



Department of Media and Social Sciences

Masters in Energy Environment and Society

Sustainable Development in The Study Curriculum and the impacts to Society. The

Case of University of Stavanger

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Acknowledgements

Looking back at my life in retrospect , I must say it's been a long journey getting to this point. As a young boy, I always cried when going to school at Humble Home Nursery ,Ghana through Emills preparatory and JSS , straight into Aggrey Memorial High School. Later to University of Ghana and proceeding to where I currently am (University of Stavanger) I must say I didn't enjoy going to school from the start, but I kept on going because I had special people who kept me on my feet to keep going. One of such people is my Mum Mrs Rose Koomson, who died on November 30, 2021 and couldn't live to see this day. I know she is proud and has poured herself a chilled bottle of Amstel Malt (her favourite) with smiles on her face, sipping and cheering me up in admiration. She made me understand the core values of hardwork in my upbringing.

Throughout my educational life, I always attended every school this person attended and followed his footsteps academically. He set an enviable mark for me to follow. I am always proud to be second to him in everything including his intellect. This person is no other person than my big brother Patrick Godfred Mensah Roberts. I want to say thank you to him for his support and constant encouragement , and reminder of how proud he is of me every time we speak on the phone

On the day the leaders of the MEEs study program introduced themselves and the course to us online due to corona , a man spoke and i said to myself i will work with this man when i finally arrive in Norway. Truly, I became his teaching assistant when I got to Norway. He is the supervisor of this thesis as well. I'm grateful to Thomas Michael Sattich . He opened his doors and was ready to assist in every possible way he can, academically. I thank him for his supervision, I look forward to working with him more in future.

Special mention to the rest of my family for support and solitude when the going got tough Also to my girlfriend and her family for all the assistance and making life relatively easier for me in Norway. I'm grateful to them.

Dedication

This thesis is ultimately dedicated to my mum Rose Koomson and big brother Patrick Godfred Mensah Roberts and all who contributed with their inputs to making it a reality.

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List of Abbreviations

1. DIKU ; Norwegian Agency for International Cooperation and Quality Enhancement
in Higher Education
2. ESD ; Education for Sustainability
3. HEI ; Higher Education Institutions
4. MLP; The Multi Level Perspective
5. OECD ; Organization for Economic Cooperation and Development
6. SD ; Sustainable Development
7. TTO ; Innovation Park Stavanger
8. UiS ; University of Stavanger
9. UNESCO United Nations Educational Scientific and Cultural Organization

Abstract

Also known as the “PetroCapital” of Norway, Stavanger is famous for having a buoyant and well established ecosystem in the oil and gas industry. The University of Stavanger is regarded as a key player in the innovation ecosystem and contributes immensely to supplying skilled human resources to the innovation ecosystem. In recent years, the calls for green transition has resulted in a change in the dynamics of the “traditional” oil and gas ecosystem. The University of Stavanger responds to these calls by integrating Sustainable Development into the study curriculum. Through Discourse Tracing, this study examines whether the decision to integrate Sustainable Development in the study curriculum came from Macro, Meso or Micro levels of society. The Multi Level Perspective combined with the Pragmatist Didactic approach provides theoretical underpinnings to this study.

Findings show that there is a strong level of influence on the University at all the levels (Macro,Meso,Micro) , establishing that all units in the innovation ecosystem work together to influence Sustainable development in the current study curriculum at the University of Stavanger.

1. Background

The teaching of Sustainable Development in higher educational institutions and the impact on the innovation ecosystem in an oil and gas region like Stavanger is vital towards achieving the 2030 agenda. By educating and training students to be competent in achieving the Sustainable development goals, society stands a great benefit from higher education institutions especially Stavanger.

By and by, significant environmental challenges like climate change, societal inequality and the loss of biodiversity continue to create global problems. These problems require competent and skilled individuals in society to tackle these problems. The core mandate of higher education institutions is to basically train and upgrade people and the needs of society. By providing knowledge, skills and value, higher institutions are essentially actively participating in a more sustainable future. It is therefore contingent on higher education institutions to foremost recognize their role in society and contribute their quota holistically to address these challenges faced by society.

Stavanger as a region has been through a series of economic transitions. From the fishing and canning industry to oil gas, one will argue the region's economic value has always evolved around the discovery of a valuable raw material. (Foss et al, 2015. Pp 223)

Despite being heavily reliant on oil and gas hence the name; "PetroCapital of Norway", the region in recent years have realised the need for a diversified and sustainable economy. In response to this, the region requires solutions that are not just innovative, but environmentally friendly and viable economically.

Innovation ecosystems describe the collaborative effort of a diverse set of actors towards innovation. Producers, suppliers, distributors, financial and research institutions, makers of complementary technologies, and regulatory bodies are just some of the organisations that constitute the innovation ecosystem (Mäkinen and Dedehayir, 2013)

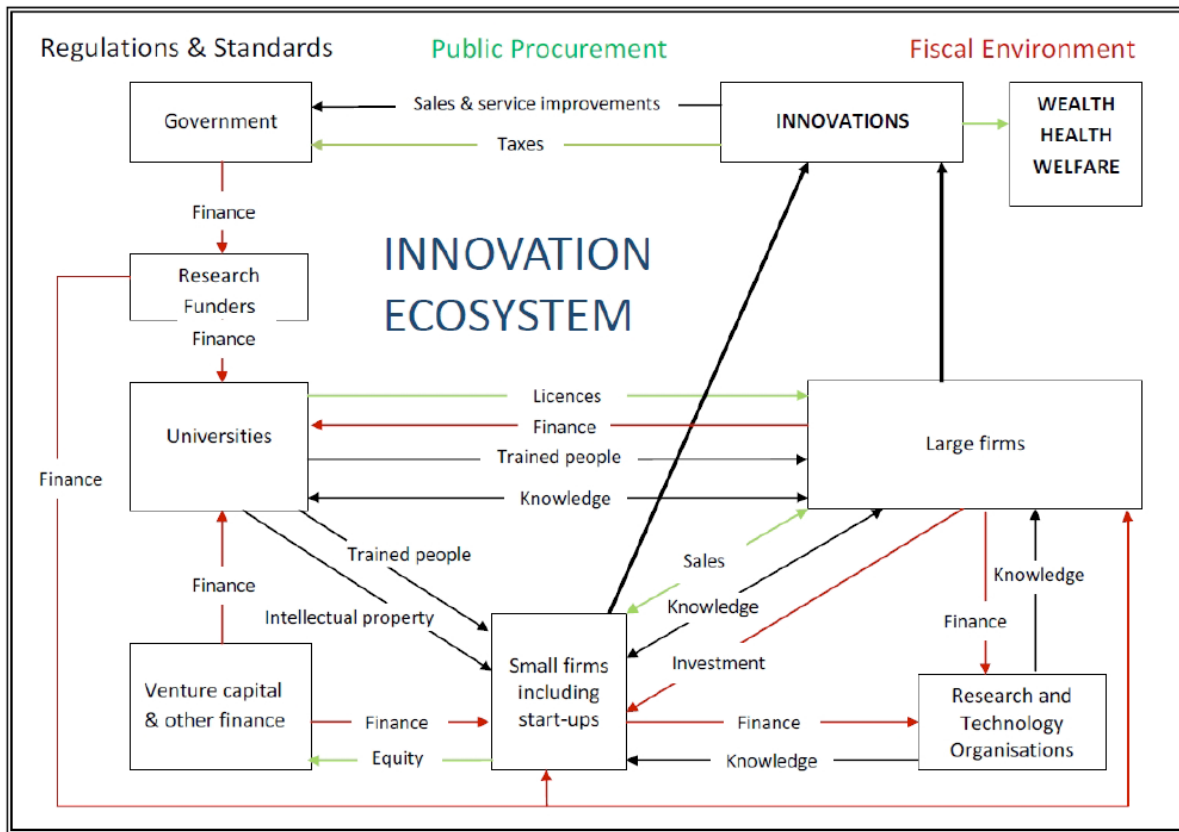
Currently the innovation ecosystem in Stavanger is strongly dominated by the presence of oil and gas and its affiliated industries. It consists of various actors including research

institutions, start ups, higher education institutions, established companies and financial institutions. See figure 1 on the next page.

The introduction of Sustainable development in HE institutions may have an impact on the innovation ecosystem in Stavanger. Having to think critically and influencing alternative and creative perspectives on sustainability issues may garther a new dawn of students who contribute significantly to sustainable societies. Ultimately, HE institutions may foster the transition of the ecosystem from an oil and gas dominated one to Sustainability focused businesses.

This thesis aims to explore the role of higher education institutions (University of Stavanger) in teaching sustainable development and the impacts this has on the innovation ecosystem and society as a whole in the Stavanger region. Eventually, the findings of this research will provide insights into how higher education can better support and promote sustainable development and innovation in other higher education institutions that find themselves in a similar situation as the University of Stavanger.

Figure 1 – The innovation ecosystem



Source: [Improving the Framework Conditions for R&D](#), Luke Georgiou, June 2015.

