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Integrating a sustainability curriculum within maritime education: case study of a South African university

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INTEGRATING A SUSTAINABILITY CURRICULUM WITHIN MARITIME EDUCATION: CASE STUDY OF A SOUTH AFRICAN UNIVERSITY

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South Africa

A dissertation submitted to the World Maritime University in partial fulfilment of the requirements for the award of the degree of

MASTER OF SCIENCE
in
MARITIME AFFAIRS
(MARITIME EDUCATION AND TRAINING)

2022

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Declaration

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

(Signature):

(Date): 20/09/2022

Supervised by: Professor Michael Manuel.

Supervisor’s affiliation: World Maritime University
Acknowledgements

“Many plans are in a man’s heart, but the purpose of the LORD will prevail”
Proverbs 19:21 (Berean Standard Bible)

This is the Word that comes to mind upon reflecting on my journey coming to the World Maritime University and during the period of my studies. I equate this experience to the Lords purpose for me because of the exposure I have received and relations that I have been enabled to build during this time and most importantly my development as an individual and a maritime professional. Thank you, heavenly Father, for this opportunity.

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To my family, thank you for being a beacon of hope and showing me continuous support. I cherish you.

To the MET family, I have never felt so belonging. Thank you for the best moments and support. May the Lord order your steps.
Abstract

Title of Dissertation: Integrating a Sustainability Curriculum within Maritime Education: Case Study of a South African University

Degree: Master of Science

Sustainable Development (SD) is increasingly receiving attention in the maritime sector with literature suggesting that sustainability in this sector has moved from being a mere buzzword to a challenge that needs to be tackled with a sense of urgency. It was identified that within the maritime sector the expanding body of literature on sustainable development is centred on maritime decarbonisation which is more focused on international maritime transport and CO₂ emission. Therefore, there is still a gap in the extant literature in relation to sustainable development and maritime education. This indicates that the SD concept and its implications for MET have not been addressed adequately. The aim of this research work was to analyse the relationship between sustainable development curricula and MET in a South African institution. This included developing a model for assessing the integration of SD in Maritime Higher Education (MHEI). The literature used in this research study was used to develop an integration model containing the variables; SD policy and governance, curriculum, research and industry collaboration. The study was qualitative in nature and made use of online-semi structured interviews for all participants and document analyses in a specific case study. The study found that the institution does not follow a structured approach in its integration of SD but has SD projects and industry collaborations with the aim of addressing the challenges of SD. The study further found that both the staff and students regard SD as an important element in maritime education and that it should be prioritised by the institution. According to the findings, the institution still has improvements to be made with regards to SD policy and governance as well as the integration of SD in the curriculum. To assist in addressing the lack of integration of sustainability in curricula the study recommends that South African MHEIs use the proposed model to assess their integration level and further use the variables for sustainability reporting.

KEYWORDS: Sustainable development, maritime education and training, maritime higher education, curriculum
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List of Abbreviations

AU - African Union
CPUT - Cape Peninsula University of Technology
DUT - Durban University of Technology
ESD - Education for Sustainable Development
MESA - Mainstreaming Environment and Sustainability in African Universities
MET - Maritime Education and Training
MHEIS - Maritime Higher Education Institutions
MSC - Maritime Skills Commission
NDP - National Development Plan
POPIA - Protection of Personal Information Act
SADC RISDP - Southern African Development Community’s Regional Indicative Strategic Development Programme
SAMSA - South African Maritime Safety Authority
SAIMI - South African International Maritime Institute
SDGs - Sustainable Development Goals
STCW - International Convention on the Standards of Training, Certification and Watchkeeping for Seafarers
UCT - University of Cape Town
UKZN - University of KwaZulu Natal
UN - United Nations
UNDESD - UN Decade of Education for Sustainable Development
UNESCO - United Nations Educational, Scientific and Cultural Organization
UP - University of Pretoria
VNR - Voluntary National Review
WMU - World Maritime University
Chapter One

Introduction

1.1. Background and problem statement

The concept of Sustainable Development (SD) has gained popularity over the years hence the wide body of literature on sustainability and, likewise, for a long time, the United Nations (UN) has focused its efforts on sustainable development through the UN Sustainable Development Goals (SDGs) (Manuel & Prylipko, 2019). Correspondingly, this study is embedded in Goal 4 of the SDGs, quality education. SD is increasingly receiving attention in the maritime sector with literature suggesting that sustainability in this sector has moved from being a mere buzzword to a challenge that needs to be tackled with a sense of urgency. It is imperative to note that within the maritime sector the expanding body of literature on sustainable development is centred on maritime decarbonisation which is more focused on international maritime transport and CO$_2$ emissions (Koustoumpardis, 2019). The author further argues that there is increasing research on environmental sustainability measures and their evaluation, as well as the impact of mandatory legislative and regulatory measures on operational practices and corporate performance. The focus being mainly on controlling maritime emissions shows that there is still a gap in the literature concerning capacity building and education to ensure that sustainable development is achieved with an adequately trained workforce.

Manuel (2013, p. 475) posits that “the role of appropriate education and training in transferring knowledge, maintaining competence, driving necessary change, addressing emerging challenges, and mitigating the negative consequences of previous actions and decisions are imperative and undisputed.” Žalėnienė and Pereira (2021) share a similar sentiment, arguing that higher education institutions have a special responsibility for training future experts and putting knowledge and ideas into practice. The authors further state that since 1970, universities have taken sustainability into consideration as part of their obligations. Education and training in its nature, is embedded in capacity building and skills development. Consequently, some curricula
will undergo a review or enhancement so that they are continuously relevant to the contemporary needs of society. The extent of integration of the notion of sustainable development in higher education can range from simple policy statements to incorporation into courses, curricula, and other selected activities for a whole educational reform (Sammalisto & Lindhqvist, 2008). Similarly, Maritime Education and Training (MET) was identified as one of the pillars in which the sustainable maritime development goals should be set (Prylipko, 2013; Rowihill & Farag, 2021). As such, Skills Development Scotland (2020, p. 16) reports that,

Universities and colleges, along with skills providers, local authorities, and the third sector play a central role in providing the training, skills and innovation needed by employers across… The magnitude and rate of change now required across all sectors of the economy to achieve net zero demands a significant realignment and ramping up of ‘green’ skills and education provision.

There is still a gap in the extant literature in relation to sustainable development and maritime education. Applicable to the South African context also, World Maritime University (2020) argues that this concept and its implications for MET have not been addressed adequately. Teise and Le Roux (2016, n.p) state that “although South African education policy and practice appear to be oriented towards education for sustainable development, the concept is contested, and ragged (sic) with ambiguity and vagueness”. One of the goals of Vision 2030 of the South African National Development Plan (NDP) is ‘improving education, training and innovation’ and links to SDG 4, quality education, with higher education being listed as the major tool to help achieve these goals. However, even with these measures in place, there still seems to be limited achievement in integrating sustainability in higher education comprehensively, with an even more vague indication when it comes to Maritime Higher Education Institutions (MHEIs).
The imbalance between the skills demanded and the skills supplied is a global challenge and the same will exist if people are trained for the skills demanded for SD without integrating the demands to achieve such within maritime. This is what McGrath and Powel (2016) label as ‘green skills for green economy’. The UK Maritime Skills Commission (MSC) argues the importance of developing ‘green skills’ that will be imperative in driving the transition towards SD. This emphasises that achieving SD depends significantly on adequately skilled people within the maritime industry, inferring the rather important role that is played by MHEIs. Therefore, it is against this backdrop that this research seeks to ascertain the appropriate curricula that will achieve the capacity building and education demands for maritime sustainability and SD within MHEIs in South Africa.

1.2. Aim and objectives
The aim of this research paper is to analyse the relationship between sustainable development curricula and MET in a South African MHEI. Correspondingly, develop a model for assessing the integration of SD in MHEIs. This aim enabled the researcher to also review the extent to which a sustainability curriculum has been introduced or integrated into the current MET courses offered. This aim led to the following objectives:

- To determine how sustainable development is currently integrated into maritime higher education courses in the institution.
- To ascertain the existing challenges for a more comprehensive integration for the sustainable development curriculum in maritime higher education.
- To discuss the change towards improvement that can be adopted by the MHEI in relation to ESD.

1.3. Research questions
- How is sustainable development currently integrated in maritime higher education courses in the institution?
• What are the existing challenges for a more comprehensive integration of sustainable development curriculum in maritime higher education?
• How can change towards improvement be adopted by the MHEI in relation to ESD?

1.4. Methodology, research design and methods
This study makes use of the qualitative approach as the study aims to gain insight on the awareness and integration of SD in South African HEIs. Monsen and Van Horn, (2008) state that the nature of qualitative research enables it to produce data that can be explained in words instead of statistical figures, making it narrative data.

The research methods that were used to obtain data for this research study are the semi-structured interview and document analysis that assisted in achieving the objectives of the study. The data collection methods employed was used to address the three identified research questions. The semi-structured interview was conducted with faculty members and the students of the institution to obtain their perspectives.

By the researcher using multiple methods of data collection and analysis, the confidence in the findings is increased and the validity of the findings is increased. In addition, the researcher is able to capitalise on the strengths of each research method and which helps to mitigate the weakness of the research methods used. The data collected was then analysed accordingly. Once the results were analysed and findings determined, the researcher triangulated and interpreted the obtained data.

1.5. Structure of dissertation
This research study encompasses five chapters based on a specific discussion for each chapter. Below is the outline of the study:

Chapter 1: This chapter introduces the challenge of vagueness around sustainable development and maritime education. The background and problem statement,
research aims and objectives, research questions, methodology research design as well as the research methods are outlined.

**Chapter 2:** This chapter reviews the past and present literature on which this study is based. A brief introduction to sustainable development, education for sustainable development with focus on the South African context and curriculum theory is provided. The chapter concludes by presenting the proposed model for SD for measuring variables towards the integration of SD.

**Chapter 3:** This chapter elaborates on the research design and research methods employed in this study. The research approaches, data collection methods, target population and sampling, data analysis, and development of the research instrument are provided. The chapter concludes by discussing the ethical considerations as well as the limitations of the study.

**Chapter 4:** The findings from the applied research methods are discussed and analysed in this chapter. The chapter begins by discussing the response rate followed by the discussion of findings in relation to themes identified from literature.

