. That is the main reason. So, all creatures are equally important. I was going to say that we all play an important role so we cannot just say that human beings are the most important (Participant 7).*

> *Well, not necessarily because by virtue of that, we think that we are the only species that matter in this world. I feel like the thing with an ecosystem is that every kind of specie plays a significant role. So, we are not the most important in this world or this environment but because, we are gifted with the cognitive functions and skills that advance certain things in this world. A lot of people might deem it that way, but I feel*

> *that to a certain extent we are all equal because we form part of an ecosystem and with one change in that ecosystem, things will fall apart (Participant 9).*

The findings discussed above do, however, indicate the existence of some conflicting views among the participants about how they perceive the environment.

Furthermore, the respondents were required to indicate whether they believed that, even if all other species or creatures on Earth disappeared, humans would still survive. Of the combined disagree and strongly disagree responses, 63.4% of the respondents disagreed with this statement, while 22.7% were uncertain, and 14% agreed overall. The qualitative findings also show general agreement that there is co-dependency among species. The participants did not believe that humans would survive without other species of animal and plant. For example, the participants indicated that for humans to breathe, they need oxygen, which comes from trees, plants, and the ozone layer that forms part of the Earth's protective layer. This example emphasises the point that humans need other species for their survival. The study's findings also show that some participants believed that human beings are not the most important creatures, as all species play a significant role in the ecosystem. Below are some example responses provided by the participants.

> *I don't think they would survive. Because, for example, the trees, we would not be able to breathe. Without animals, we would not be able to have meat to eat. At the end of the day, life is a cycle; each and every part of the cycle plays a role. So, if all the other elements in the cycle are gone, it's almost as if the cycle is broken. And if we were the only ones left, we wouldn't be able to survive (Participant 1).*

> *I don't think that we will be able to survive alone. Again, it goes back to basics. I'll take breathing for example. What we do is that we breathe in oxygen. Where do we get the oxygen from? We get it from plants. We get it from the ozone layer as well which forms part of a protective layer. When we release the carbon dioxide, that also goes into the atmosphere. So really, we would not survive. For example, plants are living organisms and a world without plants means that we won't be able to breathe. We would basically die within an hour or a day. So, we will not be able to survive without other species and organisms (Participant 9).*

Respondents were asked to indicate whether they believe that all forms of life – animals, plants, and humans are equally important. When combining the agree and strongly agree responses, 79.5% of the respondents agreed with the statement, while 14.7% of the respondents disagreed (combined disagree and strongly disagree responses). This finding contrasts with the finding about the importance of humans to other creatures, as discussed earlier, where some of the participants agreed that humans are the most important species of all the creatures on Earth.

The qualitative findings show that the participants emphasised the importance of an ecosystem and the interdependency of species. The participants agreed that humans cannot exist without animals or any other species. They believed that animals, however, could exist without humans as some animals survive on grass that grows naturally. Furthermore, the participants stressed the importance of animals in maintaining the ecosystem and believed in humans' reliance on other species for survival. The common theme that emerged was that humans are dependent on other species. The findings agree with each other, thus indicating data convergence. Below is an excerpt from one of the participants.

> *Not only are humans important, we need to consider other factors such as animals, but personally I disagree with that statement. The ecosystem. I don't know how to describe it, but humans and animals are co-dependent. So, you can't really separate them and say this one is important and that one is not important. They all contribute somehow to our lives. That is my opinion. For example, mushrooms are one of the most important microorganisms in the entire world, without microorganisms in the soil, which is almost no one knows about them. We would not have healthy soil, we would not have trees, we would not have grass, animals pollinated (Participant 4).*

In the literature review, in Chapter 2, the global consensus about the interrelated relationship between the natural environment and the state of the human population was discussed (Pelser, 2012). In other words, the state of the environment and human well-being are interlinked. So, as human surroundings change, so too does the environment (Al-Masri et al., 2023). Social elements have an impact on the natural environment, and human activities continually change the biophysical make-up of the environment. As a result, the relationship between humans and the environment has rapidly changed due to overconsumption. The rapid change in this relationship evidences the fact that this two-way relationship is not straightforward and is rather complex and multifaceted. There have been competing and contradictory views about the relationship between humans and the environment that influence how humans interact with and perceive the environment. For instance, there is the old dominant view of the human-nature

relationship that sees human agents dictating how humans and nature interact. Based on this argument, it is essential to understand humans' attitudes and perceptions towards the environment. The findings of this study are in line with existing literature on the topic in that there are competing and contradictory views on the human-nature relationship.

Evidently, the environment was defined and viewed differently by the participants, which may explain the differences in their perceptions of the environment and their behaviour towards (and within) it. Essentially, there should be a universal definition of what the environment is and what it provides for humans. Broadly, what people need to know is that the environment is a shared living space for all living organisms, which sustains all life.

The impact of environmental issues on humanity is immeasurable; some environmental problems affect a small number of people, while others affect a large number of people. Some environmental issues cause temporary illnesses, and others cause immediate death. And, as research shows, environmental issues are the product of human activities irrespective of their nature and magnitude (Dlamini, 2020). The findings from this research show that human activities have resulted in pathological changes in ecosystems, which is intimately linked to the disparities between the participants' environmental knowledge, attitudes, behaviours, and actions.

Consistently, the participants emphasised the importance of ecosystems and the interdependency of organisms stating also that changes to a single ecosystem affect the entire ecosystem. Participants also indicated that their behaviour towards the environment has changed over the years, as they have learned about endangered species and the scarcity of resources, which has led them to recycle and use resources sparingly. Moreover, they have become more conscious of their environmental behaviour and have made efforts to try and reduce their carbon footprint. In essence, they have become more open to learning about the environment and have made changes to their lifestyles.

Looking at the assumptions of the NEP and the DWW discussed above, the findings suggest that the participants can either be exemptionalist or ecologically-minded. Exemptionalist humans essentially see the environment as infinite and humans as important, while ecologically-minded people see the environment as finite and humans as constrained by its finiteness. Exemptionalist people can also be seen as having an anthropogenic view of the world (a word derived from human activities that cause environmental change).

Based on the findings above, it is clear that the participants perceived the environment differently owing to their unique perspectives. Inherently, all people have unique thoughts, assumptions, and values. Oftentimes, people are not aware of their worldviews and how these influence their behaviours and actions. An individual's environmental worldview is informed and influenced by how they interact with nature, their role in the environment, and how they behave towards the environment. It is evident from the findings that some individuals hold different worldviews. From the findings of this study, the researcher observed that environmental worldviews could be drastically different because some people may be very ecologically-minded, some may not be entirely ecologically-minded, some can hold Western worldviews, and others can have middling or a mixture of worldviews. Essentially, the participants' environmental worldviews fall on a spectrum between anthropogenic on one side and biocentric (or ecologically-minded) on the other side. Where the participants fall on this spectrum depends on the lens through which they see the environment and where value is placed. This study also identified that some of the participants have positive environmental behaviours while others have negative environmental behaviours. The participants' environmental behaviour is an indication of their environmental knowledge.

When linking these findings to the TPB, it has become clear that the gap between people's attitudes and behaviours towards the environment can be attributed to the fact that people gain knowledge in different ways, which is also influenced by cultural norms and customs. Given the findings discussed above, there seems to be a connection between the two attitudinal theories employed in this study concerning environmental attitudes, even though the TPB focuses on external factors that affect individual behaviour, and the NEP focuses on measuring individual environmental attitudes. Indeed, the connection between them has not been found in existing literature. This study has found that the connection between these two theories lies in determining people's environmental attitudes on a cognitive level. Similarly, both theories observe environmental behaviour, concern, knowledge, and attitudes. They both give researchers some perspective on people's level of environmental consciousness.

5.2.2 Planet Earth has limited resources

Respondents were asked to indicate whether they believe there are unlimited natural resources in the world. When combining the disagree options, 57.9% disagreed with the statement, while 24.1% of the respondents agreed with the statement. The qualitative findings also show that participants believed Earth has limited resources, citing water as an example. They indicated

that 65% of the planet is covered by water and that the quality of the water is negatively impacted by pollution. Some of the participants disagreed that Earth has unlimited resources, emphasising the need for sustainability due to increasing concerns, such as water scarcity. They believed that human wastefulness has depleted resources. The participants acknowledged their own personal contributions to environmental degradation but were taking steps to reduce their impact. Moreover, the participants indicated that they personally contribute to environmental degradation through their daily activities, like driving a car and using plastic straws. Considering the constructs of the NEP, the findings show that the respondents believed in an inherent balance in nature. The sentiment the participants held is that nothing is permanent and that it is the responsibility of humans to use resources in a sustainable manner. This sentiment speaks to the NEP, which posits that human factors are not only influenced by social and cultural factors. Instead, there are intricate cause-and-effect linkages in nature that influence human factors, thereby acknowledging that human actions have unintended consequences.

Furthermore, the participants believed that natural resources should not be abused as the environment determines the well-being of humans. However, that well-being is dependent on how much humans can learn from the environment because humans rely on the environment for life. Below are some example responses provided by the participants.

> *Earth does not have an unlimited number of resources. Yes, the whole planet is covered by 65% water, but the quality of that water is determined by the amount of pollution. So, even though you have a set number of resources, if you look at your non-renewable resources. We know that non- renewable resources are dissipating very quickly, for instance, oil and coal. So just by the fact that we know that there are already things like loadshedding, lack of coal, oil prices, petrol prices going up that as a fact shows you that earth does not have an unlimited number of resources (Participant 3).*

> *The way we use the resources, it all comes back to the point that we have limited resources and the challenges that we experience such as loadshedding shows that we do have limited resources (Participant 4).*

The findings provide further insight into the participants' attitudes towards the environment through their behaviour. Some participants reflected on their behaviour, and they indicated that they used cars that burn fossil fuel. Their reflections indicate that humans are responsible for

environmental problems, such as climate change. However, the participants also provided insights into how they try to protect the environment. Below are some example responses provided by the participants.

> *I do contribute to environmental degradation through the use of public transport. So that means pollution, air pollution, noise pollution, being on an aeroplane means air pollution. So, these are all the activities that I do in essence for survival are to the detriment of the earth. It's just important that I be conscious of what I can control. I can't control that. I need to go from point A to B and if point A to B is 10,000 kilometres, I cannot walk. So, I think the back of my head I just have that green thumb. I also try not to litter. Let's reuse those plastic bags, use containers have a vegetable garden at home, have compost. Use some of the overheads for the garden etc., etc. So, as much as I kill the earth, I also try to save it (Participant 2).*

> *Daily I drive my car and that already increases carbon emissions into the atmosphere. I work a lot with hardcopy books, literature, and paper. When you think about it, and all the trees that were cut to get that paper. I still prefer plastic straws so that has also contributed towards environmental degradation. I know that it is such a minute thing because when we think about it, the real perpetrators are the big companies. They still have the audacity to tell the regular individual to use paper cups, paper straws. When we look at the carbon emissions that they emit from their factories, all the waste that get deposited into rivers that is full of life, that water can go into our taps. They still carry much of the responsibility when it comes to the degradation of the environment. We as individuals when you dispose plastic, paper, and waste, it adds up to a certain extent. If you live near a pond or dam, that piece of plastic can be detrimental to the life that is in the water (Participant 9).*

Based on the findings discussed above, the researcher argues that environmental degradation is a serious global problem that occurs when natural resources are used up or destroyed. Indeed, the environment continues to be damaged by human consumption. As explained by the TPB, a rational choice theory employed in many instances to explain intentional behaviours that are motivated by the desire to maximise self-interest (Muposhi, 2012), even though several participants spoke about their pro-environmental behaviours, these behaviours were still

associated with personal benefits, such as not littering or using plastic bottles. Essentially, the participants displayed no pro-environmental behaviours that were not also associated with personal benefits (e.g., not using public transport).