As shown in figure 1, the innovation ecosystem consists of many interconnected actors or institutions that work together in a holistic manner.

1.1 Introduction

Historically, Stavanger has been a region that responds to the world market and transitions to the needed resource when necessary. Once upon a time, Stavanger was a region known for fishing and canning. Eventually, the fishing industry dwindled and Oil and Gas was discovered.

The discovery of oil and gas caused a total overhaul in the economy of Stavanger. Growth in the oil and gas industry demanded the birth and establishment of other industries to complement the development of the industry in Stavanger. This led to the establishment of a vibrant innovation ecosystem. Stavanger has been the oil capital of Norway over the years, with an established ecosystem and long tradition built around the oil and gas industry. This ecosystem spans from industry, labour, education, etc. Over the years, all aspects of Stavanger's economy have benefited immensely from oil and gas. From state welfare to a booming and buoyant economy, one cannot overlook the contribution of oil and gas to Stavanger.

The University of Stavanger was one of the institutions which was born out of long efforts of the oil and gas industry in Stavanger.(Foss et,al.2015, p 224) The University was established to generally produce skilled labour regarding health and teacher training among others, but more importantly, its main mandate was to supply the skill set of labour the oil and gas industry needed. Till date, the University of Stavanger continues to fulfil its core mandate as espoused in its establishment. Prime examples are study programs and courses that are practically geared towards oil and gas like Petroleum Engineering - and this is exactly what is expected of the innovation ecosystem developed in a region.

Down the history lane, calls from the United Nations and other international agencies to go green and save the planet have been on the rise in recent years. Norway continues to respond to these "green" calls and as such has implemented strategies and policies in line with these developments by the United Nations. Examples are the Paris Agreement in 2015, which stipulates that the world makes efforts to keep global temperatures to below 2 degrees celsius and 1.5 degrees by 2100.(Huang et al.2021). In effect, Norway set ambitious targets of becoming a low emission society by 2050. Other targets set by Norway include reducing

average greenhouse emission per person from 10 tonnes to 1- 2 tonnes per annum.(Climate and Environmental Plan Stavanger,2018.p 3)

Stavanger as a region set objectives in line with the national and international objectives to cut all emissions to 80 % by 2030 and be a fossil free municipality by 2040. (Ibid, p 5) which means, the region will make conscious efforts to achieve these targets in industry, economy, environment and others.

Clearly, the adoption of these environmental and climate change mitigation goals has enabled the concept of sustainability to seep its way into the innovation ecosystem. It is gradually being felt by all. From the Finance sector in the innovation ecosystem to the research and development sector, there is no denying the fact, the presence of sustainable development. In education , the United Nations states categorically that Education for sustainability is a necessary concept in helping to shape the awareness,attitudes and behaviours of students towards a more sustainable future. (Sarabhai, 2015; UNESCO, 2021)

Additionally,integrating key sustainability concepts into the study curriculum would assist in transferring sustainability related values to students who would then act upon them to change their behaviour in society .(Fiselier et al., 2018, p. 396) Educational institutions in Norway have embraced Education for Sustainability by curating and introducing Sustainability focused learning materials in the study curricula.

Recently, the University of Stavanger introduced sustainability into various study programs in social sciences. One of such many examples is the MEE's study program which is fully dedicated to the training and teaching of students to contribute its quota to help fight climate change in various respective ways.

Consequently the study program translates directly or indirectly into helping shape and provide experts to provide solutions the world is facing currently with climate change.

This brings us to an inquisition that, why will an oil and gas region like Stavanger , have its main higher educational institution shift its teaching ideals towards Sustainability? This inquisition will further be expanded in the research question but before then, the reasons for undertaking this study will be outlined below.

Undertaking this study within the context of Stavanger as an oil and gas region is imperative for the following reasons;

Firstly, borrowing from the innovation diffusion model, it posits that policy diffusion occurs when policy adopted by one social system or governmental jurisdiction is influenced by the choices of other governments (Stokes and Berry, 2017). In essence there are many oil and gas dependent regions all over the world that are faced with a similar paradox of the energy transitions and arguably locked in on high carbon pathways. Norway sets an enviable record by being amongst the world's leading oil and gas producers and at the same time spearheading sustainable transitions concurrently. Hence, for countries that look up to a model to emulate, Norway's management of the energy transitions becomes a blueprint. Secondly, evidently, research institutions in the innovation ecosystem have been on the receiving end of funding from the big oil industry in Stavanger. This is particularly evident in (entrepreneurial university where the author highlighted 'the masters degree in business administration' of Uis was particularly established through funding from the finance community as part of efforts to handle the cash flow from the oil industry). This becomes somewhat of a paradox, because clearly, one can tell the ecosystem was engineered by the powers that be in the region, to get its current level, on the other hand sustainability is steadily changing the everyday dynamics of the ecosystem. This study will try to ascertain whether the new research directives and focus has been sanctioned by the oil and gas industry or by whom?

Thirdly, based on personal scoping interviews I had with some individuals (vibrant contributors to the ecosystem), the general impression I had from feedback was that some in the oil and gas industry see sustainable development as a concept which is more of mere rhetoric than actually making a significant impact in reality. Contrasting views in my scoping interview was also that sustainable development in the University of Stavanger is making a real impact on society through many avenues. This then poses a fundamental problem because graduates that are trained from the University to become sustainability managers will like to help use skills and knowledge gained to solve real world problems. If some section of industry players do not see how beneficial Sustainability skills are to the ecosystem then it becomes a problem for society.

Lastly, for some people, sustainable education was implemented and assimilated into the study curriculum through policy from a global to national then a regional and societal direction. Others are of the view that sustainable education started from the core grassroots; some individuals took up the mantle to educate and inform future generations about using

resources sustainably and helping mitigate climate problems. This study helps to identify the pathways either bottom up or top down for a future policy implementation.

1.1.1 Research Questions

Achieving set targets by the Paris Agreement and implementing the Sustainable Development Goals require mutual support from the oil and gas industry and Higher Education Institutions. Therefore exploring the relationship between Sustainable Development Education the innovation ecosystem and industry in Stavanger provides a deeper understanding of the current state of higher education institutions and how they can support sustainable innovation and promote sustainable development in resource dependent regions. The study therefore asks these research questions

Considering Stavanger with a well established ecosystem in the oil and gas industry adopting sustainability in recent years. It raises a lot of questions to be inquired on. I hypothesise that the ecosystem is a continuous loop, and that all individual units in the ecosystem contribute to the changes towards sustainability in the University of Stavanger.

1. Is the shift to Sustainable development in the study curriculum driven by policy?
2. Is the University proactively involving sustainable development in academic curriculum to shape the future society? What are roles and limits in such endeavor?
3. Is the economy or environment around the university contributing to changes in the university towards sustainable development?

The first question seeks to understand the level at which the University of Stavanger is committed towards Sustainable Development. Hypothetically, If the infusion of sustainable development in the study curriculum is policy driven, then the commitment of the University may be perceived as compliant driven one as opposed to genuinely contributing towards sustainable development. However, if the shift in the study curriculum is driven by the need to promote sustainable development, then it may indicate a more proactive approach towards the matter.

The second question tries to understand the approach of the university in relation to sustainable development. In other words, whether the university tries to incorporate sustainable development proactively in the study curriculum. This also helps in ascertaining

whether the University targets just specific aspects of Sustainable development or the University promotes Sustainable development holistically.

Third question sets a critical tone to this research. It explores impacts to society. In the grand scheme of things, current students that are learning about sustainable development are believed to approach modern day societal problems sustainably. Especially in an oil and gas dependent region like Stavanger. This question is important in understanding the perceptions and attitude of students and how the study curriculum has prepared them to become responsible stakeholders in society. Additionally, insights may be drawn on how effective sustainable development education is in preparing current students to take up future roles in society. For instance, the University of Stavanger is a great beneficiary of funding and other financial establishments from the oil and gas industry. Also the oil and gas industry is a significant contributor to the economy of the region, therefore encouraging new sets of sustainable practices by the university may present challenges. Understanding the challenges and capitalising on the opportunities will put the University in a uniquely strategic position to assist and facilitate transitions in an oil dependent region like Stavanger. Moreover, the experiences and findings from the case of University of Stavanger will provide exemplary valuable insight for other regions around the world faced with similar challenges.

1.1.2 How the Thesis is Structured?

This thesis is structured in different categories. The first chapter starts with the introduction then proceeds with the problem statement and research questions. The literature review is briefly outlined in chapter two. The third chapter discusses the theoretical underpinnings of the study. The fourth chapter presents the methodology of the study including the research design , collection of data and analysis . Findings and discussions are all presented in the next chapters. The final chapters include the conclusions , recommendations and references.

2. Literature Review

Literature reviews provide access to the academic conversations surrounding the topic. Logically argued cases are laid out and founded on the comprehensive understanding of the current state of knowledge about the topic. (Machi, et al. 2016) Lambert 2012, defines it as a critical analysis of what is known about the study topic, themes related to it and various perspectives expressed regarding the topic. To catch a glimpse of what has been done about the current topic and various viewpoints argued in existing literature, we reviewed a couple of literature in the ongoing body of work related to the subject matter.