**Chapter 5:** This chapter provides the conclusion, the recommendations of this study as well as suggestions for future research. First, the findings are discussed in relation to the research objects, whether they were met or not. The recommendations and future research are then suggested based on the study’s findings.
Chapter Two
Literature Review

2.1 Introduction
Humankind has interacted with the environment throughout history as an intrinsic element of nature. As such, with human beings having constant developments that alter the environment around them and technological advances that have allowed for increased consumption of natural resources, the exploitation of the environment has been unavoidable. As an attempt to mitigate this impact, SD has become a focus of the international community and has been integrated into higher education to disseminate knowledge and prepare students to deal with challenges around this concept.

In the previous chapter, the background and problem statement of this study, the research aim as well as the research objectives and research questions were discussed. In this chapter, the definitions of the key concepts are provided as well as the past and present literature around sustainability curricula and its incorporation into maritime education in general and within the South African context.

2.2. Definition of maritime education and training
To gain a better understanding into the scope of this study, it is important that education and training be distinguished and defined. According to the IMO (2001, p.33),

Education usually means the preparation for careers and for life in general, which involves learning concepts, principles, problem-solving methods etc., whereas training means the preparation for specific jobs or set of tasks. The content of a training course is therefore more specialized than an educational programme.
Training on the other hand according to the MSC (1981, as cited in Masadeh 2012, p. 63) is,

A planned process to modify attitude, knowledge or skill behaviour through a learning experience to achieve effective performance in any activity or range of activities. Its purpose, in the work situation, is to develop the abilities of the individual and to satisfy current and future manpower needs of the organisation.

From these definitions, it can then be deduced that training is more focused on using practical skills, whereas academic education deals more with developing the in-depth analytical and critical thinking skills of students (Manuel, 2017). With this background the author attempts to differentiate between maritime training and maritime higher education, which is the focus of this study. Cunningham (2015, as cited in Ngcobo 2018, p. 09) define MET as “the acquisition of the knowledge and skills related to subjects in the maritime field that enhance competence in the maritime context”. The author further elaborates that the true existence of MET is limited without the mentioning of training. Maritime education contrastingly, is linked to university-style education, more academic rather than vocational in nature.

MHEIs are used as the contextual basis for this research study hence, the relevance of maritime education. Manuel (2017, p.473) argues that in relation to vocational institutions,

there has also been the transformation of national MET systems to include education for and award of academic degrees with the inclusion of more university style education which tends to go beyond the acquisition of specific vocational (task-based skills) to the development of enquiring minds and a more generalist approach.
Emphasising the difference between vocational and academic institutions, the latter part of the statement then depicts the nature of MHEIs.

2.3 Background of sustainable development

It is worth mentioning that although this study does not aim to provide a detailed discussion regarding the evolution of sustainable development, for the purposes of understanding the foundation of this research study and its relation to maritime education, a brief overview is provided. Currently, the understanding of sustainable development is centred on the 1987 publication by the World Commission on Environment and Development (WCED) report titled ‘Our Common Future’ which was sponsored by the UN. “Despite acclaimed vagueness and ambiguity, the WCED definition of sustainable development has been highly instrumental in developing a ‘global view’ with respect to our planet’s future” (Mebratu, 1998, p. 494). As a result, multiple initiatives have been taken at the local, national and international level in an attempt to address sustainable development. As a consequence, a great number of instruments and standards have been established and expanded in the years past in order to bring together economic and technological development whilst protecting the environment and social wellbeing, this has now been incorporated into the broad-encompassing concept of sustainable development.

Inarguably, the UN has played quite an imperative role in driving and governing sustainable development. According to Kunugi (1992, p.112), the UN, as an international institution, has been instrumental in contributing to the process by “setting standards and providing framework for collaborative endeavours” The author goes on to argue that to achieve a broad participatory process all levels of society must be involved including the private and public sectors. Similarly, Moallemi et al. (2020) are of the belief that to achieve inclusive SD, collective participation and action by
different stakeholders – individuals, NGOs, private sector, and the public sector is required. The authors further postulate the need to increase the establishment of bottom-up initiatives in order to meet the ambitions of sustainable development. This draws from the statement by the UN that the implementation plan for sustainable development can be achieved through collaborative partnership by all Member States and stakeholders.

Over the years the UN has employed different international strategies for tackling sustainability, including the current 2030 Agenda for Sustainable Development adopted in 2015, spanning a period of 15 years to achieve the intended goal targets. According to UNESCO (n.d), this Agenda is a “plan of action for people, planet and prosperity”. The plan is made up of 17 intertwined Sustainable Development Goals (SDGs), which include social, economic, and environmental aspects. With just eight years to go, a quite ambitious global effort is on-going to deliver the sustainable development agenda and mobilising stakeholders to achieve these goals as their own. The UN (2020) states that although there is progress being made towards the targets of these goals, the progress is not advancing at the level required.

However, the SDGs have not been without criticism. The SDGs as the successor of the Millennial Development Goals (MDGs) have, according to Vandemoortele (2018), have failed to address sustainability intently. The author argues that by making Climate Action goal 13 does less for the agenda’s objective towards the planet and this is indicative of the goals’ relative importance. Current literature indicates that the targets of the SDGs are formulated in a manner that is vague and lacks of comprehensive detail (Spangenberg, 2017; Vandemoortele, 2018; Aerni, 2021). Another criticism of the SDGs in the literature is that they are not binding, although countries are expected to take ownership of SDGs. As a result, signatory countries are not penalised if lacking in implementation and the ripple effect is not meeting the Agenda 2030 targets.
2.4 Education for sustainable development

The literature indicates that Education for Sustainable Development (ESD) was launched as a response to coping with sustainability and sustainable development (Prylipko, 2013; Pauw et al., 2015; Tiese & Le Roux, 2016). This signifies the role of education and training as a foundation for successfully implementing SD. Tiese and Le Roux (2016) define ESD as an educational method that promotes sustainability by acting as a catalyst for social change. The aim of ESD is to provide every human being with the chance to gain the attitudes, skills, knowledge and values required to construct a sustainable future. Climate change, disaster risk reduction, biodiversity, poverty reduction, and sustainable consumerism are examples of significant sustainable development concerns that should be included in teaching and learning (Sikdar, n.d).

The author highlights that ESD requires teaching and learning methods that encourage participation from students so that they are motivated and empowered for behaviour change and action towards sustainable development. As a result, the students’ critical thinking around sustainable development is encouraged. They can also make decisions in a collaborative manner.

Since the UN Decade of Education for Sustainable Development (DESD), UNESCO has been the primary UN agency to responsible for driving ESD, covering the period 2005-2014. Currently, the agency is tasked with coordinating the ESD for the 2030 Framework, covering the period from 2020 – 2030. According to UNESCO (2019), the ESD for 2030 Framework, as the global framework, offers to strengthen the contribution of ESD to all SDGs, with particular focus on SDG 4 – quality education. Whilst the DESD aimed to integrate the principles as well as the practices of sustainable development into education and learning, the ESD for 2030 Framework builds on this foundation and aims to achieve the sustainable development objectives by placing a larger emphasis on the learning content’s contribution to humanity’s survival and prosperity.
UNESCO (2021) states that “ESD is recognized as a key enabler of all SDGs and achieves its purpose by transforming society. ESD empowers people of all genders, ages, present and future generations, while respecting cultural diversity.” This definition by UNESCO shows that ESD has its basis on the values and principles of sustainable development. The organisation further elaborates that ESD forms an essential part of quality education and is a lifelong process of learning. This definition encompasses the all-inclusive and transformational objective of ESD. As depicted in Figure 1, like any formal education, ESD includes content used for learning, learning outcomes, pedagogy and the environment for learning.

**Figure 1: ESD Cycle**

Moreover, UNESCO (2021) highlights that ESD is accepted as an integral part of SDG 4, Quality Education and recognised as a key driver for all SDGs. The aim of SDG 4
is to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” (UN, n.d). As such, SDG4 consists of seven targets towards the 2030 Agenda for Sustainable Development, focusing on the different stages of education. This research paper focuses on target 4.7 which has ambitions that speak to SD. This is the only target that focuses on the educational content aimed at the development of knowledge as well as skills for SD. Target 4.7 by 2030 aims to;

ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development (UNStats, 2022).

This target then raises questions that include determining the kind of skills and knowledge that will be needed to achieve sustainable living and the kind of educational programs that are required to develop the knowledge and abilities required for living sustainably and global citizenship. Most importantly, determining how these educational programmes are useable and working towards achieving this target’s objective. Accordingly, target 4.7 is also made up of five indicators including 4.7.1 as the global indicator. Currently, the global indicator for this target is “4.7.1 Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment” (UNESCO, 2017, p.02). Similarly, to all SDGs, the indicators for this target are the outcome of a lengthy political process.
The literature indicates that target 4.7, in comparison to the other targets, focuses more on different aspects such as humanistic, social and educational moral goals. The Global Education Monitoring (GEM) report (2016), ‘Education for people and planet’ states that target 4.7 explicitly connects education with the other SDGs and encapsulates the transformative goals of the 2030 sustainable development agenda. This report focused on this global indicator and examined how sustainable development has been incorporated in interventions that are system-wide including curricular resources such as nationally adopted curriculum frame works, education programmes for teachers as well as textbooks. Moreover, the report emphasises that it is difficult to come up with indicators to track the knowledge, skills, and attitudes required to achieve sustainable development.

With the above discussion indicating that the SDGs and, in particular, SDG 4 is focus on the lower levels of education and make no mention of HEIs, it is imperative to highlight the role played by HEIs towards the successful implementation of the goals. HEIs are not under any obligation to adopt the SDGs, however, their contribution to society’s needs and their critical roles in generating and transmitting knowledge that will help transform society, make them eligible participants in the realisation of the SDGs. Nhamo (2020), in arguing the role of HEIs in the delivery of SDGs, is of the view that the objectives of all 17 SDGs will not be attained without the active involvement and engagement of universities. Bhowmik et al. (2017 as cited in Nhamo, 2020) posit that HEIs (mostly universities) are expected to offer evidence-based solutions to speed up the implementation of SDGs around the world through leveraging their established research and innovation capacities as well as their connections to industries with financial resources. Similarly, Nhamo and Mjimba (2020, p. 32) argue that “to this end, HEIs are expected to assist in raising awareness and educating the public on the SDGs and other sustainable development related agendas, including where we are coming from regarding the unfinished business of the MDGs”.