Therefore, drawing on the findings discussed above, it seems that the participants must develop a better understanding of the functions of the environment in sustaining life on Earth, as this may improve the human-nature relationship. The researcher believes that what is needed is an environmental equilibrium, whereby the ecosystem will be in a constant state, and species will be in balance with each other and with the environment. With this in mind, the Population, Environment and Development (PED) nexus is a useful tool that can assist in creating a deeper understanding of the state of the balance between the three components of the nexus. Another important aspect that needs to be communicated to the participants is that natural resources are not abundant but limited. The researcher acknowledges the heterogeneity in people's environmental perceptions due to their social and cultural differences, and other social factors. However, there is great need for a socio-ecological balance between humans, nature, and economies.

A previous study by Klöckner (2013), which focused on people's specific attitudes, showed that the influence of environmental attitude varies based on the nature of the environmental problem and the type of environmental behaviour. In this study, participants' attitudes towards the environment (as a construct of the TPB) were operationalised as how the participants' behaviour towards the environment reflected their level of environmental consciousness. Attitude, in the context of this study, refers to an expression of favourable or non-favourable feelings towards the environment. The findings show that some participants display positive attitudes and behaviours towards the environment, while others display negative attitudes and behaviours towards the environment. The TPB was applied in this study to determine the participants' reasons for exhibiting either pro-environmental or negative attitudes and behaviours towards the environment.

During this research study, the researcher observed that pro-environmental behaviour can be enacted for several reasons based on numerous factors. For instance, some individuals act in a pro-environmental way to save energy, while others do so because of their strong sense of personal responsibility to protect the environment. Such individuals are considered to be ecologically-minded and ecocentric. The findings of this study also speak to how an attitude is enacted through behaviour as posited by the TPB, which assists in determining pro-

environmental behaviour. The findings also revealed the overall concern displayed by participants about environmental problems.

Essentially, the findings of this study are in line with the sentiment of the NEP, which is that humans depend on the biophysical environment, a dependency that poses physical and biological restraints on human affairs. The findings of this study also refute the DWW construct, which posits that the world is vast and provides unlimited opportunities for humans. The findings also show that the participants believed that humans satisfy their needs using limited resources (evident in manufacturing activities) in consideration of the economic system. Some participants acknowledged their personal contribution to environmental degradation through activities like driving a car and using plastic straws. The participants indicated that their means of survival may indeed by detrimental to the environment. Some participants prefer to use their own car instead of using public transport. Therefore, the study's findings reveal that the participants' concerns are either egoistic or biospheric. The findings also provide insight into the value that participants placed on the environment. Environmental value refers to the value attributed to nature and natural resources. Furthermore, it refers to individuals caring for nature and the environment (Kim & Lee, 2023).

One of the constructs of the NEP reflected in the findings was humans' acknowledgement of their role in causing an imbalance in nature and their understanding of the limited nature of natural resources. Previous studies have shown that the NEP was used to explore how environmental concern is a primary cognitive variable stimulating an individual's ecological norms (Kim & Lee, 2023). The findings of this study show that some participants are environmentally oriented, while others are exemptionalist.

5.3 Respondents' perceptions about the relative importance of global and local environmental issues (Research Objective 2)

5.3.1 Serious environmental issues at a national level and ranking the most serious concerns in South Africa

When combining the number of responses to the disagree and strongly disagree options, 96.4% of the respondents disagreed with the statement that South Africa has no environmental problems. Additionally, the qualitative findings show that the participants believed that a developing country like South Africa contributes to pollution from manufacturing. They indicated that South Africa is dependent on primary economic activities such as mining and

agriculture which have an impact on the environment. Below is a response that illustrates this finding.

> *South Africa relies a lot on the primary economic activities. That results in a lot of environmental emissions from mining, agriculture and also the generation of electricity. We mainly rely on coal and that causes a lot of air pollution. The chemicals and the compounds that are released from coal damage the ozone layer. That makes us responsible for the depletion of the ozone layer (Participants 7 and 8).*

In terms of the participants' thoughts about overpopulation as a major contributing factor to all environmental problems, 74.4% of the respondents either agreed or strongly agreed, while 12.8% of the respondents were uncertain about the statement, and 12.8% either disagreed or strongly disagreed with the statement. Question 11 asked the respondents to indicate how serious they think the following environmental issues are: climate change, land degradation, loss of habitats for animals and plants, air pollution, water scarcity, deforestation, and water pollution. The respondents needed to indicate whether they thought the previously mentioned environmental issues were very serious (VS), SS = slightly serious, U= uncertain, LS = less serious, NS = not serious at all, or whether they had never heard of the problem = NH. The proportion of the environmental issues respondents regarded as "very serious" are ranked as follows:

1. Water Scarcity: 88.2
2. Water Pollution: 85.8
3. Air Pollution: 68.2
4. Climate Change: 62.7
5. Land Degradation: 60.4
6. Loss of Habitats for Animals and Plants: 59.8
7. Deforestation: 53.3

As shown above, 88.2% of the respondents indicated that they thought water scarcity was a very serious environmental issue in South Africa, followed by 85.8% of the respondents who deemed water pollution to be a very serious environmental issue. Evidently, water-related problems in South Africa are deemed to be the most pressing environmental issues according to the respondents, especially when considering the often problematic access to water in township households. Literature shows that about 71% of the Earth's surface is covered by

water; water is an in-demand resource humans cannot live without, and it is a habitat for all marine and freshwater organisms (Maurya et al., 2020).

Also evidenced in the findings above is that deforestation was considered the least serious environmental issue in South Africa. This is a noteworthy finding since deforestation is considered a major contributor to the loss of biodiversity (Ali et al., 2021). Biodiversity is the mainstay of agriculture (meaning that it is the foundation of a healthy and productive agricultural system that encompasses a variety of life forms), and its loss has serious implications for future developments. Furthermore, the loss of biodiversity affects humans since our health is greatly dependent on the products provided by plants and animals (Pelser, 2012). Biodiversity is also considered to be the most serious and irreversible environmental issue after climate change. Biodiversity is fundamental for the vitality of ecosystems and supports the life of many ecosystems. Damaging biodiversity endangers the continuity and stability of human prosperity (Block et al., 2024), and the literature shows that those on the African continent are the first to feel the effects of climate change due to deforestation. The effects of climate change are primarily caused by countries with large industries, all of which have a negative effect on the continent's environmental status. The major contributing factors to environmental degradation are human activity from modern industrialisation, deforestation, and overpopulation (Maurya et al., 2020).

When considering the role that humans play in environmental problems such as climate change, 90.8% of the respondents agreed that humans do play a role, while 6.3% felt that humans do not. The qualitative findings show that the participants believed that there are many stakeholders (businesses, people, and government) responsible for environmental problems. They indicated that the biggest manufacturers (in the USA and China) contribute to pollution because of the large scale of industrious processes that take place in those countries. The participants felt that big corporations are mainly responsible for environmental problems since they also contribute to deforestation and pollution. Another point made by the participants was that the government should regulate companies and industries by imposing taxes that may help to address environmental issues. The participants also identified pollution as a significant issue in South Africa and globally and advocated for community involvement, recycling, and government support for sustainability. They stressed, for example, the importance of education in addressing environmental issues and the need to include waste pickers in waste management efforts. In essence, the participants emphasised the role of the government in regulating and having policies that influence people's behaviour towards environmental issues, citing

examples from countries such as Singapore and those in Europe. Below are some example responses provided by the participants.

> *I think pollution in general, focusing on South Africa is very dirty at the moment, even though we have tried to clean it up. There's a lot of funds that are not given to people that clean up our country. So, our country is very dirty and poor but beautiful and it shouldn't be like that. And I think in the world air pollution because we're constantly making something new. I think even with COVID is a lot of new things that were made in bulk (like masks) and the factories used fuel that produced smoke that went out of the factories, So based on this example, I think air pollution is one of the biggest issues we face globally and in South Africa, like littering, land pollution (Participant 1).*

> *I'll touch on the world. Apart from air pollution, I want to focus on deforestation. I read somewhere that in the Amazon, they started to cut down trees to build something, to give that land to a certain company. So, my opinion is, as much as air pollution is an everyday thing. Deforestation is also visible, and it also has an impact on the climate right now (Participant 2).*

> *Regarding South Africa, air and land pollution are a problem. I take it in the South African context regarding land pollution. I don't know if we became so normalised to see filth everywhere that we really don't care if the next person throws a piece of paper. It's seldom that you find an uproar, or you find within a group of friends where one throws out a can on the floor, because what we are often met with is aggressive responses like oh, but I'm creating a job for the next person. So, for the people that pick-up litter in our streets, it has become so normalised that it is worrisome. A second example let's take a strike or protest for example. What normally is our plan of action is to cause disruption. Usually, the first thing that we do is to find all the trash cans we can get hold of. We dispose of that trash right into the streets and in bodies of water. Then it is okay for us. Then when we see that we are not causing much of an uproar for the necessary people, then we burn tyres. What does that do? It contributes to air pollution. Now the biggest culprits with air pollution again are those that own factories. Those chemicals and gasses that are omitted into the atmosphere are alarming. Often, the gasses that are emitted into the atmosphere are not good for humans. This has been*

> *ongoing, there has even been uproars on twitter for example. Some days it smells like a sewerage. That smell is often attributed to gasses like sulphuric acid, which is released into atmosphere. Those things are not good for the human body. Now it makes you wonder if you are inhaling such a huge concentrate, it might not make a difference now. If we continuously inhale such toxic gasses, what happens ultimately, we end up with lung infections, and all other respiratory problems that we probably did not see in the past 50 years. So, my take is that this is not only affecting human beings, but also other life, other species, other organisms. Resulting in animals being born with defects (Participant 9).*

As mentioned in the literature review, Chapter 2, the world has been facing numerous challenges relating to the environment. Development, on the other hand, has been increasing at an alarming rate while the destruction of the natural environment continues. This indicates that development is not sustainable as the demands and needs of growing populations are also increasing. As a result, human society continues to face severe environmental problems such as the energy crisis, the depletion of natural resources, climate change, loss of biodiversity, and pollution, to mention a few. Ever-growing human populations and lifestyle changes increase the severity of environmental problems (Jadhav et al., 2014). The well-being of humans has become a top priority for many nations. However, the depletion of natural resources hurts the well-being of humans. Human activities such as burning biomass and the combustion of fossil fuels generate greenhouse gases that have depleted natural resources due to overconsumption (Pelser, 2012).

Also mentioned in the literature review is that air pollution is considered to be the greatest environmental threat to humans and their health globally. It is caused by the presence of chemicals in the air that are not considered healthy for humans (Tshehla & Wright, 2019). The alarming rate at which the environment is polluted is a result of humans' lack of environmental consciousness (Masekoameng et al., 2021). Previous research has also indicated that countries are experiencing extreme environmental problems that impact the health of both humans and other species (Martín-López et al., 2020). At the same time, environmental problems amplify existing societal problems, such as inequality, social tensions, and poverty. These problems will substantially increase the demand for ecosystem services (more resources). The unfortunate part of this is that human activities will continue to profoundly change ecosystems (Martín-

López et al., 2020). It is clear from the findings above that many stakeholders contribute to environmental damage through human activities.