With a lot of literature and considering how widely disputed the concept of SD is in academia. I resorted to adding other keywords in my search for a more narrowed and apt review. Terms like education, higher education and sustainability, innovation ecosystems were included in the search base.

2.1 Sustainable development and Education.

The concept of Sustainable Development has gone through several revisions and debates in academia. After it emerged in 1992 at the UN Summit in Rio De Janeiro as an international policy, several academic perspectives were drawn to it. O' Riordan, 1988 recalls, at the time of several definitions to Sustainable development, and he says "the diversity of the conflicts between these definitions is becoming like a motherhood and apple pie, a concept which everyone supports but no one defines consistently. However, most definitions of Sustainable Development require that the quality of life should not decline over a long term.

Later, the Brundtland report, which gave impetus to the concept defines SD as Development that satisfies the needs of the present without compromising the needs of the future.(Chichilinski,1997)

Additionally, it is argued that even though even though there is not a widely accepted agreement on the definition of sustainable development, it is an unarguably persistent concept in our everyday lives and a useful tool in our social political economic and

environmental lives (Meadowcraft 2007) Keiner 2005 argues that regardless of widespread disagreement on the definition of sustainable development, the widely accepted is defined as one that meets the needs of present generation without compromising the ability of future generations to meet their needs (WECD,1987)

2.2 Sustainable Development in Higher Education Institutions around the world

Education for sustainable development has been existent as an important factor to achieve great environmental strides. Historical progress such as that of the Stockholm conference in 1972, the intergovernmental education conference in belgrade 1975 , Tbilisi - UNESCO UNEP 1978, Moscow 1987 are all honourable mentions which led to the conclusions that education has contributed immensely to sustainable development. (UNESCO UNEP, 1988) Subsequently, there has been enormous literature on the roles sustainable development plays in education, especially higher education. Scholarly literature has highlighted the importance of higher education in promoting sustainable development as well as provided constructive criticisms on how these roles play out in reality , additionally providing recommendations on forward looking measures. Some of these arguments are highlighted below

Filho et al , recognizes valuable inputs HE makes towards implementing SD. However, Filho et al expressed how it was unclear how this takes place all over the world. The study was undertaken from a global perspective , a survey was conducted on 65 countries from 209 experts. In addition, participant countries were carefully selected ranging from developed, developing and in transition countries. (Filho,2015)

Indeed, the SDG's creates the opportunity for increased collaboration between and amongst Universities. However, there seemed to be a lack of social engagement and partnership. In addition, students are not proactive in requesting for more opportunities and research on the relates sustainable development goals.

Study recommends the need for revising the teaching curricula and research projects to include the SDGS.

Cortese 2003 argues , on the role of higher education in sustainable development, the mindset to transform and sustain education on a long term basis is present.Higher education

institutions are known to bear a profound moral responsibility to increase knowledge skills and awareness to forge a just and sustainable future.

However, education for a just and sustained environment or world is not of high priority despite efforts of groups and individuals within the formal education system.(Cortses,2003; McIntosh et al,2001).

To buttress education not being a high priority for higher education institution, Glyphis 2001 argues that, the people graduating out of the worlds best universities are rather leading the world towards an unsustainable unhealthy path. A few architectural and engineering schools have made sustainable designs a standard practise in their foundation of practise and education. Similarly, every other discipline and profession share common traits in the same regard. (Glyphis, 2001) . Interestingly, higher education institutions are seen to be generally organised into traditional disciplines and highly specialised areas of knowledge.

Additionally, higher education institutions focuses on individual learning and competition resulting in ill prepared professionals that are not ready for cooperation. (Cortese,2003)

The distinction between the traditional focus of higher education institutions and a fully integrated Sustainability higher education institution is highlighted below

In Qatar, it is believed education could reverse engineering recurring environmental social and economic challenges. As an oil and gas dependent country, also known as a rentier state, there were ambitions to achieve SD through a national vision.

Zguir et al argue that a strong partnership with UNESCO to adopt the SDG's across the study curriculum will enable students to be innovative and evolve in their thinking skills and be mindful towards their surroundings .

However, there is the lack of strategic and holistic approach in integrating ESD in the study curriculum .Additionally, in general, education for sustainability is widely underreported and progress is less monitored and traced.The study used a systematic quantitative literature review approach in general the study was conducted from a global perspective to investigate curriculum models using USA, Singapore, New Zealand ,UK ,CHINA as a case study.

After the notion of globalisation was used to examine different curricula models from the countries mentioned above, an account of qatars contemporary education system were reviewed against recent reforms. Zguir et al suggests, embedding ESD and SDG values into secondary school and higher education curriculums. The study also suggests states to leverage on the potential international collaboration for case study countries like singapore and new zealand which share great educational similarities with qatar

Valena Ruiz and Vargaz et al sought to understand the interaction between Universities and local communities.

The study established that indeed HEIs have the potential to locally establish itself to act as pillars to local sustainability initiatives

In this study, reports from 22 Universities were analysed based on their reporting of sustainability initiatives. The Universities were from both developed and developing countries.

Ruiz et al demonstrates that universities are developing projects with local approaches and acting as partners for local sustainability however little discussions were raised in terms of a global overview . therefore a general and international report on sustainable development initiatives on local acting by Universities is needed.

Indeed the research also suggested that there is no significant difference in the challenges Universities face between developed and developing countries as far as pursuing sustainability is concerned.

Another cross geographic study was conducted by Raath and Filho et al,2018 across seven countries namely brazil serbia south africa spain syria uk. The researchers aimed at displaying how commitment and faculty engagement of students could transform learning and education for sustainability. Findings from this study indicate that the concept of education for sustainability has not been integrated into higher education institutions sufficiently. Additionally, Raath et al adds that to enhance sustainability in the study curricula, collaborative approaches should be drawn and developed by academics in designing a multicultural vision of sustainability both as a field of education and as a topic on its own. The study goes ahead to recommend that it is necessary that higher education institutions serve as models of social and environmental justice and foster learning sustainably. Additionally, Raath and Filho et al agree that academics should reflect on their own values and know that they are crucial instruments for assisting students to develop and be transformative agents of a sustainable future.

2.3 Sustainable Development and Innovation

As mentioned previously, sustainable development has gained considerable attention from policy makers and industry stakeholders. Innovation is part of the key areas argued to play a role in enhancing sustainability. (Silvestre and Silva Neto,2014) Constantly , innovations are known to be changing our way of life and external environment and they considered key elements through which institutions , countries and society at large could implement sustainability(Silvestre,2015)

The innovation for sustainability is argued to be complex, dynamic and uncertain as other types of innovation in terms of its development and implementation. (Seyfang and Smith 2007; Silvestre, 2018) Literature on sustainability and innovation have agreed that enhanced sustainability cannot be achieved without innovation (Silvestre,2015; 2018) this is due to that fact that to achieve enhanced sustainability , adaptation and change in policy orientation, product management approaches are required. Schumpeter 1934, Silvestre 2018 argued that whether innovation is incremental or radical , or whether innovation is new to an industry organisation will depend on path dependency. Where Path dependency refers to the contextual and historical factors that influenced decision makers in one direction or the other (Martin and Sunley,2006) Silvestre 2018 argues innovations that need to be made are always guided by previous decisions made. The same can be said for innovation and sustainability, when innovation is being developed for sustainable development, path dependence becomes often necessary due to high switching costs or existing powerful network effects. (Silvestre,2018)

2.4 Sustainable development and Norway

The successful implementation of the SDGs is contingent on the national, regional and local context of authorities and their ability to translate the goals to their contextual understanding.(Lundberg et al 2020) Even though the SDGs have been adopted at the international level , the implementation of these goals are mostly bottom up.(Bardal,2021) this is backed by an estimation that close to 65 percent of the sustainable development targets could not be realised without the help and involvement of local actors.(Kanuri et al 2018) Norway was ranked 6th on the list of countries pursuing the SDG's to the core according to the list of countries on progress towards achieving the SDGs.(Sachs 2020) Norway has

always been the advocate for the agenda 2030 even to the point where the then prime minister was leader of the UN appointed SDG advocate group. For national and local expectations, the Norwegian government in 2019 stated the main political framework to address the world climate crisis and other challenges must be the SDGs. Further to this, the local and regional authorities were acknowledged as responsible for achieving the 2030 agenda since they were the closest to organisations, people and businesses. Social and physical infrastructure were all highlighted as essential responsibility of local and regional regional hence the government expects the SDGS to become a foundational part of the regional and local planning (Local Government Norway,2019) Norway is credited for making considerable efforts towards achieving the agenda 2030, however, it has been criticised heavily by the Norwegian Auditor general's report that the Norwegian government has not properly coordinated the national implementation of the SDGS sufficiently. Additional criticisms are the lack of comprehensive national implementation plan, which the Norwegian auditor general describes as being behind other nordic countries. (Bardal,2021)

2.5 Summary

The aim of the brief literature review was to identify what has been done in the current body of work in literature concerning the research area. We started off with reviewing what academic literature has said about Sustainable development, Innovation and Sustainability, Higher education and sustainability and delved into the Norwegian context and what it says about sustainable development. Existing literature acknowledges the contributions of sustainable development, it's definition as a bone of contention by academia and other interested perspectives. The review then also sheds light on the link between Sustainable Development and Innovation and explains the need for innovation to assist society to realise the 2030 agenda. The review then also sheds light on Norway, and it's adoption of Sustainability in the higher education institutions around the world. Throughout the literature review, a common theme that ran through was that literature recognizes the need for Sustainable development to be at the forefront of government policy and decision making. Additionally, an interesting theme that runs through the literature as far as higher education and sustainability is concerned is the lack of embeddedness and insufficient amounts of

infusion into the academic and University institutions. Another theme is the lack of commitment from stakeholders and monitoring of sustainability practices in institutions and the Norwegian government.