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2.5 National frameworks for sustainable development

A national framework is crucial for offering guidance and influencing the making of decisions that are important in society. To realise any policy goals set by the government to generally improve the welfare of people, it is important that coordination exist between government policies (UNCTAD, 2011). This is largely because if these government policies are not in harmony, especially concerning implementation, the chances of achieving the desired goals are hampered and the policies become ineffective. Likewise, Fourie (2018) states that coherence between the development policies of recipients and the development aid providers is essential for long-term development. This is true also regarding the localisation of the SDGs.

As of 2012, the National Development Plan (NDP) and the Vision 2030 in South Africa have been introduced with aims to address the country’s primary challenges of unemployment, poverty and inequality. Chapter nine of the NDP is dedicated to ‘improving education, innovation and training’ with targets for 2030. According to the National Planning Commission (2011, p. 261), “education, training and innovation are central to South Africa’s long-term development”. Although the NDP Vision 2030 was adopted in 2012, four years earlier than the SDGs, both agendas share similar notions. For instance, like SDG 4, the NDP advocates for education and training opportunities that are embedded in lifelong learning and envisions that “all children can access and benefit from a high quality education” (p. 264). The NDP contains other targets that align with the targets of the SDGs such as Chapter 5 which states that “by, 2030, South Africa’s transition to an environmentally sustainable, climate change resilient, low carbon economy...” (p. 32). However, for the sake of this study, the discussion focuses on the aspect of education.

The Voluntary National Review (VNR) (2019) report reveals that the NDP goals are closely linked to the SDGs as well as the African Union (AU) Agenda 2063, and are amalgamated into the government’s planning processes and systems at national, provincial and local level. This indicates the country’s commitment towards the
effective implementation of Agenda 2030 as a Member State of the UN. The report elaborately indicates that with regards to policy and creating an enabling environment with the localization of the 2030 agenda, “South Africa is deeply committed to the goals set out in the SDGs, the African Union’s Agenda 2063 – the Africa We Want – to achieve a prosperous Africa based on inclusive growth and sustainable development, and the Southern African Development Community’s Regional Indicative Strategic Development Programme (SADC RISDP)”. The role played by South Africa with these global SDG goals, continental as well as the regional agenda has proved a critical one. For instance, South Africa, as the alternating Chair of the G77+China, headed the group during the SDG negotiations (Sidiropoulos, 2019). Similarly, the adoption of the AU Agenda 2063 took place in 2013 under chairpersonship from South Africa. Through the national statistical service, Statistics SA, the country has been able to play a major role concerning the development of the SDG indicators and AUs Agenda 2063 and these agendas prove to be reinforcing one another along with the NDP. Hence, government policies and the legal framework reflect connection to the SGDs.

2.5.1 Institutional mechanisms
According to the VNR (2019), the South African government, to ensure active stakeholder engagement - including the Department of Higher Education and Training (DHET), on the implementation, monitoring of SDGs as well as reviewing relevant policies, has created new institutional requirements for internal coordination so that there can be improved coherence on development plans at global, regional and national level. The Department of Planning, Monitoring and Evaluation was tasked with the responsibility of overseeing the “strategic planning, coordination of policy design and implementation, performance monitoring and accountability monitors the implementation of the NDP at the national level and leads the quarterly reporting to Cabinet on the implementation of the outcomes of the MTSF, an important implementation vehicle for the NDP” (VNR, 2019, p. 22).
The National Steering Committee for this coordination is made up of different director generals, including the Environmental Affairs, DHET as well as Basic Education. This structure was established to enhance the implementation of developing the adequate policies and reviewing the progress of the SDGs as well as the other agendas that the country is signatory to. These are the same policies that inform the decisions taken by higher education. For instance, Nhama (2020), states that the University of South Africa (Unisa) has policies underpinned by the NDP Vision 2030 and Agenda 2030 towards sustainable development.

### 2.6. Curriculum theory

Before delving into the concept of curriculum theory, it is important to first define the terms curriculum theory. Yaşar and Aslan (2021, p. 237) define curriculum as “the constitution of education that directs an education system and defines the individuals to be raised in society”. The authors emphasise that curricular related decisions provide vital hints that influence the entire process of teaching and learning. The curriculum development process is one that entails answering a lot of questions and this includes questions such as what knowledge is most valuable to disseminate, what should be taught, to whom, how the different parts of the curriculum should be connected (Null, 2016 cited in Yaşar & Aslan, 2021). From this statement, it can be inferred that curriculum questions are crucial, pose the need for in-depth investigations and are inextricably linked to decision-making.

With respect to theory, Beauchamp (1982) posits that it is necessary to define what the term "theory" means and how it was employed in the notion of curriculum theory. The Oxford dictionary (n.d) defines theory as “a formal set of ideas that is intended to explain why something happens or exists and the principles on which a particular subject is based.” Kerlinger (197, as cited in Beauchamp, 1982) on the other hand defined theory as “a set of interrelated constructs (concepts), definitions, and propositions that present a systematic view of phenomena by specifying relations
among variables with the purpose of explaining and predicting the phenomena.” The literature indicates broad definitions of the concept of theory, which take on connotations unique to the field in which the theory applied (Yaşar & Aslan, 2021). Yaşar and Aslan (2021), further argue that it is with similar reasoning that the word ‘theory’ in curriculum theory derives its meaning specifically to each curriculum field.

Curriculum theory is “a set of related statements that give meaning to a school’s curriculum by pointing out the relationships among its elements and directing its development, its use and its evaluation” (Beauchamp, 1975, p.58). The four elements of curriculum theory, according to Scott (2001, n.p) are “aims or objectives, content or subject matter, methods or procedures, and evaluation or assessment”. As such, the notion of curriculum theory is an attempt to focus the attention on all the different aspects of education within institutions from the development of curriculum and to its enactment. Mbwambo (n.d) also argues that curriculum theory encompasses formal curriculum – categorising knowledge into concepts, subjects, disciplines etc. the curriculums objectives, the appropriate methods for achieving the curricula goals and the instruction. This proves the necessity of curriculum theory in the process of curriculum planning and, eventually, curriculum development as it serves as a guiding principle. Thus, it would provide curriculum designers with a critical perspective on how to explain and predict the possible and adequate methods for integrating ESD in maritime education.

2.7 Education for sustainable development within the South African context

As highlighted in the previous discussion of national frameworks for sustainable development, South Africa has played an instrumental role in the development of the Agenda 2030 of the UN as a result of the NDPs Vision 2030 which is closely aligned to the UNs Agenda 2030 along the SDG as well as the AU's Agenda 2063. As such, the country’s HEIs adopt policies that are aligned to these goals. However, Tiese and
le Roux (2016) make the argument that, although South Africa has an education policy as well as practice that appears to be focused on ESD, the concept is still contested and characterised with vagueness. The authors further emphasise that South Africa’s education transformation is primarily focused on social change and the vagueness towards ESD can hinder achieving an education system that contributes to social change as well as sustainable development. Similarly, Mjimba and Nhamo (2020), posit that although the country is signatory to different agendas consistent with the objectives of the SDGs, there are still some implementation gaps regarding the ESD.

The 2013 edition of the National Journeys towards Education for Sustainable Development reviewed the experiences of six countries on ESD including South Africa (Clayson, 2013). The report states that to achieve the government’s strategy for SDGs will only be meaningful if there is an integration of quality education and sustainable development related occupational skills into the entire national learning system. As a result, the country will be propelled to deliver on its international agreements and ensure that the citizens have the necessary skills for leadership and policy for service delivery that will be effective towards ESD, hence, the skills gap is also a factor in the environmental sector.

The literature indicates that there has been a growing interest in how HEIs are responding to the issues of sustainable development and further indicates that ESD in higher education is incorporated into the academic and research programmes as well as partnerships for ESD. For instance, on research programmes, the Rhodes university has the Environmental Education and Sustainability Unit that focuses on postgraduate and graduate scholarly functions in the Faculty of Education. The programme also offers a level 5/6 open-access course to satisfy the demand for staff at entry-level in environmental education across sectoral organizations (Clayson, 2013). The University of Cape Town (UCT) has the Green Campus Initiative, a programme aimed at making the institution sustainable and environmentally friendly.
Concerning sustainability courses, Study Portals (2022) shows that south African HEIs offer different courses at bachelor level. For instance, a BA in Development and Environment is offered by the Stellenbosch University, in Community and Development Studies by the University of KwaZulu Natal (UKZN), and in Rural Development by the University of Pretoria (UP) to mention a few. The report on National Journeys Towards Education for Sustainable Development reveals that a review conducted by the Department of Science and Technology indicates that 50% of South Africa’s HEIs offer Masters programmes in sustainability and environment sciences. Although the postgraduate programmes lean more to science and these Masters degrees’ pale in comparison to similar international ones concerning orientation on work-integrated learning, the review shows that there is emphasis on “inter-disciplinary programmes that have a good mix of socio-economic and natural sciences, and address various dimensions of the environment (ecological, social, economic and even cultural issues)” (Clayson, 2013, p. 71). This reflects the socio-ecological and multidimensional character of environmental concerns and threats.

Regarding partnerships for ESD, the Mainstreaming Environment and Sustainability in African Universities (MESA) programme for partnership by the UN Environment’s was founded with the aim of universities supporting the UN Decade of Education for Sustainable Development (UNDESD) and currently has membership of over 85 African universities of which five are South African. MESA supports African universities to include environmental and sustainability considerations into their teaching, research, community participation, and management.

The discussions in this research indicate that ESD is explicitly stated in South Africa’s policy on national curriculum. The connection between environmental justice, inclusion and ESD is clearly defined. However, coordination at national and community levels has been hampered by the lack of ESD strategy and a coordinating authority at national level (Clayson, 2013). As a result, a lot of work may be taking place on the ground but can be disconnected from the national systems. Also, the
absence of national strategy creates monitoring and evaluation challenges. It is important to note that the examples of courses that are ESD influenced presented in this literature, in the context of South Africa, are not based on maritime education. However, the next section of this literature review looks at how ESD has been integrated, and in the absence, how it can be integrated into maritime education.