Overall, the findings show that participants identified land and air pollution as serious environmental problems in South Africa and suggested stricter regulations and monitoring by the government to address these issues. As shown on the verbatim response below:

> *Regarding South Africa, air and land pollution are a problem. I take it in the South African context regarding land pollution. I don't know if we became so normalised to see filth everywhere that we really don't care if the next person throws a piece of paper. It's seldom that you find an uproar, or you find within a group of friends where one throws out a can on the floor, because what we are often met with is aggressive responses like oh, but I'm creating a job for the next person. So, for the people that pick-up litter in our streets, it has become so normalised that it is worrisome. A second example let's take a strike or protest for example. What normally is our plan of action is to cause disruption. Usually, the first thing that we do is to find all the trash cans we can get hold of. We dispose of that trash right into the streets and in bodies of water. Then it is okay for us. Then when we see that we are not causing much of an uproar for the necessary people, then we burn tyres. What does that do? It contributes to air pollution. Now the biggest culprits with air pollution again are those that own factories. Those chemicals and gasses that are omitted into the atmosphere are alarming. Often, the gasses that are emitted into the atmosphere are not good for humans. This has been ongoing, there has even been uproars on twitter for example. Some days it smells like a sewerage. That smell is often attributed to gasses like sulphuric acid, which is released into atmosphere. Those things are not good for the human body. Now it makes you wonder if you are inhaling such a huge concentrate, it might not make a difference now. If we continuously inhale such toxic gasses, what happens ultimately, we end up with lung infections, and all other respiratory problems that we probably did not see in the past 50 years. So, my take is that this is not only affecting human beings, but also other life, other species, other organisms. Resulting in animals being born with defects (Participant 9).*

The participants also highlighted the role of big corporations in contributing to environmental issues but also recognised the role of the individual in contributing to pollution. One can infer

from the findings of this study that some participants are somewhat environmentally conscious, while others are not. Therefore, at some point, all stakeholders need to start taking accountability for their actions; this can only happen once everyone is aware of their level of environmental consciousness.

Question 14 in the online survey asked the respondents to rank the most serious concerns in South Africa that require urgent attention from the government (irrespective of their socio-economic or environmental nature). On the ranking scale, 1 represented the least serious concern and 10 represented extremely serious concerns requiring urgent attention. The question aimed to compare the respondents' perceptions about the various social issues facing the country with their perceptions about the environmental issues which the country faces. The findings below represent the respondents' choice of the top five most serious concerns in South Africa (ranked in order of importance). Interestingly, all top five concerns were socio-economic in nature,

1. Unemployment: 94.66%
2. Crime: 94. 42%
3. Domestic Violence: 93. 45%
4. Poverty: 91.97%
5. Problems with Municipal Service Delivery: 88.56%

The researcher clustered the responses into three categories. Of all the concerns available to respondents to choose from, 78% fell into the most serious category, where a score of 8-10 signified the highest level of concern. A total of 20% of the concerns were categorised as middle-ranking concerns with a score of 4-7, and 2% of the concerns were categorised as not serious with a ranking of 1-3. Based on this categorisation, a surprising observation was that the first environmental concern (water shortages) occupied the sixth position and did not fall within the top five listed concerns. This illustrates that the respondents are less concerned with environmental issues and provides insight into how students rank their concern about environmental issues compared to social issues.

The respondents were asked to indicate what issues they considered were the most serious in South Africa, requiring urgent attention from the government. The findings show that the top five serious concerns were unemployment, crime, domestic violence, poverty, and problems with municipal service delivery. Based on the findings above, it is not surprising that domestic violence occupies the third position. A 2020 Statistics SA report revealed that one in every four

women aged 18-49 years old has experienced domestic violence (Statistics SA, 2020a; Statistics SA, 2020b). Approximately 114 rapes per day are reported in the country, while crime rates are high, with an average of 444 instances of assault per day (Africa Check, 2019). Therefore, it is understandable that respondents ranked domestic violence as a more highly rated issue than, for instance, a social issue such as poverty.

Given the findings above, South Africans (the government, students, and the general population) needs to start prioritising environmental issues and concerns while also tackling other social issues such as unemployment, poverty, and inequality. As mentioned in the discussion earlier, environmental problems amplify existing societal problems such as inequality, social tensions, and poverty. Since environmental issues like climate change continue to worsen, so too do developmental issues. The findings of this study, especially those relating to the ranking of social issues, can be compared and contrasted with other studies. The ranking of the most serious concerns is consistent with findings from other studies indicating that competing social problems in South Africa are regarded as being more important than environmental problems (Meyer 2018; De-Wet Billings, 2022).

A previous study by Meyer (2018) also asked participants to rank environmental problems in comparison to other South African social problems. The findings of that study also indicated that environmental problems are not among the top-ranked social problems in South Africa, but rather ranked as the second least serious category of social problem. The top three most serious problems in Meyer's study (2018) were crime, poverty, and corruption (in that order), and were seen as being severe since they influence individuals directly or indirectly; environmental problems thus took a back seat nationally, as less than half of the population (32.46%) ranked environmental problems as a very serious issue in South Africa. Evidently, the findings illustrated that environmental issues in South Africa are overshadowed by other social issues and concerns.

De Wet-Billings (2022) also found that environmental issues in South Africa are overshadowed by inequality, poverty, access to education, and violence. The study explored the most important challenges in South Africa. Social issues were derived from a cross-sectional study, the South African Social Attitudes Survey (SASAS), conducted in 2017 which was based on the standard core variables that assess sets of behavioural, demographic, and attitudinal variables among South Africans. According to De Wet-Billings (2022), the study identified unemployment as the most important challenge affecting 65,14% of the respondents. Following unemployment were crime and safety at 32.71%, poverty at 28.05%, and HIV/AIDS at 14.78%.

Racism and affordable housing were ranked as the least pressing challenges, with 2.5% and 5.8% of the respondents' votes, respectively.

The results from the De Wet-Billings (2022) study were used as a point of comparison for this study. Important to note is that the findings from both Meyer and De Wet-Billings do not reflect the entire South African population, and the sampling of both studies differed from each other and from this study. The researcher finds it worrisome that the environment and environmental issues are at the bottom of the list, seeing that they occupy the position of least importance. Essentially, environmental issues should deserve the same attention as other social issues. Based on the findings above, the researcher observed that there seems to be a mismatch between the seriousness with which environmental issues and social issues are viewed since some social issues are deemed more important than environmental issues.

Using the theoretical lens of the NEP provides a clear indication of the participants' attitudes towards the environment as well as their perception of environmental issues. Evidently, they are aware of environmental issues, however, they do not consider them to be serious when compared or ranked against social issues. Applying the TPB provides this study with insight into the participants' subjective norms, attitudes, and beliefs that their environmental behaviour makes a positive or negative contribution to their lives. Based on the findings, it can be deduced that participants do not understand the ways in which environmental issues affect them directly. This is a noteworthy finding since, at a national level, this kind of sentiment suggests that there is a need for a major shift in people's attitudes towards the environment. As mentioned in the literature review, the National Environmental Management Act (NEMA) of 1998 shows that the environment is not well-defined in South Africa, therefore suggesting why the country is anthropogenic in nature.

The National Development Plan (NDP) focuses on eradicating poverty and inequality by 2030. Also mentioned in the plan is that South Africa is a contributor to greenhouse gas emissions and is also vulnerable to the effects of climate change on livelihoods, water, food, and health. The NDP states that industries and households, therefore, need to reduce their negative impact on the environment. Missing from the plan, however, is an intentional plan to protect the environment, even though the government has acknowledged its shortcomings in protecting the environment. This lack of government intervention may be the reason why South Africans do not rank environmental concerns highly. The country has yet to redress prevalent environmental issues despite the work that has already been done mostly by non-governmental

environmental organisations (NGOs) such as the Centre for Environmental Rights (CER), GroundWork, etc.

In addition, the environmental performance index report of 2024 indicated that last year, countries globally were off track in terms of becoming sustainable, and the world has entered uncharted climate territory (Block et al., 2024). The ranking of South Africa in the environmental performance index shows that the country still has a long way to go before becoming sustainable. It is also one of the most carbon-intensive economies globally due to the country's heavy reliance on fossil fuels. Also unfortunate is that South Africa is further vulnerable to environmental issues considering the combination of historical, political and social factors it faces, especially because it is regarded as the most unequal country in the world, with an unemployment rate of 34% (Modise et al., 2024).

Considering the discussion above, the researcher observed that there is an intersectionality of injustices happening in South Africa that affect all communities, highlighting the need to focus on intersectional environmentalism, which recognises the existing interdependence of social, economic, and environmental systems. Intersectional environmentalism advocates for both the protection of people and the environment.

5.4 Respondents' environmental attitudes and actions, and their willingness to protect the environment (Research Objective 3)

5.4.1 Participation in public demonstrations

The environmental attitudes and actions of the participants were determined by asking the respondents whether they would take part in public demonstrations to express concern over a specific matter in society or call for action or change. The results of this study indicate that most of the respondents (72.4%) would participate in a human rights demonstration, for instance, to promote the rights of women, children, etc., while 60.5% of the respondents would participate in an environmental demonstration to protest against high levels of air or water pollution, and 52.4% would participate in a political demonstration. Only 14.6% indicated that they actually participated in a demonstration about the environment. It is, therefore, evident that social issues influence South African students from actively taking part in addressing environmental issues, as many of them come from previously disadvantaged backgrounds. Social issues, such as human rights, are deemed to be more important than environmental issues when it comes to taking part in demonstrations. This is interesting since South Africa is known

for its strong protest culture; it has often been referred to as the protest capital of the world or the protest nation because the country has experienced a considerable increase in protest activity (Roberts et al., 2017; Richardson et al., 2022). The findings, therefore, indicate that South African students may be indifferent or ambivalent towards environmental issues (Dlamini et al., 2021b). However, the respondents in some instances express concern and care over the state of the environment. It is interesting to note that their concerns over the environment do not necessarily translate into actions such as protest actions or behavioural changes. As South African students have made their voices heard in Universities, their focus mostly lies on social issues such as unemployment, fees, university dysfunctionalities, and food security. As a result, many South African youth and students have competing priorities, and these could be the reason they are not likely to participate in protest action to address an environmental issue.

The quantitative findings presented above suggest that the perceptions of the student respondents need to change. Furthermore, the findings revealed that students would rather take part in protest action that addresses other social issues, such as gender-based violence or service delivery. What is important, therefore, is that the respondents are educated about the relationship between humans and the environment and that their activities affect the environment. The findings also seem to suggest that the respondents' environmental motivation was low. Environment motivation refers to the personal actions of individuals directly related to environmental improvements. It also refers to the actions taken by individuals to consciously minimise the negative impact of human activities on the environment. Environmental motivation helps determine people’s pro-environmental behaviour, which can be intrinsic or extrinsic (Lee & Kim, 2023).

As mentioned in the literature review, work done to protect the environment can potentially be carried out by young people (Pham & Nguyen, 2022). This is because young people are seen as game-changing actors in environmental consciousness who can address environmental problems (Abarder, 2022). However, South African youth face numerous challenges in their daily lives. In terms of tertiary education, South African youth face issues regarding entry requirements and fees (i.e., they are protesting about bread-and-butter and finance issues) (Mseleku, 2022). However, South African students should start making use of their voices to incite environmental and societal change, as preserving the environment has become a pressing matter for South African youth (Synodinos, 2019). Additionally, universities have a special responsibility for social development and for promoting sustainability awareness. There are,

thus, multiple factors that university students can engage with regarding sustainability. They are psychological (referring to knowledge about the environment), physical (the availability of green facilities), social perception (norms), and political (regulatory and management).