My thesis then picks inspiration from the aforementioned literature, however it takes a different route. This thesis identifies a predominantly oil and gas region with a fully built innovation ecosystem around it. Then looks at Sustainability, a relatively recent concept in one of the elements of the ecosystem i.e the University of Stavanger and how Sustainability in the study curriculum is impacting change. This study becomes relevant as this topic is novel and has not been explored extensively in academia. Also , even though the relationship between sustainability and higher education , sustainability and innovation have been all explored in literature, the nexus between these concepts in an oil and gas region have been less explored and this research sheds light on this tangent academically.

Lastly this study overall contributes to the academic body of work ongoing in the grand scheme of things to help fight the environmental crisis facing humanity.

3. Theory

In the absence of a good theory, you should make them up yourself.

A student who has difficulty thinking of at least three sensible explanations for any correlation that he is really interested in should probably choose another profession (Stinchcombe 1968; 13)

Stinchcombe argued that a very salient issue for a researcher is where to get a suitable theory. Blaikie et al posits, one of the most vexing problems for researchers is how to use theory in research. Arguing that a good research is supposed to involve the use of theory one way or the other (Blaikie 2019)

Merton expressed his view on theory by saying ; the problem is what kind of theory to use and for what purpose. Given the existence of diverse perspectives in social theory and differences in ways theory is used. (Merton 1967;39)

Generally, theory has been described as a heuristic device for organising what we know, or think we know at a particular time or less explicitly posed questions or issue (Ineles 1964;28) Specifically, Gilbert 2008, defines theory as one that highlights and explains something that one would otherwise not see, or would find puzzling. (Gilbert 2008; 25)

Blaikie and Norman also view theories as explanations of recurrent patterns or regularities in social life. In other words, they are answers to puzzles or questions to why a phenomenon happens in the way they do in a particular context. (Blaikie 2019)

In this section, two interesting theories from psychology will be borrowed to help understand and put research findings to perspective. Even though not directly related to the topic of study here, the theory helps to put the line of thoughts in the research questions to perspective. Knowledge is borrowed from this theory of psychology as a guiding tool to relevantly demystify the overarching research question.

3.1 Combining Pragmatism and Didactics theories meets the MLP

To discuss whether the University of Stavanger is being reactive to exogenous events or being proactive to the course of sustainable development, we use the Multi level perspective as a framework to contextualise the underpinnings of the research question.

3.1.1 Basic Assumptions of the MLP

The MLP is middle range theory that conceptualises the dynamics and patterns of socio technical transitions.(Geels, 2011) Concepts from evolutionary economics science and technology structuration theory and neo institutional theories are all combined analytically as a framework.(ibid.)

In applying the MLP , the most important prerequisite is the existence of three analytical levels, namely ; the regime , landscape and the niche. (Holsgens et, al. 2018)

3.1.2 The Regime

Geels and Schot (2010) describe the technological regime to be characterised by communities of engineers, social groups such as policy makers ,users, scientists, and special interest groups which interact together to form networks with mutual dependencies. It is very important to note that the regime is not always centralised by technology and engineering practices but other constructs .

In addition, the regime is seen as predominantly stable and are highlighted with “lock-in” mechanisms ensuring the functioning of the socio technical systems (Holsgens et al 2018)

In the context of this research , the regime can be associated with the current functioning of the University of Stavanger. The regime level, is located among other things, by the prevailing educational policy orientation and the expectations of most students regarding their education

(Radinger-Peer eat, al 2021). Again putting this to the context of the University of Stavanger, the current educational policy is seen to be more aligned with supplying the workforce to the oil and gas industry. Note briefly, that the University of Stavanger also supplies workforce to other industries such as health, Business Administration etc. this is what is regarded as the status quo .

Since the inception of the University of Stavanger, the University has operated based on policy, available technology, industry ,culture and Market preference of the region. So for a region like Stavanger, policy was set in stone to support oil exploration and

commercialization, the oil and gas industry was firmly developed as a result, market demand was on the rise and an educational institute was set up to explore scientific epistemologies. All these combine and interact with each other to consolidate and solidify the status quo.

3.1.3 Niches

Niches are seen as protected spaces such as R & D laboratories, subsidised demonstration projects or small market niches where there are new demands and users are willing to support new innovations. (Geels,2011) Niches are characterised by individual actors who work on radical innovations and hope that their promising innovations are eventually used or replaces the regime.(ibid)

Kemp et al, 1998 , Schot and Geels, 2008) identifies distinguishing processes in the niche development as building of social networks to expand the resource base of niche innovations, articulation and adjustment of visions to provide guidance to innovations with the aim to attract external funding and learning and articulation processes on various dimensions such as market demand, policy instruments etc. from the perspective of the MLP , sustainable practises are undertaken in the niche space. In the context of this research,cooperative initiatives between the university and local actors could be regarded in the niche. Other initiatives have been taken by local stakeholders to develop a vibrant R &D environment. This is particularly highlighted by Oftedal et al, pp 228 as ; innovation and entrepreneurship in the region traditionally came from tactical solution oriented individuals and was not typically the product of systematic coordinated academic research. This buttresses the perspective of niche developments in the region from a historical point of view. Other niche developments could be transdisciplinary research or networks of actors in different places.

At this level , opportunities for change arise both at the level of individual pioneers among researchers and at the entire departments that have adapted and understand their contributions to sustainable development.

3.1.4 Socio technical landscape

The landscape is often seen as the wider context which influences the niche and regime dynamics (Rip and Kemp,1998) . It is characterised by demographic trends, political

ideologies, societal values and other set of factors that can be combined within a landscape category.(Geels,2011) . Actors in the regime and niche levels often have a difficult time influencing the landscape in the short run due to the external context they form . In terms of University of Stavanger, discourses related to sustainability issues, major societal challenges like climate change and the implementation of mitigation strategies like the sustainable development goals are all issues of concern in the landscape.

3.2 Complementary Perspectives with the MLP

In this section, the teaching theories of Pragmatism and Didactics will be explained, identifying the points of convergence and juxtaposing it with the MLP .

3.2.1 Assumptions of Didactics

Didactics grew out of the need for teacher educators to give their teaching methodology a systematic basis beyond single lessons on theory and empirical scrutiny. (Wickman, 2012, pp 484)

Didactics may be defined as teaching what content should be taught and how it should be taught. The theory posits that the main preoccupation of a teacher is deciding a specific content to teach and how it could be taught.(ibid,pp485) in other words, they concern the teachers selection of content and methods to teach in relation to specific students at a specific place and time . This theory emphasises the active role of the teacher imparting knowledge which is necessary to the students. For instance,at the University of Stavanger, Facilitators (Lecturers) plan and structure lectures they deem fit and suitable through instructional teaching.

3.2.2 Pragmatist Approach to Education

The pragmatist believes education prepares an individual for life and makes them socially efficient. (Rai et al, 2020) . This theory fundamentally concerns knowing in action and making sense of the consequences of actions in ways that help us proceed with our undertakings with purpose. (Wickman, 2012. Pp 486) thus in gaining knowledge,one must learn to successfully transform patterns of action in relation to situated consequences. The

basic assumption of this theory is that reasoning on inquiry is part of lived practice. In other words, practices are part of communities and institutions where actions are carried out in habitual ways so they tend to produce certain consequences. (Dewey 1992, Wickman 2012, pp 486) In addition, the theory goes on to explain that inquiry stems from the need to improve the consequences of some practices. By this logic, problematic consequences result in inquiries or questions about alternative ways of acting. Considering how habits and custom practices are complex and indispensable, this theory suggests for teachers to institute piecemeal changes as starting points instead of wholesale change. (Dewey 1992; Wickman, 2012, pp.486)

It should be noted that this theory places emphasis on the student and how creative and confident they are, in finding solutions to problems whereas the teacher is regarded as a guide in helping to find solutions.