2.8 Integrating ESD into maritime education
After the discussion indicating the alignment of South Africa’s national framework with sustainable development, one may ask about the positioning of MHEIs concerning the content for learning, materials used and the methods to influence the students in alignment with sustainable development. However, before discussing the integration of ESD in maritime education, a brief overview on the state of South African maritime education is necessary for this research. Unlike its African counterparts – Ghana, Egypt and Nigeria among others, the country does not have an independent maritime university. Instead the South African International Maritime Institute (SAIMI) is hosted by the Nelson Mandela University (NMU) and the other HEIs offer Maritime-related courses.

According to Kuhlase (2020), MET for seafarer training specifically is regulated by the International Convention on the Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978 as amended - an instrument of the IMO. The South African Maritime Safety Authority (SAMSA) is recognised as the maritime administration and as such, the training of seafarers is certified by this body. However, maritime education is not limited to that of seafarer vocational training but different MHEIs offer maritime related courses which are more based on the academic system. Similarly, Rahman et al. (2022), state that maritime education as a topic has shifted from focusing on transportation, logistics and management to incorporating maritime brokerage, maritime economics, salvage, insurance, and policy among others.

For instance, the Durban University of Technology (DUT) and the Cape Peninsula University of Technology (CPUT) offer a National Diploma in Maritime studies where
theoretical study is 2 years and 1 year is experiential learning. UKZN under the Unit of Maritime Law and Maritime Studies offers a postgraduate diploma in maritime studies which focuses on maritime economics, shipping law as well as customs and excise (UKZN, 2021). The maritime courses in the different MHEIs vary from undergraduate to postgraduate qualifications which target different occupational levels in the maritime industry but the majority of the universities offer postgraduate courses. As such, Prylipko (2013, p.51) postulates that the integration of sustainable maritime development in MET programmes will vary dependent on these factors:

i. the level of educational programme (undergraduate or postgraduate);

ii. character of responsibilities for future profession (managerial or operational);

iii. relevance of the profession to sustainable maritime development;

iv. particularities of the national, regional and international maritime policy and practices of the industry.

Therefore, the author further argues that maritime policy and shipping practices are vital for curriculum development since they basically identify the industry’s current stage and aims for its future development. The function then that is played by MET in this process is to produce maritime professionals that will be competent in order to complete and complement the industry’s transformation. The marrying of the maritime policy and industry’s objectives with the curriculum to produce a competent maritime professional proves imperative to avoid misalignment between the three aspects and the graduates produced by MHEIs. The same is applicable in the curriculum development process where situational analysis, and training needs assessment help the developers identify the need for a course and the methods of delivery and assessment that will achieve the desired competences and help achieve transformation.

The literature indicates that all countries face the essential decision of addressing and adopting the adequate ESD strategy. McKeown et al. (2002) argued that a country has to decide on the method that will be used to implement ESD, for instance, whether
the ESD curriculum will be dovetailed into an existing program as a subject or
introduce a completely new program to address sustainable development. The authors
further stress that in making this decision the relevance and appropriateness of ESD
integration must be consideration so as to avoid quantifying ESD. Björneloo et al
(2008, p37) on the other hand posit that “ESD should not be treated as a separate
subject but rather a way of dealing with all the curriculum subjects”. However, these
approaches lack the specificity and depth that concerns curriculum development for
MET. It is important to take into consideration the criteria listed by Prylipko (2013) in
the previous discussion as well as the kind of MET institution. In doing so, ESD does
not become limited to just updating the curriculum to include sustainability concepts
but becomes inherently embedded in the MET system.

The University of Gothenburg (2008) in the Gothenburg Recommendations on
Education for Sustainable Development report states that ESD should be entrenched
in steering documents, curricula and learning materials. As a result, reviewing the
current curricula and developing new curricula becomes a factor in the integration of
ESD in maritime education. MHEIs have different methods of introducing knowledge
concerning sustainable maritime development such as making it an individual
discipline. For instance, The University of Plymouth in the UK offers a BSc, BSc
(Hons) and MSc in Sustainable Maritime Operations. So far in South Africa,
sustainable maritime development has not been introduced either as subject nor a
discipline. In this instance then a reorientation of maritime education is needed and
will require an extension beyond the disciplinary approaches currently applied to
developing curriculum approaches that are multidisciplinary, interdisciplinary and
even transdisciplinary (University of Gothenburg, 2008).

However, a successful integration of sustainable maritime development in maritime
education goes beyond the curriculum and pedagogical approaches to include ‘training
the trainers’ in sustainable development and the implementation of practices that
correspond with sustainable development in the management of MHEIs. This is
because the core principles of ESD are embedded in aligning all the aspects of education from the policy documents, research, the instructors, to the content delivered. Bataineh and Aga (2022), share a similar argument that instructors should learn the skills that will help in the implementation of an education vision that will be transformational in order to reach the goals of ESD. The need for instructors to obtain these competencies accentuates that the integration of sustainable development in maritime education must be all encompassing and requires coherence from the management level down to students.

2.9. Proposed SD model

After the elucidation of the SD concept, and the overview of its essential attributes, particularly for ESD in higher education, this study proposes an assessment model that will serve as a tool for measuring an institution’s integration of SD. According to Tumbas et al. (2015), previous empirical and theoretical studies depict different ways in which HEIs can be involved in or integrate SD including through operations, education, research, planning, management etc. The literature used in this research study indicates recurring themes that appear in relation to the integration of SD in HEIs. As such, these themes were used to develop a model that will serve as a tool to measure how SD has been integrated to the institution serving as a case study. This model should also assist in achieving a measurement that is standardised across the South African MHEIs because Calitz et al. (2016) argue that the lack of integration thereof has a ripple effect on the sustainability reporting by the South African HEIs largely due to lack of comparability and established standards. According to Bosire (2014), a government notice was issued by the DHET stating that all public HEIs in South Africa were to produce an annual sustainability plan starting in 2015; however, the reporting has not been effective because the integration of SD itself is still a challenge with no clear indicators established or measurable variables established. As such, the SD initiatives vary with each institution.
The main measurable variables from the literature review towards the integration of SD in an institution are identified as:

- SD policy and governance – vision and mission of the institution, SD embedded in key institutional functions and operations.
- Curriculum - presence of SD principles and practices in academic programs, teaching and learning outcomes, content and delivery of subjects.
- Research – research within the institution focusing on different aspects of SD.
- Industry collaboration – working with the industry stakeholders for sustainability work.

Figure 2 below illustrates these identified themes as the previously listed measurable variables. These themes focus on different activities from achieving ‘green’ campus status, running distinctive courses to enabling collaborative research avenues. However, the literature also indicates the need for SD to become embedded in academic activities and organisational focus hence the need to rethink the curriculum.
It could be argued that these specific variables complement one another and show that sustainability goes beyond being a collection of significant problems but it also involves how those issues are interconnected (Tumbas et al., 2015). It can further be argued that the use of a model for these identified variables could assist higher education institutions to gain from clear indications that enable comparison with other institutions and promote the discovery of best practices by implementing a uniform sustainability evaluation methodology. In addition, the findings from such an analysis should provide a solid foundation for developing new policies or amending those that already exist.
In contrast, Tumbas et al (2015) identified education, university operations, external community and research as forming the elements for achieving sustainability in higher education as depicted in Figure 3. The authors derive these elements from the definition of a sustainable university by Scoulus (2010, p. 6208) who states that a university that makes a contribution to SD is a “university which is able to deliver the message of integration and progress in all aspects of SD, to promote socially just, economically prosperous and environmentally benign development, through the concepts, principles and methods of ESD”. This definition focuses on the basis of sustainability as ‘people, planet, profits’ (triple bottom line), therefore suggesting that an integration of SD should focus on these three areas for analysis through ESD. Through this definition it is possible to recognize the common integration areas such as the curriculum, governance, operations and processes.
2.10. Chapter summary

This chapter provided an overview of the concept of sustainable development with a specific focus on ESD as concept that is embedded in SDG 4, quality education. For the purpose of this study, the author deemed it necessary to define the concepts maritime education and training because of the nature of maritime education in South Africa which was elaborated under the discussion for ESD within the South African context. In the literature it was shown that national frameworks for sustainable development play a critical role in offering guidance and influencing the making of other decisions that are important in society, in this case, sustainable development. The literature further showed that these frameworks inform the decisions that are taken in MHEIs in relation to policies that they adopt in order to implement the objectives of sustainable development.

The curriculum theory was discussed as a tool for guiding the curriculum planning and curriculum development process. Decisions regarding curricula influence the entire teaching and learning process. Consequently, the same process ought to be undertaken in the integration of maritime sustainable development. The literature further showed that various elements must be taken into consideration for sustainable maritime development in MHEIs which are the management in terms of policies adopted, the curriculum, the educators having the adequate competencies to teach ESD and the methods of delivery. The chapter concludes by proposing an SD model for measurable variables towards the integration of SD in MHEIs.
Chapter Three
Research Methodology

3.1 Introduction
The previous chapter discussed the literature underpinning this research study. This chapter discusses the research methods that are used to collect data in order to help answer the research questions and achieve the research objectives. To recall, the research questions of this study are:

- How is sustainable development currently integrated in maritime higher education in the institution?
- What are the existing challenges for a more comprehensive integration of sustainable development curriculum in maritime higher education?
- How can change towards improvement be adopted by MHEI in relation to ESD?

It is vital that in any research study undertaken that the adequate methods be used so that the researcher will obtain results. Every study is predicated on some philosophical assumptions about what makes up ‘valid’ research and establishing research methods that are acceptable for knowledge development in a particular study (Antwi & Hamza, 2015).

3.2 Research approaches
Grover (2015, p. 01) defines a research approach as “plans and the procedure for research that encompass the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation”. Research approaches are, therefore, used by the researcher to establish a step by step approach in gathering data and using the obtained data to develop thoughts in relation to the proposed research problem. A researcher can use different research methods such as qualitative, quantitative as well
as mixed-methods, as shown in Figure 4. The nature of the study determines the research method that can be used to conduct the research study.