The aim of this study has been to determine why people do what they do and act the way they act (i.e., the TPB). The discussion in this session explained what influences the decisions of the respondents, particularly in terms of protest action. The theoretical implication of the findings in light of the NEP is the rejection of excemptionalism through protest action despite the mixed perceptions of respondents about the environment and their differing environmental motivation.

5.5 Respondents' perceptions of environmental issues and their socio-demographic attributes (Research Objective 4)

5.5.1 Socio-economic attributes

Of the total number of respondents, 70.5% were female and 28.5% were male. Considering the results of the four chi-square tests, females (77.7%) were more inclined than males (63.8%) to disagree with the statement that improving people's quality of life is more important than spending money on the environment. Alternatively, the male respondents (19%) were proportionately more inclined than the female respondents (6.8%) to agree with the statement.

Furthermore, the female respondents (93.8%) were proportionately more inclined than the males (80.2%) to agree that people should be penalised for littering. The female respondents (79.5%) were more inclined than the male respondents (62.9%) to agree that overpopulation is a major contributing factor to all our environmental problems. Lastly, females (77.7%) were proportionately more inclined than males (63.8%) to disagree that there is no problem of overpopulation in South Africa.

A trend observed in these findings is that there are indeed dissenting views among the respondents based on their gender. In the mini groups, the participants suggested that women are more environmentally responsible than men because of how they are socialised. Some participants believed women are more mindful of the environment for the sake of future generations. When looking at the TPB, the construct relevant to this part of the discussion is subjective norms. Focusing on the subjective norms construct, the theory contends that the decision-making of individuals is embedded in a social contextual setting. This refers to the perceived social pressure exerted on individuals to perform certain behaviours. To understand

subjective norms, an individual's social structure, which often consists of family, friends, and opinion leaders, is instrumental in shaping an individual's intention to engage in a behaviour. Subjective norms are usually imparted through socialisation. The findings of this study show the role of family as a socialising agent that influences the knowledge, skills, and attitudes of the participants. This is evident in the qualitative findings, which indicate that the cultural group of the participants affect their environmental attitudes in terms of how their opinions are formed and the opinions they have about the environment and environmental issues. Below are some of the responses provided by the participants.

> *Not to generalise, women are naturally more conscious of what they do. Because let's say for example, in our household, my mom does the groceries, so she knows that when she goes grocery shopping, she needs to take the reusable bags to go shopping. But when my dad does it for example, he will just say, why are we taking this, this is a lot of effort. Let's rather buy more plastics. So, I do think that women are a bit more conscious because at the end of the day, it's creating an environment where your children's children and their children will still be here. So, they don't think of this just the now. They think of the generations to come as well. That's why I think women are just a bit more cautious of what they do. Not that men don't care but they normally want the quick way out (Participant 1).*

> *It goes with the way we were brought up. I'm going to be very controversial. I think that to a certain extent it can be put to gender differences. In a typical home. boys are raised to be very carefree about life. They don't really take much responsibility for themselves and their surroundings. You find that more often than not parents pick up their things after them. Parents cuddle them and they are more protected even in their lack of awareness. When it comes to females, girls are thought from an incredibly early age to take care of themselves and their surroundings, the environment and their family. So, by virtue of that indoctrination, they are more aware to do the things that are more nurturing, more protective. So, a girl will most likely be told to pick up after their brothers. Girls would rather be shouted at for being messy. So, at the back of our minds, whether we are in the house or outside, we are most likely to be more nurturing towards our immediate environment. So that means being cleaner, being aware of the environment. So, I think in that sense, there is a gender difference in how we perceive the environment (Participant 9).*

Literature shows that gender differences influence the human-nature relationship because of socialisation processes and gender roles (Gurieva et al., 2022; Eversberg, 2022). Although there are some researchers who have not found any universal differences in environmental perceptions and attitudes based on gender, the researcher concurs with socialisation theory in that males and females are socialised differently (Fiorilli et al., 2022) and that socialisation affects the environmental perceptions and attitudes of males and females. Beyond the impact of gender on the participants' attitudes toward the environment, the participants also need to know that poverty affects their social consequences, including their cultural lives and families. An economic consequence of poverty is a lack of social mobility and problems with homelessness. Inequality is rife in South Africa and manifests across various dimensions, such as gender, race, and the urban-rural divide (Modise et al., 2024), showing that there are complex power dynamics at play that contribute to the widespread inequalities. It can be acknowledged that competing views are inevitable, owing to people's different socio-economic backgrounds, values, and opinions. Therefore, it is essential to ascertain why the participants have mixed and competing reactions to environmental issues. Understandably, the participants may seek information that agrees with their existing beliefs, thereby discounting contradictory beliefs. However, the differences in participants' views present an opportunity for learning, and that is why environmental consciousness is key.

Regarding socio-economic factors and human consumption, the quantitative findings show that most of the respondents in the study fell into the middle ranking on a scale that indicated socio-economic status using a slider that had 10 positions. This is noteworthy due to the argument that socio-economic conditions affect environmental attitudes (Hunter et al., 2010; Dlamini et al., 2021). For instance, employment status is considered to be an aspect of economic conditions and a significant predictor of environmental perceptions and attitudes. Age is a socio-demographic variable found to be a determinant of environmental behaviour (Dlamini et al., 2020).

The respondents were asked to indicate whether they contribute to any of the environmental problems on Earth. When combining the disagree and strongly disagree responses, 69.6 % of the respondents disagreed, while 16.2% agreed (combined agree and strongly agree responses), and 14.3% were uncertain. The qualitative findings show that the participants engaged in activities that affect the environment. Some participants indicated that they do not recycle and that they drive cars, which increases carbon emissions into the atmosphere. The examples

provided show the participants' negative environmental behaviours which are attributed to their consumption of goods. This is yet another indication of the lack of participants' concern regarding environmental issues. However, they were aware of their environmental behaviour, which they conceded does contribute to environmental problems. These findings reflect the human-focused DWW worldview, as the respondents placed value on how they benefit from the environment to satisfy their human needs. Given the findings, the researcher is mindful of the sensitivities mentioned by the participants such as their contribution to environmental degradation. However, this study also acknowledges the socio-political complexities of the contexts from which the participants come. Important to note, however, is that capitalist-driven societies have a greater force in influencing the environmental behaviours of individuals. This simply means that the decisions made by the participants and their behaviours are also driven by broader societal forces which they have no control over; their choices are thus limited to a certain extent. For instance, South African infrastructure does not enable everyone to drive electric vehicles, which is why some of the participants indicated that by driving cars, they contribute to environmental degradation. So, it is important in such instances to consider the contextualised realities and lived experiences of South Africans.

The participants acquire information about environmental issues from various sources. Some indicated that they acquire their information from academic articles, journal articles, television, and social media platforms such as Instagram (on which they follow environmental advocates and organisations such as the World Health Organisation). Interestingly, they find social media to be an educational platform that provides information about environmental initiatives. Here are two example responses that support this finding.

> *The power of media also plays a role like Twitter, etc. It is everywhere but mostly academic articles and research, social media, television and You Tube. You Tube conveys a lot of videos and adverts on environmental issues (Participant 9).*

> *Social media is important. I subscribe to two types of types of content, one advocates for the environment and the other one is about a young environmental advocate from Germany. I also know that the World Health Organization (WHO) has ads on Instagram stories every 60 minutes (Participant 2).*

Some participants have noticed a shift in society's environmental awareness on platforms like Instagram due to the number of businesses offering eco-friendly products and service options. The participants have become more environmentally conscious due to the impact climate change has had on them (for instance their family's subsistence farming; again, this is a reflection of subjective norms). For example, knowing about subsistence farming is an illustration their environmental knowledge, which encompasses their understanding of environmental issues, causes, consequences, and solutions. Environmental knowledge serves as a framework within which individuals make sense of environmental information, which in turn, informs their perceptions and beliefs (Laheri et al., 2024).

In addition to the participants reflecting on their environmental behaviour, the participants touched on how socio-economic attributes contribute to environmental issues through consumption; they also mentioned some sustainable measures (for human survival) that can be taken to address environmental issues. Therefore, the subsequent two paragraphs present the evidence of these. The sentiments outlined below are an indication of overlapping priorities that shape environmental perceptions.

The participants remain hopeful about human survival, which can be achieved by addressing environmental concerns and reducing pollution. They discussed the potential trade-offs between environmental protection and economic factors, such as job losses. Some participants touched on the impact of fast fashion on pollution in urban areas. Participants also touched on deforestation, climate change, and the importance of education and waste management in addressing environmental issues in South Africa. Environmental attitudes and perceptions are multidimensional and interrelated constructs determined by socio-demographic factors that can be shaped by individual internal or external factors (Kirsten & Biyase, 2023; Kim & Lee, 2024). Previous studies have made efforts to determine people's environmental concerns and attitudes, and measure whether their environmental behaviour was determined by their socio-demographics. However, since then, there has been a prominent need to determine how people, particularly students, perceive the environment. Environmental perceptions and attitudes in South Africa are complex due to the socio-economically diverse nature of the country. In the context of the diverse South African university landscape, students' socio-economic background and involvement in protests do affect their environmental perceptions and attitudes.

The participants also touched on how environmental problems could affect employability, as shifts towards sustainability may result in job losses in polluting industries. The participants

believe that humans will still be around in 300 years because of technological advancements and an increased awareness of environmental issues. Furthermore, they noted that despite the challenges posed by environmental degradation, humans will still be around if behavioural changes happen now to eradicate pollution and help people make sustainable choices. The participants also mentioned the impact of environmental problems on employment, stating that the shift to more sustainable practices, which include the use of robots in factories, may lead to job losses for people working in industries that cause pollution. They also noted that if humans continue to destroy the environment by not being sustainable, the Earth may not exist in 300 years. Therefore, there is a need for balance in protecting people's livelihoods and the environment. Consequently, the unchecked and continuous depletion of resources causes significant challenges to all living things (Ahmad et al., 2023). The above deductions are an indication of the participants' overall environmental knowledge, which can be used to address environmental and social problems. Therefore, it is essential for people to understand the natural state of the ecosystem and its natural processes, as well as the actions of humans that have an impact on the environment.

The findings discussed above emphasise the sentiment of the NEP, which indicates that social and technological progress will continue indefinitely, making all social problems soluble. The findings essentially show that humans produce things to make life easy for them. The researcher agrees with these sentiments as the researcher believes that humans can rectify their mistakes and live in harmony with the environment.

5.6 Limitations

There were several limitations related to the study. These include the fact that some questions in the survey were left unanswered, likely due to respondent burden. This was observed in the data analysis phase of the study. Due to the number of participants acquired for the qualitative phase, the researcher had to amend the methodological process by conducting mini group discussions instead of focus group discussions due to the availability of the participants (the small number of participants was not enough for focus group discussions). The focus of the study was on the participants' environmental behaviours and perceptions and not on other aspects that affect environmental behaviour or inform environmental consciousness. In addition, the results of this study are based on only one institution of higher learning. Despite these limitations, the study uniquely contributes to the body of knowledge in the field of environmental sociology through the mixed methods approach employed. Its contributions also

lie in how the findings of the study have been reported. By acknowledging the limitations of the study, the readers should consider the findings of the study in terms of how they can be translated into actionable outcomes that can be transferred into environmental sociology. A study like this one aims to assist in re-shaping how people think about the environment and how students can become more environmentally conscious.

5.7 Conclusion

The most significant findings that contributed to answering the research objectives were the insights about the importance of all species, the limited resources on planet Earth, the most serious concerns in South Africa, and participation in public demonstrations. Participants shared their beliefs about the importance of humans over other creatures, the value of other species, the likelihood of human survival without other species, unlimited natural resources, personal contributions to environmental degradation, gender differences in environmental perceptions, people's contributions to environmental problems, serious environmental issues on a global and national level, as well as specific environmental concerns within South Africa.