3.2.3 Merging the MLP & Pragmatic Didacticism for Sustainable Development in the study Curriculum

As espoused earlier, the theory of the MLP outlines the three dynamics in socio technical transitions. Being a) the landscape where sustainability discourses happen as well as global exogenous events,
b) the regime which represents the status quo where activities of a functioning system operates and
c) the niche where individual innovators are based hoping to break through the status quo. Now, in linking the MLP theory to the theories of didacticism, notice that it was mentioned earlier that the didactics are more teacher centred and operate on firstly the teacher deciding on what is to teach and how to teach? and what content? making the approach a teacher centred one. Discourses such as Sustainability, environmental crises which belong in the landscape influence and spark up interests in the regime either through policy or existential global threat, teachers then are often influenced by these events to revise the study curricular and include sustainable development when designing and developing study programs. On the other hand, coming from the niches is where learning activities takes place essentially, from the pragmatists approach, after teachers have didactically designed and revised the study curricular with topics of sustainability, students are then incited by a the same existential global threat which their habitual ways of acting and coordinating with the surrounding world are disturbed, which then gives rise to inquiry. Through inquiry, students are then

encouraged to devise strategies to alternate ways of acting, which then ultimately leads to the formation of a new regime in transitions as explained already in the MLP. per this logic, the University of Stavanger through the lens of this theory belongs in the regime where teachers are also part of the status quo, teachers developed and designed the study curricular centered around sustainability which is seen to suit contemporary needs and competency of students, eventually, students thinking are pragmatically stimulated to come out with alternatives to pertinent issues such as climate change. Ultimately, students are then able attain new knowledge skills and values to help Sustainable transitions in the grand scheme of things.

4. Research Methodology

4.1 Introduction

In this section of the study , the methodology used to conduct the research will be presented as well as rationale behind every research design in this section will be justified. Also highlighted in this section is the processes for data collection, analysis of data , ethical guidelines, considerations and limitations and difficulties encountered during the course of this study.

4.1.1 Research Design

A research design is an integrated statement of and justification for the technical decisions involved in planning a research work. This process in simple terms is analogous to an architect designing a building: which involves recording, relating and then evaluating decisions that need to be made. Careful attention to detail and concern with the overall workability of the design are required. (Blaikie, 2019) The research design functions as an enabler to address research problems effectively and unambiguously as possible.(SacredHeart University,2020). In this research study,data will be collected from respondents in this study to shed light on this issue at hand. Through semi structured interviews, data will be collected and carefully analysed to arrive at an empirical conclusion. In analysing the findings of this research, discourse tracing ;which draws inspiration from contributions and criticism from ethnographers, discourse critics and case study scholars, will be applied to draw insights about how we engage in critical interpretive and applied analysis of discourse. This approach is particularly helpful in studying social processes including the facilitation of change and the institution of new routines. (LeGreco and Tracy, 2009)

4.2 Sample and Data Collection

4.2.1 Selection Criterion

To answer the research questions, participants with in-depth knowledge and expertise about the research topic were considered. Due to limited resources , I adopted the most suitable and convenient technique to draw participants to the research study. The most suitable technique

therefore used was the purposive sampling technique. This technique is widely used in qualitative research for identifying and selecting information rich cases for the most effective use of resources (Patton, 2002) it also involves the selection and identification of individuals or groups of people that are knowledgeable or experienced about a phenomena of interest. (Cresswell & Plano Clark, 2011) Another consideration I made in my selection was the willingness and availability of the study participants to effectively communicate, participate and express their opinions on the subject matter without fear or favour. For these reasons, my first point of contact and participants were lecturers and professors from the University of Stavanger that teach subjects related to Sustainable Development and Energy. The lecturers belong to both the social sciences and engineering department at the University, teaching master programs related to Sustainable development, environment, energy transitions and society. Selecting the professors were as a result of their expertise, experience and overall understanding of the dynamics of what they teach, and what goes into the selection and decisions on what to teach in the study curriculum. Hence they are able to provide insights and discuss into detail the subject matter at hand. Secondly, using the same purposeful sampling, another group of participants interviewed are the student alumni and second year master students who studied sustainability related programs who are preparing to transition into the job market or have already entered the job market respectively. Reason for their inclusion in this research is because they carry what is being taught to society, thus they are the direct link between academia and society, whatever they do on the job market or society becomes a direct or indirect reflection of what they studied at school. Additionally, they are one of the most convenient and easily accessible groups to consider as participants in the study. Hence their inclusion.

Additionally, also through purposive sampling, I chose to recruit an expert from the Municipality in charge of higher education institutions to speak to relevant questions raised in the research. Due to the scope of the research, inputs from this level will be a helpful venture.

Lastly, another relevant group of participants considered were recruiting representatives of companies which sources its skilled labour from the University of Stavanger. These groups of participants are particularly important because based on their industry directives and policies, they partly determine or influence labour demand on the job market. It will be particularly interesting to ascertain whether the dynamics of the job market (industry) could directly or indirectly inform decisions made in designing the study curricular.

4.2.2 Collection of Data

For my data collection in this research, I decided to use the semi structured interview format in gathering my data. A semi structured open ended interview is a data collection method that involves asking participants a set of open ended questions and following up with probe questions to explore further their response on the topic of interest (Dejonckheere, 2019) .

This is because the research focuses on exploring the thoughts , actively and freely allowing participants to express themselves and also make some recommendations when necessary.

Ordinarily, I began my interview with a dialogue and a flexible set of questions as a guide while having the autonomy to steer the direction of the interview. This allowed for follow up questions and addition of vital comments when necessary. A closed ended strictly structured interview would have prohibited the acquisition of detailed responses from which a theme and pattern of participant opinions could be derived from. Voice recordings through an audio device were used to generate the data and it took a couple of weeks to finalise the data collection phase .

After my questionnaire was carefully drafted, I proceeded to register my research and secure approval from the Norwegian Center for Research Data (NSD) . This body is one of Norway's largest archives for research data which provides data to students and researchers in Norway and abroad . This institute also assists researchers concerning data gathering,data analysis, issues of methodology ,research ethics and privacy.(WNU

Library,2023) the process of registering your research project involves creating an account first, and then filing a request form. Additional requirements include the full inputs such as your full research or thesis topic, research objectives, estimated timeline type of data , thus indirect or direct personal data which is identifiable, data confidentiality , debriefing and participants' rights to decline or voluntarily participate. All these are briefly explained and conveyed to the researcher subject to approval by the NSD.

After all formal research and data collection prerequisites were satisfied, my first group of participants were contacted. I then wrote a formal invitation with a debrief concerning the research topic and estimated time of completion of interview. Interested participants received a consent form to sign and various interviews were scheduled accordingly. I must mention that group pages on social media were one of the mediums through which the student participants were contacted. Categories of participants other than students, were contacted either by word of mouth at the various offices, and in circumstances where they were not available at their offices,emails were used to contact them . I must also mention that, post

(COVID19) pandemic technology gave participants the option to choose to have an in person interview or an online interview through microsoft teams. Themes and concepts and ideas were derived from these interviews which enabled transcriptions for the findings of this research and subsequent discussions.

Confidentiality and anonymity of participants were highly assured , and to ensure this , code names were used to conceal any form of real life identification in this research. To complement my primary source of data collection for this research, secondary data in the form of in depth review of literature, articles, research materials and journals were all read thoroughly to broaden my horizon on the subject matter. My main literature sources were gathered from google scholar, scopus, UiS Oria and other authentic academic research domains i considered fit for my work.

4.2.3 Sample Size

Sample size decisions are always a compromise between the ideal and the practical, between the size needed to meet technical requirements and the size that can be achieved with the available resources.(Blaikie,2019) For this research the participants interviewed were 10 , which constitutes students and experts ranging from academia to industry. Scholars have argued that there is no rule of thumb to set out defined answers to the how many in a sample size. (Vasileiou et al.2018) Sandelowski 1996, also suggests qualitative samples should be large enough to allow the unfolding of quality understanding of a phenomenon under study and at the same time small enough so that deep case oriented analysis of qualitative data is not precluded.Lincoln and Guba also suggested one principle to determine sample size is to be guided by the criterion of information redundancy. Thus in the case when a researcher realises additional information from more sampling does not elicit new information, sampling can be terminated. Due to the type and power of information provided by participants (answers provided comparatively extensive) I decided to use a smaller sample size. This decision is particularly buttressed by Malterud et al. by saying , information power as a pragmatic guiding principle , suggests that the more information power provided by the sample, the smaller the sample size and vice versa

4.2.4 Analysis of Data.

For my analysis of data, Discourse tracing was used . According to Putnam, Philips, & Chams,1996 Taylor Van every,2000) discourse tracing is a mix of process tracing and discourse analysis. In other words, in the roots of discourse tracing is discourse analysis. It is a form of multilevel discursive analysis which involves defining a case based on a turning point, reviewing relevant literature.gathering data across three levels of analysis.(Malvini Redden 2017) There are three dimensions on which discourse tracing operates, Fairlough(1989,1995) argues, firstly discourse tracing uses texts or various forms of spoken or written language, second is discourse practises;the use of production, interpretation and consumption of texts, thirdly is the addressing of social practises in institutions or broader contexts. These analytical discursive practices are also known as the micro, meso and macro levels. In the context of my research question and topic, it is important to identify the turning points at which sustainable development was included in the study curriculum in the University of stavanger. In addition, the discourse practices and processes which stimulated a change in the University as an institution towards sustainability and analyse whether they came about as a result of discourses and practises from the three analytical levels be it the meso,micro or macro levels. This methodology of analysis was chosen because the framework allows for a more transparent and explicit way of moving through qualitative data, especially for data that focuses more on discourse (LeGreco & Tracy,2009)Unlike other analytical methodologies, discourse tracing allows for generation of great insight into what people want a change or makes of something in their everyday lives.(Ibid) One characteristic about discourse tracing is that it enables researchers to illustrate when a condition gave rise to a turning point , and that turning point can be used as a point of departure from which researchers can both move forward or backward in a case.(ibid) this makes a good case for the findings of this research because participants especially the teachers and lecturers included in this research will be asked to the best of their knowledge when Sustainable development was included the study curriculum and this creates a perfect starting point for my discussion in the subsequent section of the thesis.