**Figure 4: Comparative view of approaches**

<table>
<thead>
<tr>
<th></th>
<th>Quantitative</th>
<th>Mixed methods</th>
<th>Qualitative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nature of data</strong></td>
<td>Variables</td>
<td>Mix of variables, words, images</td>
<td>Words, images, categories, patterns</td>
</tr>
<tr>
<td><strong>Data analysis</strong></td>
<td>Statistical relationships</td>
<td>Quantitative symptoms and qualitative support</td>
<td>Search for patterns, themes and holistic features</td>
</tr>
<tr>
<td><strong>Results</strong></td>
<td>Generalizing</td>
<td>Corroborated findings may generalize</td>
<td>Particularistic findings Representation of insider i.e. ‘emic’ view point</td>
</tr>
<tr>
<td><strong>Final report form</strong></td>
<td>Statistical report</td>
<td>Eclectic and pragmatic</td>
<td>Narrative even with direct quotations of research participants</td>
</tr>
</tbody>
</table>

Source: Grover (2015)

Qualitative research is a process of in-depth inquiry used by the researcher when seeking to understand a social phenomenon or research problem. Taylor (2016, p.16) defines qualitative research as a method that “refers in the broadest sense to research that produces descriptive data - peoples own written or spoken words and observable behaviour”. This approach mainly focuses on answering the ‘why’ of the phenomena being studied and relies on the participants’ actual experiences (Ahmad et al., 2019). The findings enable the researcher to obtain better understanding in that particular field of study. However, this approach does not make use of statistical data and analysis procedures. As such, this approach then makes use of data collection methods such as interviews, case study, focus groups, grounded theory and observation.

Quantitative research on the other hand makes use of statistical procedures. The approach collects and analyses data that is quantifiable through numerical representation and assumes that all knowledge can be quantified, which is not always the case (Suri & Clarke, 2009 as cited in Bacasdoon, 2021).
The mixed-methods approach is the third approach available to a researcher. As the name suggests, this approach makes use of both qualitative and quantitative approach. Sekaran and Bougie (2016) states that mixed methods research is focused on collecting, analysing, and combining both qualitative and quantitative data in one study or a longitudinal study. The purpose of using this research method is solving research questions that the qualitative or quantitative approach alone cannot answer. Therefore, the combination of these two approaches, helps provide an enhanced understanding of the research problem. Enosh et al. (2014 as cited in Dawadi et al. 2021) posit that using mixed-methods permits the researcher to answer research questions with enough depth and the researcher is enabled to generalise the findings to the larger population. This is largely because the potential advantages of each approach are maximised in a single research. For instance, with the quantitative approach, the researcher can collect data from a large sample which means the findings can be generalised to a broader population whilst with the qualitative approach deeper understanding on the participants’ responses.

A mono-method is used in this study which is the qualitative approach. This was used as the main approach for data collection because the researcher sought to ascertain whether SD is comprehensively integrated into South African higher education, MHEIs particularly and whether there are challenges currently hindering this integration. The researcher deemed the qualitative approach adequate for this study considering its ability to afford the researcher deep enquiry.

### 3.3 Data collection methods

Data collection forms a vital aspect of a research study. The research approach employed in a research study determines the type of data that will be collected hence the data collection method adopted. This study makes use of semi-structured interviews as the main data collection instrument. A semi-structured interview is identified as qualitative research and contains a predetermined list of open ended questions to be asked to the interviewee. Jamshed (2014, p. 87) states that “semi-
structured interviews are based on semi-structured interview guide, which is a schematic presentation of questions or topics and need to be explored by the interviewer”. Interviews are facilitated by the researcher with the purpose of acquiring data relevant to the study. The advantage of using this data collection method is that there is predetermined information needed by the researcher and allows the researcher to compare responses from the data collected whilst being free to probe should more information be required and reading the non-verbal communication of the interviewees such as body gestures and speaking pauses.

In addition, this research made use of secondary data. Analysing the relevant literature and doing desktop research, the researcher was able to determine whether at the macro-level (governmental) South Africa does embrace SD and whether at the institutional level, the HEIs do have an existing policy for SD or related initiatives. The author read academic journals and government gazettes on the subject of SD in higher education as well as reports from the targeted institutions and the DHET.

3.4 Case description
The institution presented as the case study is a South African HEI that has five campuses located in KwaZulu-Natal with a student body exceeding 45 000. The campus that was used as the study site for this research is the official address of the institution and houses the office of the Vice-chancellor. For ethical reasons in directly identifying the institution as per the Protection of Personal Information Act (POPIA) Code of Conduct for public universities in South Africa, the name of the institution was withheld. The institution is characterised by different disciplines including maritime studies which had the target population of this research study. This institution was a legitimate study site because it offers different maritime-related courses at undergraduate and postgraduate level in the Maritime Law and Maritime Studies Unit.
3.5 Target population and sampling

A researcher gathers data or collects information from the sample population for contribution to academic knowledge or accomplish their research endeavour. Asiamah et al. (2017), state that the participants are part of the population targeted for the research study due to traits that the researcher is interested in. The target population for this study were the staff and students from a MHEI in South Africa. This population is characterised by bachelor degrees or equivalent qualifications and postgraduate programs in maritime education – non-vocational qualifications in the Maritime Law and Maritime Studies Unit, under the College of Law and Management. The aim was to obtain institutional responses as well as student responses.

This study is targeting different maritime qualifications from the identified MHEIs, therefore, makes use of unrestricted or simple random sampling. Sekaran and Bougie (2016) identify two types of probability sampling that a researcher can use to gather data; unrestricted or simple random sampling and restricted or complex probability sampling. Simple random sampling means every member or element of a population has the same chance of being included in the sample, and all possible samples of a given size have the same chance of being selected (West, 2016). The probability of selection for each member in the population is one, which allows all members an equal chance for selection. This makes this approach to have less bias and the findings more generalizable.

For the staff on the other hand, purposive sampling was used. “The purposive sampling technique, also called judgment sampling, is the deliberate choice of a participant due to the qualities the participant possesses. It is a non-random technique that does not need underlying theories or a set number of participants” (Etikan et al., 2016, p. 02). Simply defined, the researcher chooses what information is necessary to have and then searches for sources willing and able to supply it based on their knowledge or experience. It is frequently used in qualitative research to find and pick the instances with the most information so that the resources are used as effectively as possible. This entails identifying and choosing individuals or groups of individuals who are
knowledgeable and skilled about the interest phenomenon (Patton, 2002). Therefore, the staff members consisted of lecturers, research coordinators and departmental management.

3.6 Data analysis
This section discusses data analysis methods that will be employed for the qualitative approach and data collection method used.

*Qualitative data analysis*
The data that was gathered through the semi-structured interview was analysed using content analysis through the NVivo 12 software to obtain institutional insights on the integration of sustainability in maritime education. The researcher organised the data according to the themes that corresponded to the research questions. The researcher then fitted responses from the interviews as well as the documents into these themes. The themes were in correspondence with the identified research questions. The researcher analysed the interview responses then assigned codes. New codes were added by the researcher for when the codes already made did not fit with a specific response.

The study further makes use of the content analysis. Braun and Clarke (2006) are of the argument that qualitative research has two categories, with the first category relating to analytical approaches that are linked to a framework or model and the second category is not constrained to frameworks but more experiential and independent. The authors further state that content analysis is part of the first category. Content analysis enables the researcher to identify and interpret the meaning of data by separating data that represent important concepts or information and applying or using it to create a framework in order to organise the data in a manner that can be used to explain or describe a particular phenomenon (Kleinheksel et al., 2020). In the instance of this study, the framework was developed from the used literature so the data will be used to determine whether the findings complement or deviate from the
used literature. As such, the analysis will assist the researcher to identify new themes that may be used to make recommendations and enhance the model.

3.7 Development of research instrument

This research study adopted the survey questionnaire and semi-structured interview questions used in the IAMU 2019 research project titled ‘a critical analysis of the integration of the sustainable development principles and practices in maritime higher education institutions’ (SDiMET) by WMU. For the survey questionnaire the SDiMET project explored different aspects with the research instruments including facilities and operations, curriculum and teaching practices, research and innovation etc. This research study however, focused on the aspects of curriculum and teaching practices to obtain the perspectives of students on the courses they are enrolled in – the provided courses from the staff respondents, the SD governance to determine whether the institutions do have strategic tools in place that encourage the integration of SD and lastly, the involvement of students in relation to research and innovation and how the institutions have platforms that enable students to participate. The researcher focused on these aspects in alignment to this study’s research objective and the model developed as indicated in Chapter two.

Prior to the collection of data, the literature review gave a scope into the phenomena of interest with the South African higher education landscape hence the focus on exploring the above-mentioned themes. The overall literature review indicated the gap in literature towards the discussion of SD in relation to MHEIs specifically.

3.8 Ethical considerations

The WMU Research Ethics Committee's rules and guidelines concerning human participation in data collection were followed. The adequate documents were submitted to the Committee and approval was granted for the survey questionnaire,
semi-structured interview guide, information sheet and the consent forms for both instruments. The data was collected with emphasis on the consent and safety of respondents – complying with the principles of research ethics such as obtaining the informed consent of participants, being honest as a researcher and making the respondents feel safe in participating in the research study. The respondents were reaffirmed through the informed consent form that participation is voluntary and the collected data will be treated with anonymity and confidentiality. Finally, the data will be securely deleted once the study is concluded.

3.9 Study limitations
Due to the difference in locations and difficulties in obtaining the permission to collect data in the identified institutions in South Africa, the researcher was not able to reach the targeted number of participants. Initially, this research study targeted four HEIs and aimed to make use of the mixed-methods approach to maximise the student and institutional responses. As a result of the delay, the research study moved from being a broad case study of South Africa to specifically focusing on one institution that granted the Gatekeepers permission. However, due to lack of responses in the institution identified as a case study, the qualitative approach became an appropriate method that still afforded the researcher the kind of data that could still be used to answer the research questions.

Regarding access, the researcher was not permitted to directly make contact with the students and staff but relied on the response emanating from the institution uploading the research instruments in the internal notice system. Being able to collect data from all four institutions would have afforded the researcher the ability to make comparison between the institutions and identify best practise from each institution to determine how change towards improvement can be adopted as applicable.
3.10 Chapter summary

This chapter discussed the detailed application of the research methodology adopted in this study. The research approach employed was qualitative. The semi-structured interview is the research instrument used for data collection supplemented with document analyses. The chapter was concluded by discussing data analysis and the ethical considerations. The next chapter, presents the findings obtained through the application of the discussed research methods.
Chapter Four
Results, Analysis and Discussion

4.1. Introduction
This chapter presents the results from the gathered data and discusses the research methodology as well as the data collection methods as outlined in the previous chapter so as to address this study’s aim and research questions. All quotations reproduced from the interviews are intelligent verbatim meaning the researcher in this case made subjective decisions during the transcription process on what to put in or exclude, correcting mistakes and editing grammar as well as repetitions (McMullin, 2021). As highlighted in the first chapter, the aim of this research paper is to analyse the relationship between sustainable development curricula and MET in South African MHEIs.