The findings provide some perspective on the different perceptions the participants had concerning the environment. Moreover, the findings show that the participants had mixed reactions to environmental issues. The findings also shed light on why the participants can be considered as being ambivalent and indifferent towards environmental issues. South Africa is bedevilled by many social issues, and the government does not prioritise the protection of the environment. There are also some social issues that are considered to be more important than environmental issues. This is evident from the respondents' ranking of the most serious concerns, the top three being unemployment, crime, and domestic violence, while the first environmental concern (water shortages) occupied the sixth position in the rankings. This ranking illustrates that environmental issues are less of a concern than social concerns. South Africa is a diverse and unique country facing multiple challenges simultaneously. South African youth and students are also challenged simultaneously by issues relating to university access, dysfunctional universities, unemployment, and other societal issues.

Environmental knowledge in the context of this study looked at what students know about the environment and the relationship between people and the environment. The researcher made a key observation that environmental consciousness is an ongoing learning process that informs one's environmental behaviour. The two theoretical frameworks employed in the study shared certain key concepts, which assisted in unpacking the multidimensionality of environmental

consciousness; the theoretical concepts were also reflected in the findings. Essentially, the findings evidence the complexities surrounding people's environmental consciousness. Considering the nature of the study, it is important to consider the contextualised realities and lived experiences of South African students to better understand where their focus lies. The researcher also observed the intersectionality of societal issues and injustices in South Africa (i.e., that all issues do not operate in isolation). South African students need to start recognising the interdependence of social, economic, and environmental systems.

Overall, the findings indicate that the participants are aware of their environmental behaviours as well as environmental problems. Most of the participants reflected on the interconnectedness of the environment and the well-being of all species. They further reflected on the fact that all species need to function in harmony with each other, necessitating the need for balance in protecting people's livelihoods and the environment. All in all, however, there is a great need to alter students' perceptions about the environment, specifically regarding protecting the environment, by taking part in public demonstrations to address environmental issues. There is also a need for individuals to become more aware of their environmental behaviour, which will illustrate their level of environmental consciousness. In terms of guidelines to assist students in becoming more environmentally aware, universities can play a key role in addressing environmental issues and mobilising environmental consciousness. There is also potential for South African students to exercise their environmentalism muscles through mass movements. In the next chapter, the formulation of these guidelines (research objective 5) will be dealt with, and the conclusion of the study will be provided.

Chapter 6: Conclusions and Recommendations

6.1 Introduction

This dissertation was inspired to address the scant research about South African students' perceptions of the environment, environmental issues, their indifference towards environmental issues, and their environmental consciousness. As a result, the study aimed to determine students' levels of environmental consciousness by exploring the extent of their environmental knowledge (a term used interchangeably with environmental concern), as well as their perceptions about the environment and environmental issues. This chapter concludes the study by summarising the key research findings and the value contribution thereof. It also provides guidelines that can be used to increase students' environmental awareness and proposes future research opportunities.

6.2 Summary of key findings

This study aimed to determine the levels of students' environmental consciousness. The study's findings were delineated in Chapter 5 and presented in four sections. In the following sub-sections, the key findings are discussed together to provide a comprehensive summary of the entire study.

6.2.1 A strong presence of anthropogenic worldviews

One of the key findings of the study revealed that 44.1% of the respondents believe that of all the creatures on Earth, humans are the most important. This finding suggests that several respondents hold a DWW view of the world that is human-focused; it sees humans as the dominant species that are different from other creatures since they are the masters of their destinies through their ability to set and achieve their goals. The qualitative findings confirmed the quantitative findings, revealing the participants' belief that humans are the most important species because they can affect change. Again, this finding revealed the dominance of the DWW and anthropogenic views of the world among the participants.

6.2.2 A strong presence of ecologically-minded worldviews

At the same time, however, 46% of the respondents disagreed that humans are the most important creatures on Earth. The qualitative findings revealed that the participants believe that humans depend on nature for survival and need to coexist with animals and plants for survival. Additionally, 29% of the respondents believe all life forms – animals, plants, and humans – are equally important. These findings support the sentiment of the NEP, which posits that all forms of life are equally important. Moreover, 63.4% of the respondents disagreed that humans could survive if all other species on Earth disappeared, while 22.7% were uncertain, and only 14% agreed. The qualitative phase of the study had similar findings revealing the participants' belief in the co-dependency between species.

In terms of planet Earth having unlimited resources, the findings revealed that 57.9% of the respondents disagreed with the statement, while 24.1% agreed, and 18% were uncertain. To evidence this, the participants in the mini groups referenced the fact that 65% of the planet is covered by water, its quality is threatened by pollution. This seems to echo the sentiment of the NEP, which posits the inherent balance present in the environment and the influence of social and cultural factors on human's role in that balance.

The findings highlighted above show that participants expressed competing environmental views, which is to be expected since people inherently have unique thoughts, values and assumptions. Regarding their environmental worldviews, it is clear that the participants are either exemptionalists or ecologically-minded. Exemptionalists see the environment as infinite and humans as important, while ecologically-minded individuals see the environment as finite and humans as being constrained by its finiteness. Therefore, the participants' worldviews fall between anthropogenic and biocentric. The researcher also found that some participants expressed indifference or ambivalent behaviour when asked about their attitudes towards the environment, which may compromise the well-being of all forms of life that are dependent on the environment. Apart from the participants' environmental attitudes, the findings also revealed their general environmental knowledge. The participants know the role the environment plays in people's livelihoods and are aware of environmental issues as well as the role that human activity or behaviour has in causing environmental issues.

6.2.3 Serious environmental issues in South Africa

This section focuses on the findings related to the participants' perceptions of the relative importance of global and local environmental issues. The majority (96.4%) of the respondents disagreed that South Africa has no environmental problems. Similarly, the findings from the qualitative phase of the study revealed the participants' thoughts on the fact that a developing country like South Africa depends on primary activities like mining and agriculture. Furthermore, 40% of the respondents thought that overpopulation significantly contributes to all environmental problems.

The respondents were further asked to rank the seriousness of certain listed environmental issues faced in South Africa (at a national level). The vast majority (88.2%) of the respondents ranked water scarcity as a very serious environmental issue in South Africa, followed by water pollution, which 85.8% of the respondents ranked as a very serious environmental issue in the country. In addition, 90.8% of the respondents disagreed that humans are not responsible for environmental problems like climate change, while 6.3% agreed that humans are responsible. The qualitative findings revealed the participants' belief that many stakeholders, including people, companies, and the government, are responsible for environmental problems.

6.2.4 Socio-economic concerns outrank environmental concerns

The respondents were asked to indicate what they think are the most serious concerns in South Africa needing urgent attention from the government. The top three most serious concerns were unemployment (94.66%), crime (94.42%), and domestic violence (93.45%). The first environmental concern only occupied the sixth position in the ranking. This finding provided some perspective on how important they think environmental issues are when ranked against other social problems in South Africa. Evidently, South Africa needs to start prioritising environmental issues while simultaneously tackling social issues such as unemployment, poverty, and inequality since the country has several social problems that are considered to be more important than environmental problems.

Additionally, the findings revealed the participants' environmental attitudes and actions, as well as their willingness to protect the environment. Such actions include participation in human rights demonstrations (72.4%) to promote the rights of women, children, etc. In comparison, 52.4% of the respondents stated that they would participate in a political demonstration. Comparatively, 60.5% of the respondents indicated that they would participate in an environmental demonstration to protest against high air or water pollution levels. Drawing from

these findings, the researcher observed that a social issue, such as human rights, seems to be more important to the respondents than environmental issues. Therefore, many respondents can be seen as being indifferent or ambivalent towards environmental issues.

Despite making their voices heard in universities, South African students have mostly focused on addressing social issues like unemployment, fees, and certain dysfunctionalities in universities. Consequently, the respondents in this study have competing priorities. Therefore, it is understandable why many of the respondents seem to be disinclined to protect the environment.

6.2.5 Female participants are more pro-environmental than male participants

The findings revealed that there were proportionately more females than males exhibiting pro-environmental behaviour when asked if improving people's quality of life is more important than spending money on the environment. The trend observed in the findings related to gender differences is that there seem to be contrary views among the participants along gender lines. The data suggest that women are more mindful of the environment than men based on how they are socialised. Therefore, the construct of the TPB that is reflected in this finding is that of subjective norms (i.e., the social pressure exerted on individuals by families through socialisation). Based on the findings above, it is evident that environmental consciousness is an ongoing learning process and can be determined by an individual's environmental knowledge, making environmental knowledge an essential aspect of environmental consciousness.

6.5 Recommendations

This section addresses the fifth and final research objective, which was to formulate guidelines to increase the environmental awareness of young people and students. This section reinforces the importance of environmental education for environmental consciousness.

6.5.1 Universities should produce environmentally conscious students through environmental education

Environmentalists in recent times have focused on the environment's response to society's expanding level of education. Increasing people's understanding and knowledge of environmental issues and devastation has become crucial. Education plays a key role in social responsibility and in reducing environmental issues (Bu & Ali, 2022). Education is, therefore,

a key solution to effectively solve societal problems, making it essential in people's lives. Furthermore, education plays a major role in the development of society and is the foundation on which society rests; it enables social prosperity and economic wealth, which is why people enter higher education (Jadhav et al., 2014). Education is also key to encouraging people to live more sustainably and contribute to the green transition (i.e., the shift to an economically sustainable economy, an economy with no overconsumption of natural resources) (Sart, 2022).

Education is a tool that can be used to protect the environment (Maurya et al., 2020). The indispensable role education plays is to enhance people’s ability to receive, decode, and understand information. The processing and interpretation of information can positively impact learning and change behaviour. Indeed, education has recently been regarded as a vehicle that can drive sustainable development. Fundamentally, education is considered to be a permanent learning process that continuously contributes to people's training of acquiring knowledge and soft skills. Maurya et al. (2020) argue that there are three ways in which education can be impactful in combating environmental issues. The first is that educated people are more conscious of environmental problems. This means that, secondly, their behaviours and lifestyles lend themselves towards more sustainable and environmentally friendly lifestyles. Thirdly, people demand environmentally friendly products, and they contribute to the decrease in population growth (Maurya et al., 2020).

Novotný et al. (2021) and Kaur (2019) argue that universities have an important role in building the environmental knowledge, behaviour, and attitudes of their own students and of the broader society and communities that surround them. They should thus produce environmentally conscious students and graduates. Essentially, environmental education can increase people's environmental awareness, enable them to explore environmental issues, and encourage them to participate in actions to restore and protect the environment. Therefore, people need to have a deeper understanding of environmental issues and have the necessary decision-making skills to make informed decisions and take responsibility for their actions. Research on environmental awareness states that universities have become increasingly aware of their role in promoting environmental consciousness among students (Kaur, 2019). All in all, the students of today will become future leaders and their responsibilities will be guided by their educational experiences, enabling them to make informed decisions relating to the environment.

6.5.2 Mobilise environmental activism amongst students

The first Earth Day in 1970 was a student-led mass movement (Jadhav et al., 2014; Dietz, 2020). It was an event that shed light on the world's rife environmental concerns at the time and resulted in concepts, such as ecology and environmentalism, becoming household terms and birthing the modern environmental movement. However, the uptake of individuals participating in Earth Day (as a movement) is limited and is not given the recognition it deserves, and it is not celebrated as it should in South Africa. Even South African students have not leveraged in this movement, which illustrates people's lack of awareness about the Earth or the environment more broadly. Therefore, there is an opportunity to make more of Earth Day in South Africa.