4.3 Ethical considerations

Adhering to a code of conduct and respecting participant rights when collecting data is one of the hallmarks of academic integrity. In research, ethical considerations are guiding principles that are always held in high esteem by the researcher. (Bhandari,2022) For these reasons,ethical issues such as voluntary participation, informed consent, anonymity, confidentiality and results communication were highly adhered to.Informed consent is a procedure through which a competent participant or subject after having received and understood all research related information can voluntarily provide his or her willingness to participate in a research (Manti & Lican , 2018) Firstly, participants were formally informed about the research, the purpose and rationale behind the research topic before agreeing or declining to partake in the data collection process. I also ensured my language was concise, clear and easily understandable by participants to avoid any miscommunication. I ensured any form of coercion or undue influence was minimised and participants were given a reasonable ample time to consider participation or otherwise. Secondly, I explicitly communicated clearly to the research participants that they were not in any circumstance obliged to continue the research and that they could withdraw from the research when they needed to. In addition, their refusal or acceptance to participate in the research has no negative consequences whatsoever. For Anonymity, I adopted data pseudonymization to replace any form of identification that could be linked to research participants. Bhandari, 2022 argues that in many cases where data is collected in person or by phone or video can not be considered fully anonymous because some personal identifiers are impossible to hide. In this circumstance, data pseudonymization reduces to a great length the ability to identify or personally link participants to the real identity.

4.3.1 Research Credibility

An essential part of research is credibility. Credibility in research is an assessment of whether or not the research findings represent a credible conceptual interpretation of data drawn from the participants. For this research, data was drawn from multiple sources such as participant interviews(primary data) secondary data such as literature and texts from credible online sources such as scopus, google scholar , company websites, review of government reports and policies. As to whether the findings of this research is correct or accurate was a highly

considered factor, however, as espoused earlier, through discourse tracing findings will be analysed. Discourse tracing is a very credible way of analysing data in such a research making my research a credible one as such.

4.3.2 Study Confirmability

Study confirmability is a demonstration of how the research is not affected by biases or assumptions as a researcher. In this context, I must admit that even my selection of research topics was a bit influenced by my bias as being a student of the MEES study program who has genuine interest in Sustainable development. However, to limit such biases against my study, I objectively collected data through interviews and presented findings from participants the way it is without filtering or doctoring any form of my interviews. Also as a researcher, I made sure to follow the direction of the interview and asked for clarification when needed rather than make assumptions based on my preconception or biases.

4.3.3 Study transferability

This can be explained as the degree to which the study can be transferred or generalised in other contexts or settings (Trochim,2023) this may be regarded as the external validity of the research. In the context of this research, the teaching of Sustainable development in higher education is being considered and adapted worldwide amongst countries that ratified the paris agreement and sustainable development goals. The successful implementation and policy review by Norway and University of Stavanger may serve as an exemplary framework for other oil and gas dependent countries and regions to follow suit. In the end, this study may serve as a blueprint for other resource dependent regions to learn from. For the enhancement of transferability of this research, the research context,assumptions and other factors central to this research have been outlined in the introduction and background of the study. At this point, any researcher that finds this study interesting to transfer the results of this study to other contexts is solely responsible for making judgements they find reasonable and applicable.

4.4.4 Study dependability

Another important aspect of this research is the dependability of the study. Dependability can be explained as when another researcher is able to follow all paths and trails used by the researcher to arrive at similar conclusions. (Queen's University,2023) in establishing dependability, the purpose of the study is properly described, rationale behind why data and how long data was collected has been discussed, data interpretation and findings will also be described in the subsequent sections, every other technique used to in determining data credibility have been outlined above, all these and many other decisions I made concerning this research has been explained , making my research a dependable one.

4.4.5 Study limitations

In this section, I will briefly recount some challenges I faced personally during this research and also provide a brief general criticism of my methodology and process in general.

Firstly, as an international student from Ghana who embarked on a two year master study program in Norway, writing my thesis within a Norwegian context proved to be a difficult task. This is because, as qualitative as my study was, I needed to explore and rely on literature both academic, industry and government reports. However, since most of the industry and government reports were written in Norwegian, my research horizon was dwarfed to an extent.

Secondly, since this research involved interviews, scheduling interviews with some offices especially in the stavanger region involved in higher education did not yield any results. I sent out emails to seek the audience of some personalities involved in policy making concerning higher education in stavanger, unfortunately,my emails were not honoured as expected. This I could say affected my research to some extent because ideally, viewpoints from all angles would have enhanced my findings and subsequent discussions .To a larger extent, one could argue based on this limitation that my research was sample or selection bias. It is therefore worth noting , that any future study undertaken based on this research will have access to this demographic to have a broadened and wide scope input from other perspectives.

Thirdly, time constraints may have affected my research findings to an extent. This is because the estimated time frame to gather my data was unfortunately met by the easter break season. This however affects my overall time frame for the study as I had to postpone my data collection dates and reorganise my timelines.

Critiques to my methodology were; i applied the Qualitative research approach, and in general this approach is time consuming and I may have not noticed a particular problem in my study. I also acknowledge my personal experiences as well as knowledge may have affected conclusions of this research knowingly or unknowingly.

4.5 Section Summary

This section has shown the methodological processes, rationale behind decisions made in the study and justifications for decisions made. Some reflections were also made concerning decisions made and methodological conclusions arrived at. All research ethical procedures in a qualitative study were observed.

5. Findings

Owning the 2030 Agenda and the SDGs - Education

The Norwegian government in 2015, after ratifying the Sustainable development goals adopted a national implementation plan and follow up. The Norwegian Ministry of Foreign Affairs established an inter-ministerial group to ensure policy nationwide coherence and coordination. A coordinating ministry has been set up to follow up on various targets of the SDGs and to also ensure that all ministerial targets for implementing the SDGs across all governmental levels are met. (NORDEN, 2017)

Spreading the Agenda 2030 in Norway - engaging with local and regional authorities

The Norwegian local government sector is strong and vibrant. Democratic inclusiveness, empowerment, participation in decision making are all undertaken through this level. At this level is the Norwegian Association of Local and Regional Authorities. It is made up of representation from municipalities, counties and public enterprises under municipal or county ownership. (HLPF REPORT, 2017) Since February 2000, local authorities and ministries have agreed to undertake bilateral stakeholder and consultative meetings.

It is also an established fact that there is a strong contact and communication between central government and local authorities on a wide range of issues covering education, administration and politics. The Norwegian government believed the spread of sustainable development will suffice through the help of educational institutions.

Better Education for Sustainable future -DIKU

DIKU is the Norwegian Agency for International Cooperation and quality education in Higher education. It was established in January 2018 through the amalgamation of three agencies under the Ministry of Education and Research.

DIKU's vision is themed better education for a sustainable future. And that education is the key to ensuring knowledge and skills for a sustainable future for society and individuals.

Policy direction for Higher education- DIKU DIKU intends to communicate with, advise and spread best sustainability practices in the education sector. Also, they serve as the avenue

for national and international training and cooperation , as well as a competence and information centre for international cooperation.

Policy Responsibilities -DIKU

Administrative ; the Norwegian educational sector receives significant administrative assistance from Diku . Also relevant knowledge to the sector is used in the promotion of synergies between Norwegian national and international educational programmes.

Advisory responsibility : DIKU provides advisory inputs to the Norwegian Ministry of education and other educational authorities on the need for sustainable development initiatives from an international perspective.

Direct educational impact of DIKU

Diku serves as a driver to impact competence for fighting societal sustainability challenges. Since they recognize education as the key to ensuring knowledge for a sustainable future, Diku has contributed to creating personal development and opportunities to equip individuals for a diverse society. DIKU has created incentives and measures to stimulate cooperation across subject fields ,sectors, industries and disciplines. Diku also aims at measuring sustainability competencies of teachers and students and to encourage a holistic form of teaching environment where society works hand in hand with teachers, researchers and students. In Norway, DIKU has developed means through which knowledge based information can showcase how international cooperation could help in the development of the study curriculum in schools, especially higher education institutes.