4.2. Response rate
The participants of this study are all from the same South African institution and are made up of five staff members and five students doing maritime studies and maritime-related courses at undergraduate and postgraduate level. Due to the nature of the methodology adopted, 10 participants were deemed an adequate number supplemented by documents from the university. All participants are based in the Unit of Maritime Law and Maritime Studies, under the College of Law and Management.

4.3. Results
The findings are presented in a tabular format containing the themes, explanations as well as quotes from the participants. The findings are presented according to each research question as discussed in the first Chapter. The responses are categorised according to the themes proposed in the model (Fig.2 in section 2.9) and are further aligned to the research questions.
4.3.1. Research Question 1: How is sustainable development currently integrated in maritime higher education in the institution?

The first research question of this study sought to identify how the institution is currently integrating SD in different aspects which are embedded in the identified themes in the model developed in Chapter two. The themes are also indicated in Table 4.1 below. The responses were then grouped according to the befitting theme. The participants are identified as X for the staff respondents and Y for the student respondents (Appendix 4).

Table 4.1: A summary of the responses from the online semi-structured interviews aligned to RQ1

<table>
<thead>
<tr>
<th>Themes</th>
<th>Explanations</th>
<th>Quotes</th>
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<tbody>
<tr>
<td>SD Policy/ Governance</td>
<td>The staff respondents all indicated that the institution does have requirements to consider SD in different aspects whilst 4 out of 5 students indicated the presence of SD related concepts and principles as well as in the operations of the institution. The findings also indicated an unclear understanding of the existence of the institution’s SD policy giving the impression that SD is still an ambiguous concept that is not clearly understood.</td>
<td>Respondent X1 stated that, the university does not have a sustainable development policy per se but rather integrates programs and projects that endorse and promote sustainable development. Respondent X3 on the other hand stated that, the institution does not have a sustainable development policy but this is only implemented at the curriculum level or stage. Respondent X4 on the other hand stated that,</td>
</tr>
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</table>
communicated or understood by the different levels of staff.

<table>
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<tr>
<th>Curriculum</th>
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| The findings showed that the institution does integrate SD principles and concepts at the curriculum level. The staff respondents all indicated that the most applicable integration of SD in the curriculum is ‘adding SD knowledge elements to existing subjects’. Similarly, a majority of the student respondents agreed that the institution should ‘effectively promote SD principles and operations in curricula. And 4 out of 5 students indicated that high-level priority should be given for SD in respect to the ‘curriculum and student learning outcomes’.

Yes, it’s not easily accessible however, it’s eluded to in different presentations. It’s just not easily accessible.

Respondent Y5 stated that, the university shows commitment to SD through practises such the use of solar power for electricity and initiatives such as the Green Campus Initiative that aims to make the university more environmentally friendly.

Respondent X3 stated that, No, this is only implemented at the curriculum stage or level.

Respondent Y4 stated that, I think that to ensure that the students become change-makers for sustainability within the maritime industry, it is rather important that curriculum rethinking be considered as this will enable students to obtain certain knowledge that enables them to participate in curbing SD issues.
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<tr>
<th><strong>Research</strong></th>
<th>A majority of the respondents indicated that the institution supports research in sustainability with funding and that the research conducted focuses on different aspects of SD. All the staff respondents indicated positive response in this aspect whilst 4 out of 5 student respondents indicated that the institution is committed to SD through its research initiatives on SD. The results further gave an insight that a majority of the research funding primarily available to students and researchers is from the National Research Foundation (NRF).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Respondent X4 on whether the institution supports research in sustainability with funding stated that, *[the university] awards scholarships to deserving students whose research focus is centred on SD. It also sponsors students attending and presenting papers at conferences focusing on SD. The respondent further indicated that, the institution currently has 8 theses for Doctoral degrees focusing on SD as well as 36 dissertations for Masters degrees focusing on SD.</td>
</tr>
<tr>
<td></td>
<td>Respondent X1 stated that, *[the university] currently has these research projects; Integrated Renewable Energy Advancement Programme (IREAP), the Mechatronics and Robotics Research Group - specifically focusing on climate change, Sustainability solutions for the Isimangaliso's St. Lucia estuarine lake etc and these projects are</td>
</tr>
</tbody>
</table>
supported by the National Research Foundation which awards scholarships and bursaries to qualifying and interested students. The most recent being the [the university] Maritime Research Initiative a result of the collaboration with EThekwini Maritime Cluster which sponsored 5 postgraduate students who do maritime-related research with topics that currently affect the South African maritime industry.

Respondent Y5 on whether the institutions research focuses on different aspects of SD stated that, *Yes, the focus mostly depends on the specialisation and an offering of the qualification level.*

<table>
<thead>
<tr>
<th>Industry Collaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>The findings indicated that the majority, 4 out 5 of the staff respondents find the institution to be collaborating with the industry for sustainability work and this is evident through the different engagements that the institution has with industry partners.</td>
</tr>
</tbody>
</table>

Respondent X1 stated that, *Yes. The university has various partnerships including the high level collaborations with WHO and UNEP on the Intergovernmental Panel on Climate Change and the Environmental Fluid*
Mechanics Lab in partnership with the Department of Science and Innovation. The other platform for collaboration is the Annual Environmental Sustainable Action and Community Development in partnership with non-profit education development organization Centre for the Advancement of Science and Mathematics Education (CASME).

This respondent further indicated that,

...The most recent being the [the university] Maritime Research Initiative a result of the collaboration with EThekwini Maritime Cluster which sponsored 5 postgraduate students who do maritime-related research with topics that currently affect the South African maritime industry

X4 stated that,

Yes, it does. [the university] has partnered up with the Centre for the Advancement of Science and
4.3.2 What are the existing challenges for a more comprehensive integration of sustainable development curriculum in maritime higher education?

This research question was used to ascertain the challenges faced by the institution concerning the integration of SD as perceived by the staff and students. On the research instrument one question focused on the challenges; however, the responses on the other questions gave an insight into different challenges existing for the institution which were then presented and categorised according to the themes except for the ‘research’ theme which did not have corresponding responses. This is shown in Table 4.2 below:
Table 4.2: A summary of the responses from the online semi-structured interviews aligned to RQ2

<table>
<thead>
<tr>
<th>Themes</th>
<th>Explanation</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD Policy/ Governance</td>
<td>Regarding the challenges on the integration of SD, 2 out of 5 respondents indicated that the challenges are mainly related to governance and the introduction of an SD related policy. The responses indicate that the lack of integration into the institution’s vision and mission negatively impact translation of SD principles and procedures into the institutions objectives and core missions. For the student responses, 4 out 5 student respondents indicated uncertainty on whether the institution is committed to SD through its vision and mission statements whilst all the respondents indicated not being aware of an existing SD-related policy.</td>
<td>Respondent X1 on whether there is good planning with targets that are meaningful and achievable for SD stated that, <em>I would not say there is a clear and good planning because SD is not directly reflected in the university's mission, vision and strategic goals.</em> Similarly, respondent X3 simply stated, <em>Not at the current moment.</em> Respondent X4 also states that, <em>there aren't any meaningful targets as it does not form part of the institutions vision and mission.</em> Respondent Y1 stated that, <em>I am not certain on the existence of a SD policy but the university</em></td>
</tr>
</tbody>
</table>
Concerning the integration challenges as perceived by the respondents, the findings indicate that SD is considered to be challenging when translated to non-vocational subjects hence it is not clear on how SD can integrated into the curriculum in a similar manner or how the institution have students achieve the same level of understanding. The findings further indicated that the limited understanding of the SD concept and its dimensions may further contribute to the challenge of achieving SD related objectives within the institution.

Respondent X1 stated that,
Yes. SD is more evident in some subjects than others because for instance, in the STEM subjects it is easier to make SD related concepts more practical compared to the non-vocational subjects.

X1 on whether there is understanding of SD including the appreciation of its different dimensions stated that,
Yes, but the understanding may be limited for both staff and students. This may be more applicable to the disciplines that have sustainability integrated subjects.
Industry collaboration

One response in relation to obstacles indicated that lack of meaningful partnerships or support from stakeholders also is a potential challenge in hindering the achievement of SD objectives.

X4 stated that,
Yes, probably lack of buy-in from relevant stakeholders.

4.3.3 How can change towards improvement be adopted by the MHEI in relation to ESD?

In relation to the identified challenges, this research question sought to identify in which aspects and how can change towards improvement be applied. Three questions on the research instruments were used to help answer this research question. The same process was used to present the findings; the responses of the participants were grouped according to the themes as shown in Table 4.3.

<table>
<thead>
<tr>
<th>Themes</th>
<th>Explanation</th>
<th>Quote</th>
</tr>
</thead>
</table>
| SD Policy/ Governance | Regarding how the implementation of SD can be improved in MHEIs, the respondents indicated the need for SD to be embedded in the institutions core activities by having SD principles and concepts reflected in the institutions vision and mission statement. | Respondent X1 stated that,
*Good planning such as integrating it to the university's strategic goals as this will ensure that it is thoroughly implemented down to the operational level.*

Respondent X4 stated that,
| Curriculum | Two of the five staff respondents indicated that curriculum is one aspect that can be used to improve the implementation of SD in MHEIs. Similarly, all the students indicated that integrating SD principles and concepts is important and this should be further included in the academic programmes. | Respondent X3 stated that, 
*There is an urgent need for sustainable development to move from its level of theory and be aligned to the practicalities. This can be done by incorporating sustainable development in a majority of academic or qualification offerings in higher education. This is to ensure that there is a sense of an essence of accountability and participation towards the achievement of the United Nations sustainable development goals and overall agenda.*

Respondent X4 stated that, *it should be included in the curricula and it should form part of the institutions vision and mission.* |
<table>
<thead>
<tr>
<th>Research</th>
<th>One staff respondent and one student respondent indicted that research can be used to improve the implementation of SD in the institution. The respondents argued that the institution is well-positioned for SD research and has the potential of using this to further explore SD dimensions for solutions on current challenges.</th>
<th>X5 stated that, <em>it can be improved through continuous provision of funding for research on SD</em>. Respondent Y2 stated that, <em>I would say that research particularly because [the university] thrives on research and is highly ranked in the country so if [the university] uses something that is already thriving and is well-resourced in, this element can then be used to improve the implementation of SD</em>.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry collaboration</td>
<td>The respondents indicated that by collaborating with the relevant industry stakeholders, the institution can address complex SD issues through access to knowledge and resources.</td>
<td>Respondent X4 stated that, <em>by imparting more information on the importance of SD integration on the MHEIs and working with different stakeholders within the industry for the exchange of knowledge and understanding of the industry’s needs in terms of SD</em>.</td>
</tr>
</tbody>
</table>
Respondent Y4 stated that, 

*I think if focusing on the nature of SDGs firstly, collaboration plays an important role in achieving the goals and targets so the same is true of the institution. Partnering with the adequate stakeholders can help pool more resources and information to establish projects that will contribute to the achievement of targets.*
4.4. Discussion
This section discusses the findings in relation to the literature used in this study. The results from the data mainly indicated responses that aligned to the themes that were identified and presented through a model. Figure 5 attempts to depict overall measurement of the institution over the proposed assessment model according to the results obtained. This is further elaborated in the following discussion. The numerical values in Figure 5 are hypothetic non-empiric values that are only used for indicative purposes of the overall results.