Based on the findings that emerged from this study, the researcher argues that students can mobilise a mass movement that celebrates Earth Day and grows people's awareness of environmental problems. Students seem to have the willingness to advocate for the environment by actively participating in suggesting solutions to environmental problems and speaking up about protecting the environment. There can be university events, such as Earth Day or World Water Day, as part of creating environmental consciousness (to promote and enhance environmental advocacy). Furthermore, there can be practical initiatives and campaigns, such as planting trees or recycling organised material around universities. Such initiatives can be organised as part of teaching and learning for all students, not just those in environmental or ecological disciplines.

Therefore, it is time for the environmental movement to be mobilised, and students should become driving agents supported by universities. The environmental movement should consist of initiatives to clean littered areas, plant trees, use less electricity, limit water usage, etc. South Africa is fertile ground on which to grow environmentally-focused social movements.

6.5.3 Linking social and environmental justice

When thinking about environmentalism, the history of South Africa needs to be taken into consideration. The apartheid regime drove environmentalism as a conservation strategy that neglected social needs. This could be the reason why the participants ranked social issues as more problematic than environmental issues. This underrepresentation of environmental issues in people's minds necessitates the call to link social justice and environmental justice because both affirm the value of all forms of life. Environmental justice is a transformative concept that seeks to respond to the unjust distribution of resources and poor living conditions in South

Africa. The unfortunate reality in South Africa is that many live in appalling and intolerable conditions that are part of the environment and do not have access to the gifts of nature such as water and electricity.

There is a need for sociological engagement to contribute to the struggle for a just transition (a transition from human-focused approaches or from a high-carbon economy to a sustainable and a low-carbon economy without leaving anyone behind), considering the strong protest culture in South Africa. Collective movements can be created to mobilise a just transition. There is also a need to address the interconnectedness and complexities of the relationship between the environment and society. A justly transitioned society will enable sustainability because poverty and unemployment will possibly decline. So, researchers will need to explore what the transition would look like as shifts take place.

6.5.4 Incorporate environmental studies into university curricula across disciplines

Universities can establish sustainable development through teaching and learning programmes, research, and outreach initiatives, including institutional missions and planning (Mutinda & Liu, 2021). All academic programmes and curricula across the different faculties and fields of study should cover essential information about environmental issues. By amending curricula in this way, students will be acquainted with basic skills (such as demonstrating concern and taking environmentally-friendly actions like not littering and being mindful of the usage of resources like water and electricity) and information about the environment (Jadhav et al., 2014). Moreover, curricula should be able to motivate students to participate in solving environmental problems. This is because students have great potential to make other people aware of environmental problems at a grassroots level, outside formal education, through rallies and exhibitions in society and their communities. For example, in 1991, environmental studies became a compulsory subject in all higher education institutions and faculties in India, a directive from the Honourable Supreme (Jadhav et al., 2014). Students who could not attend the classes face-to-face had the option of distance learning. Such a learning programme played a crucial role in educating students about the environment and sharing important information. Regarding formal education, teaching programmes focused on environmental awareness can include lecture series and the celebration of environmental days through exhibitions, conferences, nature visits, and seminars.

Research in higher education about environmental development is also seen as a powerful instrument. Research produced in higher education settings can potentially influence the government and their plans to prepare people for a sustainable future and life. Several institutions focus their research on environmental aspects in the areas of renewable and non-renewable resources to assist in monitoring and controlling pollution and biodiversity conservation (Jadhav et al., 2014; Mutinda & Liu, 2020).

Institutions of higher education have the capacity to address societal problems, especially those that relate to the environment. Similarly, institutions of higher learning can assist with driving sustainable development, which evidences the pivotal role they play in building nations, even though sustainable development remains a challenge for most countries (Jadhav et al., 2014). This presents an opportunity for universities to start reflecting on environmental problems through teaching and learning and by modelling sustainable practices. Such foci may significantly assist in training and expanding students' minds about sustainable development through researched solutions to environmental problems. The researcher thus argues that it would be ideal for ecological concepts and/ or sustainability principles to be included in higher education curricula.

6.5.5 Establish outreach programmes between universities and civil society

Outreach programmes can be created to establish partnerships between universities and civil society (including communities, non-governmental organisations (NGOs) and community-based organisations) for capacity building to solve environmental problems in society. Such capacity creation may, in turn, enhance universities' teaching and research capacity. Outreach programmes play a pivotal role in shaping communities, developing their awareness of environmental problems, and involving them in the production of knowledge to address environmental problems. Capacity building also enables communities to contribute to the knowledge-based economy in academia. Effectively, good management of the environment is essential for development and economic growth.

Such initiatives can draw students nearer to their communities and familiarise them with the needs of these communities regarding sustainable development. This involvement is important since the current generation of students has been regarded as the most environmentally conscious generation (Acharya, 2013; Vilcapoma-Malpartida et al., 2023; Pham Nguyen, 2022). Furthermore, they are the future generation who will make decisions in government, business, and communities.

Institutions of higher education have the potential to help address different environmental problems by using their infrastructure and resources in ways that achieve sustainable development. Essentially, everyone should be familiar with the state of the environment because it constitutes our surroundings and affects our ability to live on Earth (Maurya et al., 2020). The role of higher education in relation to environmental sustainability has thus become prevalent. Therefore, education for sustainable development should start being a basic priority globally. This is because environmental sustainability has increasingly become important in the world (Jadhav et al., 2014). Universities need to start being instrumental in the sustainability movement. Even though every university is unique with its own institutional culture, traditions, and geographical location, the knowledge and expertise of staff can be used to address environmental issues at a local level in relation to the national and global community. Moreover, universities can exchange their respective information and establish strong networks that will promote positive environmental behaviours to lead the way to achieving environmental equilibrium. Based on the discussion above, universities have great potential to assist in addressing environmental issues, and students can voice their environmental concerns through mass movements.

6.5.6 Institutional sustainable development initiatives

The University of the Free State (UFS) should investigate having sustainable development initiatives. For instance, the university could embrace the Sustainable Development Goals (SDGs) by incorporating some of the goals in the mission and strategic intent and academic plans to essentially institutionalise sustainable development more in the institution's organisational culture. The institution needs to investigate the possibility of conducting sustainability research that will essentially facilitate the creation of practical solutions to current and future environmental problems that plague the country, its institutions of higher education, and the world more broadly (Mutinda & Liu, 2020). Furthermore, the institution needs also to evaluate its social and environmental impact status and monitor it consistently. The institution can do so by being involved in the Quacquarelli Symonds (QS) sustainability ranking and being ranked alongside world-class universities. This will enable the UFS to be involved in sustainability work alongside institutions like the North-West University (NWU), the University of Cape Town (UCT) and the University of Johannesburg (UJ). These institutions, for example, reference the United Nations Sustainability Goals in their impact reports, especially the University of Cape Town (UCT) (Mutinda & Liu, 2021). In 2023, the NWU was ranked in the top eight out of 43 institutions in Africa contributing to sustainability

according to the sustainability ranking of the Quacquarelli Symonds (QS). The sustainability ranking looks at how institutions of higher education respond to crucial environmental, governance and social issues (Du Plessis, 2023). Furthermore, the NWU is among the leading educational institutions responding to critical social, environmental, and governance issues.

In the impact reports, the University of the Free State could provide the details about its environmental performance and initiatives and where they are positioned in comparison to other institutions. Furthermore, the researcher is aware that there are discipline specific focus areas within the institution. It would be interesting to get a sense of where the institution is positioned among other institutions in the country. For instance, based on the global sustainability rankings (like the QS World University Rankings for sustainability as included in the discussions), UCT is a top contender because it is consistently ranked highly due to its comprehensive strategy that explicitly includes sustainable goals and having a strong environmental impact (campus sustainability). UJ has also been recognised for its efforts that contribute to the United Nations' Sustainable Development Goals UN SDGs, and it is also included in high impact rankings. Stellenbosch is known for its strong environmental programmes in environmental studies and sustainable development.

Based on the discussion provided, the institution should enhance its commitment and consider making its efforts recognised in sustainability rankings, like the QS Sustainability Rankings and THE Impact Rankings (which is a global ranking system that assessed universities' contributions to the United Nations' Sustainable Development Goals.

The researcher is aware of the existing efforts within in the institution, however, not all of them are accessible to students and well known. Therefore, the institution should be more intentional about the making its sustainable development initiatives more known and far-reaching. This then suggests that the institution should have a centralised platform where environmental initiatives and efforts can be shared, including impact reports.

In addition to the existing initiatives, the institution could have strategic intent to have a sustainable campus by implementing sustainable practices within the campus operations including green building design, and energy efficiency. Furthermore, it can prioritise funding to support sustainability-related student-led initiatives and offer educational programmes about sustainability to the wider community.

With these in place, the institution could become a leader in sustainable development and prepare future generation to know how to address the complex environmental challenges and contribute to a more sustainable future for everyone.

The tenets of sustainability in higher education have emerged from previous oversight, imprecision, and vagueness with regard to creating sustainability plans. This presented an opportunity for world-class universities to promote sustainability (Mutinda & Liu, 2021). Presently, the research of such institutions has focused on integrating sustainable development into core systems through education, research, management, and collaborations, making sustainability a crucial element of institutional frameworks.

Higher education institutions have been identified as stable drivers of sustainability that can help society overcome environmental problems and the challenges associated with achieving sustainable development. They can do so by designing programmes and processes that bring about change for faculties and students. Indeed, higher education institutions have, in fact, been involved in trying to achieve sustainable development since the Stockholm Declaration in 1972 (Mutinda & Liu, 2021). A myriad of other global initiatives has sprouted since then, such as the United Nations Higher Education and Research for Sustainable Development (UN HESD) and the United Nations Higher Education Sustainability Initiative (UN HESI) (Mutinda & Liu, 2021). These sustainability initiatives have called leaders in the international academic community to commit to developing sustainable practices while rethinking teaching and learning, research, and innovation to create and rebuild sustainable higher education institutions and societies.

Universities are, therefore, vital institutions in society acting as sustainability models within their physical spaces to enhance the global agenda of sustainable futures through teaching and research. Research indicates that education, specifically higher education, plays an essential role in promoting environmental awareness and sustainability awareness (Mutinda & Liu, 2021).

6.6 Suggestions for future research

Future studies can look into diversifying the sampling population of this study to eliminate bias and enhance the rigour of such a study. It would be interesting to learn more about students' sentiments across various South African higher education institutions. One way of achieving this is by inviting students from other institutions of higher education to participate in such a study. This will broaden the heterogeneity of sampling and provide a broader representation of

the student population. Another recommendation is to include academics (lecturers) in the study. This will provide additional data that universities can use to start focusing on driving pro-environmental behaviours and creating awareness about environmental issues in South Africa. The research instruments of this study can be used as a standard multi-item scale to measure environmental attitudes and behaviours in longitudinal research to explore how the environmental behaviours of students change over time.

6.7 Conclusions

Environmental consciousness is complex and intersects with societal factors. It does not only entail individuals knowing about the environment and being conscious of their own environmental behaviours. It is also about knowing how the environment and social issues affect their livelihoods since all social issues, whether economic or environmental, are interlinked and do not operate in isolation. The challenge, however, is that social issues are treated as separate from environmental issues, which has implications for the levels of people's environmental consciousness.