DIKU as a driver for renewing the study curriculum for sustainability

Diku recognizes the ability of competent educators using a research based approach to contribute to good learning quality in higher education institutes. They also acknowledge that through student participation the learning process can be strengthened. Ultimately, as teaching and students' learning outcomes improves, society as a whole is better suited to tackle future problems and challenges.

Diku is also striving to provide initiatives where higher education institutions are given the needed space to develop the study curriculum towards sustainable education

They also aim to create the awareness of how quality education and joint collaboration between teachers,students and educational leaders are all an important recipe in achieving education for sustainability. (DIKU.no 2023)

The Union of Education Norway

A union in Norway which aims to promote sustainable development through educating young people. They believe the teaching profession plays a major role in ensuring future generations are sustainability oriented . The organisation has various regional branches all over the country. These regional branches have the autonomy to draw up their own action plans based on the overarching national union plan.

Education for Sustainable development -Union of Education Norway

The Union of education Norway as part of their civic mandate to society set out these outlined action plans to promote sustainability. The plans are outlined as follows
Advocate on giving sufficient autonomy to teachers and provide frameworks for interdisciplinary co-operation.

Prioritise education for sustainable development in international trade union movements through membership of the Nordic Teachers Council(NLS)

In addition, the Union intends to disseminate knowledge in education for sustainable development by formulating an award scheme for climate change which sheds light on extraordinary achievements by teachers and students in their efforts towards sustainability.

Also, they intend to work assiduously to ensure that leaders and teachers attain the necessary training to enhance the promotion of sustainable development as an interdisciplinary topic .

Moreso, as part of the action plan is the effort to give students a more hands-on experience on sustainable practices in schools and local communities and also influence the allocation of resources by local authorities to these plans. (Union education,2022)

The Bergen Conference

In line with the goals of the United Nation Sustainable Development, the University of Bergen started an initiative to strengthen the commitment of Norwegian higher education

institutions to the UN 2030 Agenda. One of the fundamental proposals of this initiative was to share knowledge, ideas and best practices in line with SDG's. Some of the leading Universities were NTNU, UiB, UiT, NMBU, UiO.

Central to the mandate of the Bergen conference committee was to Present an understanding of sustainable development in higher education institutions and identify the relevant research and education needed for curriculum development in the Universities in Norway.

Develop roadmaps needed for Sustainable development to be taught in the Universities and identify possible solutions to tackle challenges that may arise due to this initiative

Most importantly, build a digital platform where ideas for relevant sustainable development teaching techniques are explored, hold dialogues and presentations with stakeholders and actors in the education ministry to engage them in relevant changes in the study curriculum that needs to be explored.

The bergen conference and policy proposal in study curriculum for universities

In developing the curriculum and knowledge base toward sustainable development, the bergen conference proposed policy directions for universities in Norway to adopt as follows It was suggested that Universities should demand or create learning outcomes related to the SDGs

Also, some degree programs were required to include the SDGs as part of some degree study programs. Conscious efforts were made to also include perspectives on the SDG's in PhD programs as well. Study curricula and textbooks on SDGs were all included in the various universities and mandatory introductory courses on the SDGs were organised for all students in these participatory Universities. Lastly for Universities that had no master or bachelor programs in teaching the SDGs new directives were given to create them.

Policy Implementation; Education about Sustainability - Bergen Conference

After the bergen conference, two main approaches were used by the Universities to inculcate Sustainability in the study curriculum

To create new study programs for Universities that hitherto had no direct sustainability focus
Or To include relevant Sustainable Development topics in existing study programs in the Universities

NTNU has a master program in Urban and Ecological planning with a focus on Sustainability and it is practise based which enables students gain hands on practical experiences to tackle environmental challenges

Bi has a master level course which helps in creating and raising awareness about sustainable business in Africa and provides related knowledge in corporate social responsibility with an environmental perspective.

UiB has developed a Master Degree program in sustainability which supports ongoing developments in masters education towards education for sustainability . The University also has courses in other departments that address sustainability issues.

UiO also has a master degree program in development environment and cultural heritage which addresses a wide range of environmental and sustainability problems faced in our current world ,

Interestingly, NMBU has a study program called Noragric which addresses sustainability issues like environmental management,gender rights and conflict management since 1986.

University of Stavanger

Education towards a sustainable future

In the University of Stavanger, there is a research community established with the theme of transforming education towards a sustainable future. This community aims at bringing together researchers from different disciplines within the faculty of arts and education to tackle approaches used in education for sustainable development.

This research community uses a multidisciplinary approach to engage students and teachers on how learning about sustainable development could help shape our environment and attitudes.

The research community also aims at combining research efforts on practical learning and teaching approaches, various educational environments and attitudes of students to provide a broad point of view in sustainability education through a more holistic way.

Monthly seminars are held where everyone interested in sustainability education gains insights through research and open opportunities for future collaboration in teaching and further studies. (University website)

Strategy for Economic development - Stavanger Kommune

Stavanger aims at leading the energy transitions. With four main strategies set out as focus areas, the region has dedicated the years 2021 to 2030 to achieve these targets. The strategy spans from a) being the energy capital b) agriculture and aquaculture c) industry and technology d) experience and tourism.

From these strategies emanates the action plan which is extensive and more detailed. From the action plan, the Stavanger kommune aims to contribute some goals. Out of the goals are measures related to education which is to develop measures where Stavanger becomes a hub for city, industry and academia to discuss projects related to innovation.

In answering the research question, Is the University proactively involving SD in the study curriculum to shape future society: questions around autonomy, decision making, and other actions taken within the university to propel the change towards sustainability will be explored. Other questions centred around the limitations of the University such as funding and student satisfaction will be explored as well.

Autonomy of UiS

Respondents with expertise in the education sector described the University of Stavanger as a fully autonomous body governed by a University Board. In the words of R1 “ *You know the University Board is what I see to be the highest body in terms of decision making on matters concerning the university, they work within a government framework but still have autonomy over major decisions taken in the University, they have a lot of powers you know: I mean literally, added by R1*”

This opinion was similarly shared amongst all educational expertise interviewed on who makes the rules concerning the University. Respondents also added, all important decisions and choices concerning the development of the University and are within the Jurisdiction of the University are sanctioned by the University board directly or indirectly. It was also added by the respondents that decision and policy direction are undertaken in direct consultation with other stakeholders such as the Norwegian agency for quality assurance in education and the Norwegian centre for international cooperation in higher education

Respondents also added that student representation is also essential in the University Board. There are also other informal councils and research committees which perform advisory duties to the University.

R1 added, *the main task of the University Board is to devise strategies concerning education and research activities to stir development academically. Faculty Boards are also required to be established to implement policies from the University Board. The faculty board also takes important decisions*’

Gaining the understanding of the governing body of the university set the tone for subsequent questions like the University’s proactiveness towards sustainability education. The following are the responses received

Increasing Climate Concerns

For respondents with expertise in education for Sustainability, the first point mentioned was climate concerns . The consensus in their responses was that climate action is needed to mitigate current environmental challenges. Respondents further asserted that to tackle these climate issues, society will have to act in and respond quickly to these issues. Given these circumstances, the University put tackling climate issues as one of the main topics on its strategies. And creating climate awareness and education is one of the fundamental drivers in tackling climate issues. In the words of R2 “ *Personally i think educating our students on sustainability is a fantastic thing to do, looking at what the Paris Agreement and other environmental statistic, we have to help in anyway we can to solve the global problems, when our students gain their expert knowledge on these subjects, they can help society a lot*’.

In addition, some respondents added that climate issues are gaining popularity in general especially industry, media, households etc and so the earlier you catch on with such trending issues as a higher education institution , the better it is to develop and update yourself with society.

Changing market dynamics

Our students should be more equipped to solve environmental crisis in future - says R2 in response to a question on changing dynamic on the market. *Going back some 20 years ago, skills in oil and gas were sought after mainly. But this has changed since some 12 years down . Now companies want graduates with these competencies. This is good for the environment, i think this partly shapes what is being taught here. Because we need people to fill up these new jobs coming up, bringing in their knowledge and competence to help create solutions to environmental problems. So the gap needs to be filled.*

Respondents see the changing market dynamics as a positive thing and a step in the right direction if climate issues are to be tackled. They see the demand for sustainability graduates growing exponentially in the near future, hence why not train young people to be ready for such future jobs.

Respondents believe companies are becoming more and more interested in their contributions to the environment and other sustainability metrics, this makes for interesting times ahead where companies will seek competent graduates in the field .

Funding and research directives

Funding and research directives are one of the factors respondents raised as part of determinants of what is being studied in the curricular. Respondents pointed out that collaboration between academia and industry is stimulated through funding and research. And the interests of the funding industries sometimes influences what goes on in academia. R3 says, *when you have a lot of research requests and funding coming in asking to delve deep into matters concerning sustainable development, then it's only smart that you include education about sustainability in your curriculum. This is not rocket science, these are smart decisions taken by the University*

Respondents also asserted that to combat climate change and solve environmental problems facing humanity will require funding both from the private sector and the public sector. Running the University both administratively and academically requires huge budgetary allocations, PhD programs especially, and so when industry or public sector requests to fund projects related to sustainable development, then the university may want to reconsider and redirect study programs towards sustainability.