Figure 5: SD integration level

4.4.1. SD policy and governance
From the data it can be deducted that the institution has attempted to integrate SD in its operations through the use of renewable energy, SD elements in the courses undertaken by students, and research projects that promote SD. However, the results
also revealed that from a governance and policy perspective, the institution does not have specific policy dedicated to SD. This is reflected in the argument by Lotz-Sisitka (2016, p. 93) that in the case of South Africa, “ESD policy intentions of UNESCO were never consolidated explicitly as ESD policy at a national level, but rather, elements of the ESD agenda were reflected in the more dominant post-apartheid social and environmental justice interests of national discourses established in the early-mid 1990s…”. This result is consistent with the findings from the literature used in this study that HEIs because of their positioning and the role played in society of producing knowledge for sustainability for wider-use, that HEIs regardless of the non-existence of SD specific policies they are compelled to integrate elements of SD in daily campus operations, research initiatives, teaching and learning activities.

4.4.2. Curriculum

The findings indicated the integration of SD concepts to already existing subjects rather than having stand-alone SD programmes is more applicable to the institution specifically in the Maritime Studies unit. The document titled Environmental Research Projects at [the university] indicates that the offering of academic environmental programmes is largely from the College of Agriculture, Engineering and Science ranging from undergraduate to postgraduate level. The College of Law and Management offers a coursework LLM programme in Environmental Law with modules such as International Environmental Law and Pollution Control Law. This finding attests to what some respondents indicated that the nature of some courses permit for a more practical and comprehensible integration of SD concepts such as this response:

Yes. SD is more evident some subjects than others because for instance, in the STEM subjects it is easier to make SD related concepts more practical compared to the non-vocational subjects.

Interestingly, a majority of the respondents on how the implementation of SD can be improved in the institution mainly mentioned an action of improvement centred on
curricular activities. This aligns to the literature used in this study suggesting that reconsidering the curriculum is one of the pivotal activities for an institution to work towards integrating sustainability.

4.4.3. Research
The findings from the document analyses indicate that the institution is invested in undertaking research with specific projects and bursaries dedicated to SD as an attempt to provide solutions to SD challenges. The research projects document reveals that two of the institution’s campuses are built inside nature conservancies, signifying the that the institution is committed to sustainability as per the responsibility that comes with the protection of areas that are viable ecologically. The document, same with the results, reveals that the institution has thirteen currently ongoing environmental research projects with different partnerships from the private and public sector.

Also, the university’s Research Policy II that came into effect in January 2014 and was reviewed in January 2018, reveals that the institution prioritises developing its research outputs by investing in young researchers and creating an enabling environment for these researchers to produce quality research. This is illustrated, as an example, from a quote from a respondent:

*The future of the University depends on the pool of young researchers from whom future research leaders will emerge. The University works hard to attract such young researchers and addresses their needs so that it provides a suitably enabling research environment.*

4.4.5. Industry collaboration

As indicated in the previous theme, the institution leverages collaborative partnerships for research projects and to further develop more objectives as the need arises. It is worth highlighting that these research projects are not under the Unit of Maritime Law and Maritime Studies except for the [the university] Maritime Research Initiative. This
suggests that prior to the collaboration between the university and the eThekwini Maritime Cluster to fund postgraduate students as respondent X1 indicated, there was no research programme that was aimed solely for maritime research students. This is evident of what has been alluded to in the literature used in this study that for a majority it is easier to integrate SD to more technical disciplines in comparison to academic disciplines hence more SD research projects. Nevertheless, these research projects depict the importance of collaboration for work towards sustainability and bridging the gap between theory and practise as well as developing solutions to SD challenges.

An interesting finding was that the university engages in capacity building to empower the staff in alignment to competencies for SD. Respondent X4 stated that,

*continuous professional development of human resources on SD is present at [the university]. The institution promotes research related to sustainable development and this promotion is encouraged through scholarships. The institution also conducts continuous development in its HR through seminars that provide guidance on SD and through cross-disciplinary conferences that focus on education for sustainable development*  

Correspondingly, the Research Policy II reveals that,

*To support its research endeavours, the University continuously builds a research support system, research administrative processes, financial and human resource policies and processes, which are non-bureaucratic, user-friendly and enabling. These will be administered by well-trained, caring support staff that share the pride of the academic staff in the academic success of the University, and see themselves as contributing to it.*

This signifies the importance of training those who work in the institution so that they share the same vision in alignment to the principles of SD. The same is applicable to lecturers being trained for integrating ESD principles in teaching and learning.
4.5. Chapter Summary

In this chapter, the results, analysis and discussion were presented the findings in alignment to the methodology chapter. Some of the findings concurred and some contradicted with the literature presented in chapter two. Regarding the SD Policy and governance, it was found that the institution does not follow a structural approach on the integration of SD principles and procedures but rather has research initiatives that are seek to explore and provide solutions to SD challenges. Regarding the curriculum, it was found that the maritime-related courses reflect some SD principles and concepts whilst the other disciplines offer stand-alone SD programmes. For the research theme, it was found that the institution prioritises research with a number of ongoing research projects entirely dedicated different SD dimensions whilst funding for students and staff pursuing SD research is made available. Lastly, with regards to industry collaboration, the results reveal that the institution is engaged in different collaborative partnerships, also evident in the high number of research projects. The results further show that the institution still has room for improvement particularly with the implementation of an SD policy. The following chapter provides the recommendations and conclusion for this research study.
Chapter Five
Recommendations and Conclusion

5.1. Introduction

The purpose of this chapter is to discuss whether the objectives of this research study were met, provide recommendations based on the findings as depicted in the previous chapter as we as conclude on the overall study. The aim of this research study was to analyse the relationship between sustainable development curricula and MET in the South African MHEI used as a case study and develop an assessment model. This aim there enabled the researcher to also review the extent to which a sustainability curriculum has been introduced or integrated into the current MET courses offered. The recommendations provided are based on these findings and will hopefully assist the university and other MHEIs in using the identified measurable variables in the integration of sustainability in the curriculum.

5.1.1 Research objective 1:

To determine how sustainable development is currently integrated into maritime higher education courses in the institution.

The purpose of this objective was determine whether SD currently forms part of maritime education and how SD has been integrated. This was achieved by having questions in the research instruments that would assist in achieving this objective. The findings from the data collected and supporting documents from the institution revealed that although there is no SD present at the strategic level, the institution focuses on integration by introducing SD principles and concepts in some of the courses, green campus operations as well focusing on research output with SD inspired solutions. This is also reflected in the institution’s interest to train the academic staff in SD principles and concepts. Therefore, this objective was met because the
researcher was able to ascertain the academic programmes that focus on sustainability both within and outside the maritime unit, the research projects initiated for ESD as well as the key collaborative partners.

5.1.2. Research objective 2:
To ascertain the existing challenges for a more comprehensive integration for the sustainable development curriculum in maritime higher education.

The purpose of this objective was to establish whether the institution is facing any obstacles that hinder the integration of SD comprehensively. The findings revealed that contrary to the indication in literature that most HEIs encounter challenges such as the lack of stakeholder buy-in when it comes to SD research projects, the institution at hand proves to have a number of on-going and successful SD research projects as depicted in the institutions documents. However, there are also findings which are consistent with the literature used in this research study such as the lack of clear integration of SD at the strategic level, the integration of SD in non-vocational academic programmes therefore, suggesting that the adequate imparting of knowledge for these programmes is hindered. This objective was achieved because through the responses the researcher was able to identify and decipher the existing challenges for the institution.

5.1.3. Research objective 3:
To discuss the change towards improvement that can be adopted by the MHEI in relation to ESD.

The purpose of this research objective was to determine how the challenges identified in the previous research objective and identified by the researcher in the responses of both student and staff can be improved. The findings revealed that the university can leverage on its ‘research institution status’ for more research projects that are maritime specific. The findings further revealed that as a result of lack of SD mention at the
vision and mission statement level of the university, there is lack of detailed planning, policies and guidelines in the implementation of SD.

**5.2. Recommendations**

In light of the results and analysis provided in the previous chapters, this research study makes recommendations for the South African MHEIs.

The overall findings indicate that the institution has made quite some progress in the integration of SD; however, there is still scope for improvement. According to the findings, the institution has initiated quality research projects in terms of addressing SD challenges. However, research by itself is not the sole variable in which SD can be integrated in MHEIs but should function in tandem with other factors as illustrated in the measurable variables model. This is largely reflected in the position of Leal Filho et al. (2017 cited in the GUNI report, 2019, p.12) that, “even though many universities have started to lead the way with different initiatives, many of those efforts address only one or two of the sustainability domains at HEIs, which continue to foster compartmentalization, instead of a holistic approach”.