The findings of this study have provided insights into the participants' views of the importance of human beings and other creatures. The findings have also provided perspective on the participant's thoughts about whether humans would or would not survive without other species and whether there are unlimited natural resources on Earth. Moreover, perspective was gained on the differences in the participants' environmental perceptions based on gender. The participants also seemed to acknowledge that there are many stakeholders who are responsible for environmental problems. Serious environmental issues in South Africa and worldwide were outlined, as were possible solutions to environmental problems. These solutions included knowing which sources can be used to obtain information about environmental issues, understanding how people can change their environmental behaviours, and understanding that the existence of human beings in the future depends on the quality of the environment and the ability of the environment to execute its functions efficiently. Life expectancy may decrease, but people will likely continue to exist. However, if humans continue to harm the environment, planet Earth, as we have come to know it, may not exist in the years to come. The results of the study do suggest a strong inclination among the participants that all species are equally important and are co-dependent on one another.

The environment has always been something that humans have relied on to meet their physical needs. Environmental consciousness, the phenomenon investigated in this study, seems to have

risen as environmental problems have started to increase rapidly. Environmental consciousness is a determinant of people's knowledge about the environment and the knowledge they have about their impact on the environment. In the context of this study, environmental knowledge was the knowledge students have about the environment and the human-nature relationship.

Additionally, the findings show that the human-nature relationship is complex and multifaceted. This means that the relationship between humans and the environment has ups and downs because the environment has long been considered a source for the material needs of humans. Environmental crises have become prevalent due to people's indifference towards the environment. Therefore, changes need to come into effect, especially in terms of how information about environmental issues is shared, received, and processed. Communication is an especially important factor since the participants' level of environmental consciousness seems to be affected by multiple factors. Therefore, their environmental behaviour varied, and their reactions to environmental problems were mixed owing to competing priorities in society. The study's findings show that the participants had some general knowledge of the environment and environmental issues. However, the findings also show that the participants' views and perceptions were mixed and competing, which possibly evidences the limitations of their environmental knowledge.

From a South African perspective, the findings revealed that environmental issues were ranked low on the participants' personal agendas. Evidently, the country's environmental issues are overshadowed by numerous social and economic issues, illustrating participants' competing priorities even though environmental issues deserve the same attention as other societal issues. The findings thus suggest that there are limitations to the participants' environmental knowledge and an overall lack of awareness about specific environmental issues.

Students can be game-changing environmental actors by increasing their environmental consciousness and assisting in addressing environmental problems. However, the findings of this study showed that the participants face numerous challenges in their daily lives, including issues related to university access, the cost of fees, unemployment, and some dysfunction within universities; students are known for their political activity in expressing their frustrations over such challenges through mass movements.

The findings, however, did show some participants' disinclination to participate in public demonstrations aimed at addressing environmental issues. This indicates that the participants may not be particularly motivated by environmental protest action. However, the findings do

show that there are opportunities for environmental activism and advocacy. This is because South African students have had their voices heard through the #FeesMustFall movement. However, it is important to note that even though students mobilised around fees, it is not necessarily guaranteed that they could mobilise themselves to address environmental issues. In essence, students need to realise the potential of mobilising environmental consciousness through education to protect the environment. As universities have a special responsibility to social development, they must build capacity to promote sustainability awareness and ensure a just transition (a shift from a carbon intensive economy to a low-carbon economy for economies to be environmentally sustainable) for social and environmental justice. Therefore, there is great potential for universities and students to address environmental issues and mobilise environmental consciousness among students and society at large.

Employing a mixed methods approach assisted the researcher in understanding the complex interplay between the environment and social factors. The researcher learned from the findings that the environment and environmental issues are seemingly regarded as separate entities to other social factors. Perhaps this is because more attention is paid to certain social issues than to environmental issues, showing that the human-nature relationship is not well understood or known by the participants of the study.

Overall, the study provided insight into South African students' perceptions of the environment and levels of environmental consciousness through its engagement with students at the UFS. The study's findings can potentially inform universities' evidence-based decision-making and policy development related to the environment. Furthermore, the findings of this study can be taken a step further by focusing on the determinants of South African students' pro-environmental behaviours and how they acquire environmental information. It is essential for people to realise that nature cannot speak for itself. Therefore, humans – and young people in particular – should be the voice of the environment through environmentalism and environmental action.

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Appendices

Appendix A: Research study information leaflet and consent form

RESEARCH STUDY INFORMATION LEAFLET AND CONSENT FORM

DATE

May 2022

TITLE OF THE RESEARCH PROJECT

Environmental consciousness amongst students

PRINCIPLE INVESTIGATOR / RESEARCHER(S) NAME(S) AND CONTACT NUMBER(S):

Bonolo Mahlatsi 2015055521 072 380 5962

FACULTY AND DEPARTMENT:

Faculty of the Humanities

Department of Sociology

STUDY LEADER(S) NAME AND CONTACT NUMBER:

Professor AJ Pelser

Pelseraj@ufs.ac.za

WHAT IS THE AIM / PURPOSE OF THE STUDY?

The aim of this study is to determine the extent to which students at the University of the Free State (UFS) are environmentally conscious.

WHO IS DOING THE RESEARCH?

I, Bonolo Mahlatsi, am a Master of Arts in Sociology student at the University of the Free State, and I am the researcher. Therefore, as part of the Master's programme, I am required to conduct a research study that will contribute to my academic credits.

HAS THE STUDY RECEIVED ETHICAL APPROVAL?

The study has received ethical approval from the General Human Research Ethics Committee (GHREC) at the University of the Free State.

Protocol number: *UFS-HSD2020/2066/21*

WHY ARE YOU INVITED TO TAKE PART IN THIS RESEARCH PROJECT?

Students enrolled at the University of the Free State (UFS) are the target population for this study. Students come from different backgrounds, and they may provide invaluable contributions to the study through their participation in it.

The sample population for this study will include a minimum of 380 randomly selected students from the University of the Free State from all gender types, ages, ethnic groups and all faculties (The Humanities, Natural and Agricultural Sciences, Education, Theology, Economic Management Sciences, Law, Health Sciences). Since you are part of this target population, you have been approached to participate in this study.

WHAT IS THE NATURE OF PARTICIPATION IN THIS STUDY?

The study follows a mixed-methods approach, and it will consist of two phases. The first phase will involve the completion of an online questionnaire. Survey Monkey will be a platform used to complete the questionnaire. You will receive a link to the questionnaire via your ufs4life email. You will be required to read through the information leaflet and sign the informed consent form. When you click on the questionnaire provided by email, it will be equivalent to a signed consent to complete the questionnaire. You will be required to complete a biographical section questionnaire to indicate gender, age, ethnicity, class, faculty, and academic level on the questionnaire. Furthermore, there will be Likert scale questions. The questionnaire will take approximately 30 minutes to complete after academic hours. The second phase will be a follow-up of the first one. Four focus group discussion sessions will be held using Blackboard Collaborate. Participants who have opted to participate in the second phase will be approached and invited to the second phase. You will be required to opt-in for the follow-up focus group discussions.

DATA COLLECTION:

Data gathering will be employing a sequential explanatory approach and will involve two phases. During phase one, survey data will be gathered by means of an online survey questionnaire targeting selected respondents, following a pilot study. The online survey will be

uploaded on Survey Monkey[7]. The researcher will request permission from the research office to send students the questionnaire via their UFS4life email addresses. The second phase will involve collecting qualitative data as a follow-up to the preliminary quantitative results. Online focus group discussions will be held, and they will be recorded. Four discussions will be held consisting of a small group of eight participant held consisting of a small group of eight participants each on Blackboard Collaborate.

CAN THE PARTICIPANT WITHDRAW FROM THE STUDY?

Participation in this study is voluntary. Suppose participants decide to take part in the study. In that case, they will be asked to provide informed consent by clicking on the link provided in the email and continuing with the questionnaire on Survey Monkey. Participants are allowed to withdraw from the study without explaining. However, it will not be possible for participants to withdraw from the study after providing non-identifiable demographic information. Information provided will strictly be kept confidential. Should participants experience any form of emotional distress (physically or psychologically) from participating in the study, they may contact the Director of Student Counselling & Development (SCD), Dr Melissa Barnaschone, for assistance and counselling sessions. Her contact details are as follows:

Email address: BarnaschoneM@ufs.ac.za

Numbers: 051 401 7235

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?

The study will enable participants to become aware of the importance of looking after the environment after determining their level of consciousness towards environmental issues. Furthermore, the information to be obtained in this study will assist the researcher in achieving one of the objectives of the study to formulate guidelines to increase environmental awareness among young people and students in particular. Participants will be informed that their identity will be kept and that their personal information will not be asked.

[7] Before the data collection commenced, there were adjustments done in the methodology. The researcher used *Questback* to distribute the online survey instead of Survey Money (for the quantitative approach), as *Questback* was more user-friendly, cost-effective and convenient. When it was time for the qualitative data collection, the researcher had the opportunity to conduct face-to-face mini group discussions and not use Blackboard Collaborate as previously communicated. It was more convenient to conduct the sessions face-to-face to gain the insights of the participants.

WHAT IS THE ANTICIPATED INCONVENIENCE OF TAKING PART IN THIS STUDY?

Participants may feel psychologically challenged due to connectivity issues or technologically challenged. This might also affect the ways in which they may answer the questionnaires or participate in the online focus group discussions. However, should there be unforeseen circumstances during the research process, students have the right to withdraw from the study without providing an explanation or fearing negative consequences. If participants find themselves distressed (physically, emotionally or physically), they may contact the abovementioned Director of Student Counselling (SCD) for a debriefing session.

WILL WHAT I SAY BE KEPT CONFIDENTIAL?

Confidentiality of the information obtained will be kept and maintained and, participants' names will not be recorded. Verbatim responses provided will be a pseudonym. The supervisor will have access to the data obtained during the collection process and maintain confidentiality. The anonymous data will be used for the purpose of compiling a research report. Participants' personal information will not be identifiable in the research report.

HOW WILL THE INFORMATION BE STORED AND ULTIMATELY DESTROYED?

The information from the electronic questionnaires and the recordings from the Blackboard Collaborate focus group discussions will be saved and be password-protected and encrypted.

WILL I RECEIVE PAYMENT OR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?

There will be no payments or incentives by the researcher to participants so that they can take part in the study since the data will be collected online.

HOW WILL THE PARTICIPANT BE INFORMED OF THE FINDINGS / RESULTS OF THE STUDY?

For informed consent, the research will seek permission from the General Human Research Ethics Committee (GHREC) faculty administration officer - Ms Charné Vercueil VercueilCC@ufs.ac.za 051 401 7083. Participants may contact the researcher via email at

2015066521@ufs4life.ac.za if they would like to have any details and information regarding the study. The findings will be accessible from the day of publication.

Thank you for taking the time to read this information sheet and for participating in this study.

CONSENT TO PARTICIPATE IN THIS STUDY

I, _____ (participant name), confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings.

I agree to the recording of the *online survey*.

I have received a signed copy of the informed consent agreement.