<p>| 1. SD policy and governance | In reference to the literature and the findings that the institutions approach to SD is not structured, the introduction of an SD policy is recommended because the presence of policy and procedures will encourage an enabling environment and put a sense of responsibility and accountability on the institution concerning the integration of SD. This further compels the institution to constantly review its plans and strategies as well as identify areas that need change. |</p>
<table>
<thead>
<tr>
<th>2. Curriculum</th>
<th>It is recommended that the institution shifts from equating SD to specialist programmes by introducing courses that can be done interfaculty in order to foster interdisciplinary and multidisciplinary engagement. This will assist in achieving balance for the academic programmes that are non-vocational in nature.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Research</td>
<td>In light of the discussion in previous chapters and results, similarly to the curriculum aspect, it is recommended that the institution also initiate research programmes and projects that encourage interfaculty collaboration for SD. This will further enable the university to reflect on its priorities that span the boundaries of disciplines.</td>
</tr>
<tr>
<td>4. Industry collaboration</td>
<td>Collaboration is encouraged by the UN to reach the targets of the SDGs, so should MHEIs that aim to make a contribution to SD challenges. In the case of this institution it is recommended to increase the research collaboration with regards to maritime research.</td>
</tr>
</tbody>
</table>

### 5.3. Future research

In relation to the limitations mentioned in chapter three, for future research, it is recommended that:

- Face-to-face interviews and personally administered survey questionnaires are recommended as well as a bigger sample size.
- The use of two or more institutions to enable a comparative analysis.

In respect to exploring the research topic itself, it is recommended that future research could use the model developed in this research study to assess the integration of SD in
other South African MHEIs and how the variables in the model could be further used for sustainability reporting.

5.4. Conclusion

From the overall findings of this study it can be deduced that the institution meets the requirements for integrating sustainability in the curriculum with improvements needed. According to the model developed to serve as a measuring tool, the variables are present in the findings however, with some variables more prioritised compared to others. For instance, research as well as the industry collaboration variable had more positive responses from the participants in comparison to the curriculum and SD policy and governance variables. For the latter variable, more responses indicated the need for improvement. In agreement with the literature, the findings showed that there is still a gap in implementation when it comes to integrating a sustainability curriculum in HEIs, particularly MHEIs. As previously suggested, the model developed in this study can be used as a measurement tool for the institution as well as other MHEIs in South Africa. After a thorough analysis on the findings as well as the supporting documents provided by the institution, it can be concluded that the research aim of this study therefore was met.
References


Nhamo, G. (2020). Higher education and the energy sustainable development goal: policies and projects form the University of South Africa. In G, Nhamo & G, Mjimba (Eds.), *Sustainable development goals and institutions of higher education*. (pp. 31 – 48). Springer.


https://commons.wmu.se/cgi/viewcontent.cgi?article=1283&context=all_dissertations


https://www.researchgate.net/publication/280092859_Sustainable_University_Assessment_Tools_Factors_Measures_and_Model

https://sdg4education2030.org/the-goal


https://en.unesco.org/themes/education-sustainable-development/what-is-esd

https://maritime.ukzn.ac.za/programmes/postgraduate-diploma-in-maritime-studies/

UKZN. (2014). POLICY ON DEVELOPING, RETAINING AND REWARDING RESEARCHERS (RESEARCH POLICY II).
https://coh.ukzn.ac.za/college-office/finance/university-policies-procedures/

https://www.unep.org/fr/node/10690


https://doi.org/10.31704/ijocis.2021.012

https://www.sciencedirect.com/science/article/pii/S2666683921000195
Appendices

Appendix A: Consent form and semi-structured interview for staff

Dear Participant,

Thank you for agreeing to participate in this semi-structured interview, which is carried out in connection with the dissertation which will be written by the interviewer, in partial fulfilment of the requirements for the degree of Master of Science in Maritime Affairs at the World Maritime University in Malmo, Sweden.

The topic of the Dissertation is Integrating a Sustainability Curriculum Within Maritime education: Case Study of South Africa

The information provided by you in this interview will be used for research purposes and the results will form part of the dissertation, which will later be published online in WMU's digital repository (maritime commons) subject to final approval of the University and made available to the public. Your personal information will not be published. You may withdraw from the research at any time, and your personal data will be immediately deleted.

Anonymised research data will be archived on a secure virtual drive linked to a World Maritime University email address. All the data will be deleted as soon as the degree is awarded.

This study has been ethically reviewed and approved by the WMU Research Ethics Committee (Approval: REC-22-59(M)).

Your participation in the survey is highly appreciated.

Student’s name : Yamkela Nhleko
Specialization : Maritime Education and Training (MET)
Email address : w1011295@wmu.se

* * *
I consent to my personal data, as outlined above, being used for this study. I understand that all personal data relating to participants is held and processed in the strictest confidence, and will be deleted at the end of the researcher’s enrolment. I also understand that my participation is voluntary and can withdraw from the study at any stage should I feel uncomfortable.

Name: ..............................................................................................................

Signature: ........................................................................................................

Date: .................................................................................................................

11 July 2022

Semi-structured interview questions

Name (optional): ______________________

Position: ____________________________

1. Is there a requirement for your institution to consider SD in the institution’s general operations?
2. Is there a requirement for your institution to consider SD in the institution’s curriculum?
3. Does your institution have a sustainable development policy?
4. Which of the following, if any, are present in your institution: guidance on integrating SD in institutional operations or continuous professional development of human resources on SD?
5. Would you say the institution supports research in sustainability with funding?
6. Does the institution collaborate with the industry for sustainability work?
7. Does research in the institution focus on any aspects of SD e.g. the economics of SD, social implications of SD and the environmental aspect of SD?
8. With respect to the integration of SD in the educational curriculum, which of the following are most applicable to your institution?
   - We do not integrate SD in our educational curriculum
   - We add SD knowledge elements to existing subjects
   - We have stand-alone SD subjects in our programmes
   - We offer a Bachelor/Masters programme in SD
   - We do something else to integrate SD in our academic programmes
9. Do you think there is understanding of SD, including appreciation of different dimensions of SD and their interrelation?
10. Would you say the faculty/staff have awareness of SD issues?
11. Would you say the students are aware of SD issues?
12. Has your institution experienced any challenges concerning the implementation of SD?
13. Is there clear and good planning with achievable and meaningful targets for SD?
14. Is the institution structured to carry out activities for SD?
15. Do you think that the addition of SD issues to the curriculum will overload curricula in the institution?
16. How, in your opinion, could the implementation of SD in MHEIs be improved?
Appendix 2: Consent form and semi-structured interview for students

Dear Participant,

Thank you for agreeing to participate in this research interview, which is carried out in connection with the dissertation which will be written by the researcher, in partial fulfilment of the requirements for the degree of Master of Science in Maritime Affairs at the World Maritime University in Malmo, Sweden.

The topic of the Dissertation is Integrating a Sustainability Curriculum Within Maritime education: Case Study of South Africa

The information provided by you in this questionnaire will be used for research purposes and the results will form part of the dissertation, which will later be published online in WMU’s digital repository (maritime commons) subject to final approval of the University and made available to the public. Your personal information will not be published. You may withdraw from the research at any time, and your personal data will be immediately deleted.

Anonymised research data will be archived on a secure virtual drive linked to a World Maritime University email address. All the data will be deleted as soon as the degree is awarded.

This study has been ethically reviewed and approved by the WMU Research Ethics Committee (Approval: REC-22-59(M)).

Your participation in the survey is highly appreciated.

Student’s name : Yamkela Nhleko
Specialization : Maritime Education and Training (MET)
Email address : w1011295@wmu.se

* * *
I consent to my personal data, as outlined above, being used for this study. I understand that all personal data relating to participants is held and processed in the strictest confidence, and will be deleted at the end of the researcher’s enrolment. I also understand that my participation is voluntary and can withdraw from the study at any stage should I feel uncomfortable.

Name:                                                                                     

Signature:                                                                             

Date:                                                                                  

29 June 2022
Name (optional) : ______________________
Academic programme: ______________________
Course title : ______________________

1. Does your institution have an SD policy?
2. Would you say that the institution’s vision and mission statements encourage SD?
3. Does the course you are currently enrolled in prioritise SD in its curriculum?
4. In your own opinion, should Maritime Higher Education Institutions (MHEIs) effectively promote SD principles and operations in curricula?
5. Does the institution collaborate with the industry for sustainability work?
6. Does the institution promote Research on SD?
7. Would you say that the research in the institution focuses on any aspects of SD e.g. the economics of SD, social implications of SD and the environmental aspect of SD?
8. In the institution you are studying, are you aware of the existence of any practices or initiatives related to SD?
9. When you walk around campus do you see anything that tells you this is an institution committed to sustainability?
10. Do you think that the knowledge of SD is important for your future performance?
11. How much of a priority should be given by MHEI for SD in respect of curriculum and student learning outcomes?
12. How, in your opinion, could the implementation of SD in MHEIs be improved?
Appendix 3: REC approval

REC DECISION # REC-22-59(M)  Inbox ×

Email, PhD  (sent by cef@wmu.se)  Wed, Jul 6, 10:05 AM (3 days ago)
to me, Michael, Anne

Dear Yamkeia Nhleko,

I am pleased to let you know that the members of the WMU Research Ethics Committee (REC) have now approved the research related documents that you submitted to this office on 30 June 2022, concerning research study involving human participation.

You are now free to start your data collection work in consultation with your supervisors.

With kind regards,

Carla Fischer
REC Secretary
Faculty Support Officer
Research Projects and Doctoral Programs
World Maritime University
Appendix 4: List of participants

### Staff

<table>
<thead>
<tr>
<th>Respondents</th>
<th>Gender</th>
<th>Position</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>Female</td>
<td>Acting MD for Maritime Unit</td>
<td>19/08/2022</td>
</tr>
<tr>
<td>X2</td>
<td>Male</td>
<td>Lecturer</td>
<td>12/08/2022</td>
</tr>
<tr>
<td>X3</td>
<td>Female</td>
<td>Applications and Selections Manager</td>
<td>22/08/2022</td>
</tr>
<tr>
<td>X4</td>
<td>Male</td>
<td>Lecturer</td>
<td>30/08/2022</td>
</tr>
<tr>
<td>X5</td>
<td>Male</td>
<td>Maritime Research Coordinator</td>
<td>30/08/2022</td>
</tr>
</tbody>
</table>

### Students

<table>
<thead>
<tr>
<th>Respondents</th>
<th>Gender</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y1</td>
<td>Female</td>
<td>06/08/2022</td>
</tr>
<tr>
<td>Y2</td>
<td>Male</td>
<td>08/08/2022</td>
</tr>
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<td>Y3</td>
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<td>11/08/2022</td>
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<td>Y4</td>
<td>Female</td>
<td>13/08/2022</td>
</tr>
<tr>
<td>Y5</td>
<td>Male</td>
<td>22/08/200</td>
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</table>