Full Name of Participant: _____

Signature of Participant: _____ Date: _____

Full Name(s) of Researcher(s): _____Bonolo Esther Mahlatsi_____

Signature of Researcher: _____BEM_____ Date: _____

Below you will find the email that will provide the opting in link for informed consent:

I have read and understood the study as described in the information leaflet. I had enough time to ask the researcher questions via the researcher's email address. I am willing and prepared to participate in the study. I understand that my participation in the study is voluntary and that I can freely withdraw at any time. ***By clicking on the questionnaire link provided, I understand that it will be equivalent to informed consent to participate in this study****. I am fully aware that the findings of this study will be processed anonymously into a research report.*

Alternatively, you may indicate whether you agree to participate in the study:

Please tick the appropriate box:	
Yes	
No	

Appendix B: Questionnaire: Environmental consciousness among students

Questionnaire: Environmental consciousness among students

Dear Student

You have been selected to participate in this study undertaken by a Master of Arts Sociology student, Bonolo Mahlatsi. The findings of the study will be used by the student for research purposes (to compile and write a research report from answers obtained from the questionnaire). Please note that even though the questionnaire will be electronic, you will remain anonymous and none of the findings will be traced to you. You may withdraw from participating in the study at any stage should you wish to do so. Your opinion is however very valuable and important to us, and we trust that you will complete the questionnaire. Kindly note that there are no wrong or right answers; your opinion is all that matters.

For any further enquiries, please contact:

Researcher: Bonolo Mahlatsi – 2015066521@ufs4life.ac.za

Researcher's supervisor: Professor AJ Pelser – pelseraj@ufs.ac.za

This section of the questionnaire consists of biographical questions

Please tick the appropriate choices

1. Indicate your gender:

Female	1
Male	2
Non-binary	3

2. Which age category do you fall in?

21 years or younger	1
22 years to 25 years	2
26 years and older	3

3. Of what ethnicity are you?

An Asian person	1
A Black person	2
A Coloured person	3
A White person	4
Other ethnicity	5
Prefer not to say	6

4. How long have you been a registered student at the UFS?

Less than 2 years	1
2-4 years	2
More than 4 years	3

5. Which campus are you studying at?

Bloemfontein campus	1
South campus	2
QwaQwa campus	3

6. Which of the following is your faculty?

The Humanities	1
Education	2
Theology	3
Natural and Agricultural Sciences	4
Economic and Management Sciences	5
Law	6
Health Sciences	7

7. Where did you grow up for most of your life?

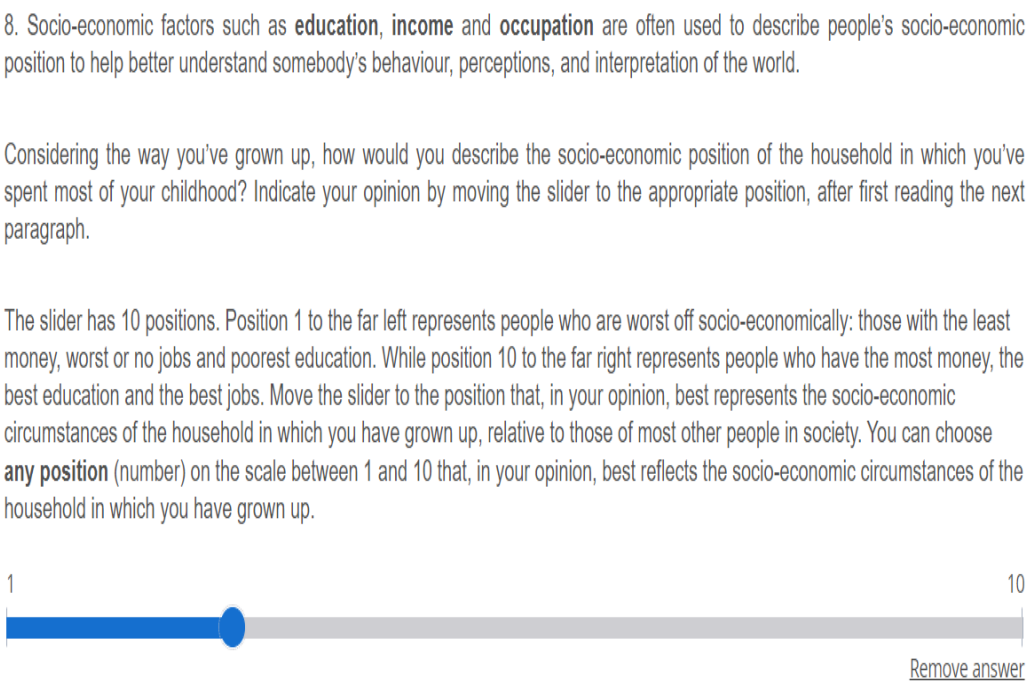
Rural area (on a farm or in a small rural village)	1
Town	2
City	3
Other: Please specify…	

8. Socio-economic factors such as **education**, **income** and **occupation** are often used to describe people's socio-economic position to help better understand somebody's behaviour, perceptions, and interpretation of the world.

Considering the way, you've grown up, how would you describe the socio-economic position of the household in which you've spent most of your childhood? Indicate your opinion by moving the slider to the appropriate position, after first reading the next paragraph.

The slider has 10 positions. Positions 1 to the far left represents people who were worst off socio-economically: those with the least money, worst or no jobs and poorest education. While position 10 to the far right represents people who have the money, the best education, and the best jobs. Move the slider to the position that, in your opinion, best represents the socio-economic circumstances of the household in which you have grown up, relative to those of most of other people in society. You can choose any position (number) on the scale 1 and 10 that, in your opinion, best reflects the socio-economic circumstances of the household in which you have grown up.

Example of Slider from the survey:



In this section, you will be required to read the statements provided and answer accordingly

Indicate your extent of agreement or disagreement with each of the following statements. **SD = strongly disagree; D = disagree; U = uncertain; A = agree; SA = strongly agree**

9. Please select the appropriate choice

Statements	SD	D	U	A	SA
9.1 Of all the creatures on Earth, humans are the most important	1	2	3	4	5
9.2 Even if all other species/creatures on Earth disappear, human beings will still survive	1	2	3	4	5
9.3 I do not contribute to any of the environmental problems on Earth	1	2	3	4	5
9.4 I regularly think about the impact of my actions on the environment	1	2	3	4	5
9.5 All forms of life – animals, plants, humans – are equally important	1	2	3	4	5
9.6 There are solutions for existing environmental problems	1	2	3	4	5
9.7 Humans are NOT responsible for an environmental problem such as climate change	1	2	3	4	5
9.8 I am very concerned about the environmental problems that the planet faces	1	2	3	4	5
9.9 South Africa has no environmental problems	1	2	3	4	5
9.10 There are unlimited natural resources in the world	1	2	3	4	5

9.11 Living a healthy life is more important than worrying about the environment	1	2	3	4	5
9.12 The natural environment will take care of itself	1	2	3	4	5
9.13 I am not concerned about the environment at all	1	2	3	4	5
9.14 Creating jobs is more important than preventing plant and animal species from extinction	1	2	3	4	5
9.15 In South Africa, land should be used for economic activities (such as farming or mining) rather than for conservation (such as nature reserves or national parks)	1	2	3	4	5

Indicate your extent of approval or disapproval with each of the following statements. SA = strongly disapprove; D = disapprove; U = uncertain; A = approve; SA = strongly approve

10. Please select the appropriate choice

Statements	SD	D	U	A	SA
10.1 People should be penalised for littering	1	2	3	4	5
10.2 Improving the quality of life of people is more important than spending money on the environment	1	2	3	4	5
10.3 Overpopulation is a major contributing factor to all our environmental problems	1	2	3	4	5
10.4 There is no problem of overpopulation in South Africa	1	2	3	4	5
10.5 Protecting the natural environment is important to increase the quality of life of people	1	2	3	4	5

11. How serious do you think the following environmental issues are in South Africa? VS = very serious; SS = slightly serious; U = uncertain; LS = less serious; NS = not serious at all; NH = Never heard of problem

Issue	VS	SS	U	LS	NS	*NH*
Climate change	1	2	3	4	5	9
Land degradation	1	2	3	4	5	9
Loss of habitats for animals and plants	1	2	3	4	5	9
Air pollution	1	2	3	4	5	9
Water scarcity	1	2	3	4	5	9
Deforestation	1	2	3	4	5	9
Water pollution	1	2	3	4	5	9

12. Have you ever personally taken part in any protest action with the purpose to have an environmental issue addressed by authorities?

Yes	1
No	2

13. Taking part in public demonstrations is a popular way to express concern over a specific matter in a society towards a call for action or change. Indicate for each of the following statements whether you personally would be prepared to partake in such a demonstration or not:

Would you be prepared to partake in?	Yes	No	Prefer not to say
13.1 A political demonstration? (e.g. to protest against poor service delivery?)	1	2	3
13.2 An economic demonstration? (e.g. protest against unemployment and job losses)	1	2	3
13.3 An environmental demonstration? (e.g. to protest against high levels of air or water pollution)	1	2	3
13.4 A human rights demonstration? (e.g. to promote the rights of women, children etc.)	1	2	3

14. In your opinion, what are the most serious concerns in South Africa that require urgent intervention from government? Allocate a mark out of ten for each of the potential concerns in the list below to indicate its seriousness, where 1= not serious at all (does not require government attention at all) and 10 = extremely serious (requires urgent attention by government).

Concerns	Mark out of 10 for seriousness
14.1 Crime	
14.2 Domestic violence	
14.3 Poverty	

14.4 Unemployment	
14.5 Air pollution	
14.6 Fresh water shortages	
14.7 Problems with Municipal service delivery	
14.8 Climate change	
14.9 Land redistribution	
14.10 Nature conservation	
14.11 Black economic empowerment	
14.12 Housing	
14.13 Undocumented migration	
14.14 Deforestation	
14. 15 Economic growth	
14. 16 Water pollution	

Appendix C: Interview schedule qualitative questions for mini groups discussions

Interview schedule: qualitative questions for mini group discussions:

The above questions will form part of the quantitative aspect of the study – the questionnaire. For the qualitative aspect of the study the following themes will be explored in the online focus group discussions (thematic analysis):

1. In the survey more than one third of the respondents said that they believe human beings are the most important of all the creatures on Earth. Please explain to me why you think so. Do you think other living creatures are of lesser value than humans? Why do you think so?
2. Some respondents said in the survey that humans will still survive even if all other species on earth would disappear. Why do you think humans would be the only specie to survive?
3. Almost one third of the respondents in the survey indicated that planet Earth has unlimited natural resources. Can you explain to me why you think so?
4. Do you think you personally contribute towards the degradation of the environment? How?
5. Do you think there are gender differences in perceptions on environmental issues?
6. In your opinion, who are mostly responsible for environmental problems in a) the world and b) South Africa?
7. What do you regard as the most serious environmental problem in a) South Africa and b) the world? Why? How can we overcome this problem?
8. If you think of humans and all the other living species in the world: which specie, do you think is the most important? Do you think we as humans can survive without any (or all) the other species?
9. Where do you get information about environmental issues? (News, television, social media)
10. Has your behaviour and attitude towards environmental issues changed over the years? How has it changed?
11. Lastly, do you think human beings will still be around in 300 years from now? Why do you think so?

Editing by Michelle Joubert

Annexure D: Letter confirming proof reading

Dear Sir/Madam,

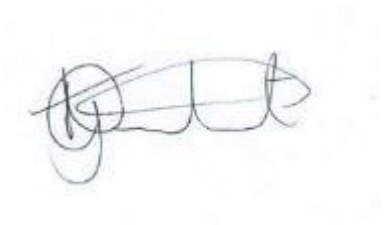
RE: Editing of MA dissertation, Ms Bonolo Mahlatsi

This is a letter to confirm that I, Dr Michelle Joubert, have thoroughly edited and language checked Ms Bonolo Mahlatsi's entire MA dissertation (2024). I am an experienced proofreader with over 12 years of experience editing professional, commercial, and academic documents. Please see my CV below for your perusal.

I trust that you find this letter of confirmation in order.

Please feel free to contact me at michellejoubertediting@gmail.com or on 060 729 6297 should you require any more information from me.

Kind regards,



Dr Michelle Joubert