The Innovation ecosystem around the University

According to respondents , the University finds itself in a strategic position either knowingly or unknowingly. They further added that there has been an innovation ecosystem such as Ipark and TTO which currently houses more than 150 companies.these innovation companies

sometimes influence what happens in the University. This is because respondents say there are numerous times where the University has collaborated with these innovation companies and when favourable outcomes come from these projects the university wants to take it a bit further.

Respondent R4 added *i think the oil discovery helped shape this city a lot, and this goes a long way to shaping what is studied here, because when you discover oil, you want to build an environment around it that can supply all the needs of such an industry. Now that the green transition is growing stronger, a lot of research and innovation starts coming from the green industry and innovation and research will be steered towards that direction.*

Majority of the respondents believe Stavanger has a history of a vibrant innovation ecosystem, and so it makes it easier to evolve and adapt new ways of thinking quickly. This in essence has helped shape what is being taught at the University because of the ripple effect the innovation ecosystem has .

Social Responsibility of the University

Social Responsibility was an interesting reason raised by respondents. Respondents agree to some extent that they see the study of sustainability in the University as an indirect way to fulfil a sense of social responsibility. Respondents stress that the University over the past years before sustainability education, have been training graduates for many other industries including health and oil and gas. A respondent stresses

I think the University has come far by contributing to the oil and gas exploration in the region. Going forward , if the University wants to train leaders and competencies in sustainability, then it is not far fetched from seeing this as a corporate social responsibility . Spinning the role of the University towards sustainability education is also a smart way of seeing this agenda, it is imperative on us all to help contribute to future solutions, and if it is seen as a social responsibility, that is actually a smart perspective.

Some respondents see Sustainability education as a form of giving back to society and atoning for the sins of the oil and gas industry to the environment. In their opinion, ESD will in the long run be a great beneficiary to the environment and help shape future generations. For a good and quality community life, the contribution of the University is vital. University teachers, administrators and students must participate in such endeavours through teaching and research .

The university must be a shining star and be a beacon of hope for all and especially the community around , this is important to us as teachers. We can only do that through collaborating with society around us and use our expertise to help current and future generations. Says one respondent interviewed..

Image of the University to be trendy and catch up with the status quo

Some respondents believe the Sustainability education at the University is a form of being trendy and recognized as a University helping to solve environmental issues. However, the case is not the same in the outside world. Respondents say they do not see any noticeable difference in reality as against what they studied concerning sustainability in school. In their opinion, they believe ESD is being integrated in the curriculum because its adoption is ubiquitous and not necessarily effecting any immediate change in the short term.

As a former student of Sustainability Education, I can tell from my personal experience that the outlook outside the school setting is different, the struggle is real, and you don't find a direct pathway for your career; it tilts a bit towards not matching what you studied with what industry wants. This makes you wonder if the study program was indeed planned and coordinated to meet industry needs. I must say my expectations before and after my study of sustainability are a complete opposite on the spectrum.

Respondents based on their expectations before and after the study program suggests ESD in the context of UiS was initiated basically to fit in the current trends worldwide about sustainability and not necessarily make direct impacts to industry and society at large.

University leadership and Commitments

Some respondents highlight the commitments of the University leadership as a major factor considering the direction of the university towards ESD. They are of the view that since decisions concerning targets and directions of the University is mainly taken by the University board, they point out that it takes a sustained commitment to make conscious efforts in making ESD a big reality in the University, however, respondents highlighted a limitation such as a change of rector as possible factors that could affect targets set by a preceding rector.

6. Discussion

In answering the research questions using the discourse tracing as qualitative practise, findings will be discussed below.

6.1 Policy Driven Initiatives

Institutional changes are seen to be a big turning point in the dynamics and daily routines of every system. The introduction of ESD in the UiS is seen as a prime example of institutional change. However, these changes did not come by in isolation, based on the findings in the previous chapter, we see that there have been nucleated efforts from many avenues and stakeholders in broader efforts to ensure Sustainable Education gains a foothold in Stavanger and Norway at large.

First, from the macro level, one may be of the opinion that ESD was adopted at the University of Stavanger as a result of policy directives. This opinion may be supported by evidence from the findings in the 2030 strategy for the University of Stavanger. In the heart of the 2030 strategy is the green transition which states categorically the policy direction of the University towards achieving sustainability targets. This could be evidently shown as a strong commitment of the University in making ESD a reality.

From these strategies are other commitments such as a long standing collaboration between the University and other relevant bodies in research and innovation.

Also at the macro level are regional policy commitments and strategies that are directly or indirectly linked to the University strategy. In Norway, universities perform their duties under the auspices of the Ministry of education in charge of Higher education institutes. Funding is disbursed to the Universities through Ministerial budgetary allocations and the ministry has oversight responsibility of regulations that concern higher education institutes. One may argue, due to the level of importance vested in the ministry of education by the government, ministerial policies and strategies are considered and adopted by Universities for which the University of Stavanger is part and parcel.

Consequently, at the macro level, a ministerial policy could affect a policy change at the University in a trickle down manner. A typical example is the Bergen declaration or charter in 2005, where European education ministers and other consultative members were admonished to promote the European system of higher education based on the principles of sustainable

development. Taking into consideration the Bologna process for establishing a European higher education area.

A similar instance of a trickle down policy at the macro level can be said of the international policy ratification of Norway. Currently, Norway has ratified and is an active member of the UN SDGs as well as the Paris Agreement. These international organisations have policy strategies and directives outlined from which member countries could implement their strategies. The policies of the international bodies are straightforward and concise on the importance of ESD at the international, national, regional and local levels of society. Member countries of such organisations adopt international policies as guidelines when drafting theirs. As such, a policy concerning sustainability for higher education at the international level may have an effect on ESD at the University of Stavanger. A typical example is the Graz Declaration in 2005 on Committing Universities to Sustainable development in Austria. This Declaration called on all Universities globally to give recognition or status to sustainable development in their strategies and activities. It additionally called for Universities globally to use the SDGs as a framework when engaging on social dimensions.

Bekessy et al (2007) argues further that, while all these international commitments provide a visual commitment towards progress, they are not sufficient enough to spark institutional changes and practises in higher education institutes. He further argues that government support and commitment as well as international partnerships are needed to ensure policies come to fruition. This may particularly buttress evidence from the findings where we notice that Norway, even though it has ratified these international charters, has gone ahead to show extra commitment on the part of the government to implement policies concerning higher education institutions and sustainability.

6.2 Inter and Intra University level policies.

In Norway, universities under law are autonomous, this makes universities operate and run institutionally and administratively without external interference. The autonomous status allows universities to also formulate and commit to policies that best suit their future

strategies and ambitions. However, as mentioned previously, Universities do not operate in isolation from the government, they are regulated and supervised subtly by ministries of education. Hence the Sustainable development in the curriculum in University of Stavanger may have been as a result of directives coming from the central government.

Moreso, evidence from findings have shown that Universities in Norway have a strong alliance convention where matters concerning Universities are discussed and policies are formulated and implemented. Notable ones are particularly evident from the Bergen Conferences in 2005 2019 and 2021 respectively. Excerpts from this conference shows that rectors from various Universities as well as stakeholders from the government enact policies related to ESD which are then implemented by the various universities. One may attribute these occurrences as one that triggers the University of Stavanger to react to policy .

6.3 Evidence from new tuition payment policy.

In Norway, higher education has been free for all including qualified international students from all over the world. International students enjoy the same rights to higher education just as every other Norwegian citizen enjoys. However, in recent years, these tuition free policies have been overturned and students are required to pay tuition to be able to study in Norway for their higher education. This has been cited to be a case where policy from the government could directly influence what is happening in the Universities. Others may argue the autonomous nature of Universities provides them the right to overrule certain governmental decisions but this is clearly not the case, however the autonomy of universities to some extent allowed universities to determine amounts of tuition on international students.

6.4 Climate concerns from top down and bottom-up

Over the past few years, climate concerns have gained grounds in political ,social and economical discussions in Norway. The concerns may come from several angles, from the top down; one may argue this is as a result of the UN and the Paris agreement and other international institutions the country is a member of. On the other hand however, one may also find society and pressure groups (who have noticed in real time the negative environmental impacts they are facing from climate change) also agitating and calling for

something to be done about climate issues. While these push and pull forces are ongoing, the University finds itself caught in the middle as a keen observer. Interestingly, any resolutions that may arise in the end may affect policies regarding sustainability at the University.

Typically, if a policy geared towards sustainability as a result of climate change comes from the International level down to the national level, the scope of political policy in Norway permits such policies to penetrate down to the local level. By doing so, Universities directly or indirectly have a feel of these policies and may have been influenced. On the other hand, Norway has a vibrant individual climate activism especially amongst young people at the grassroots level. This enables bottom-up influencing by the people toward policy.

In all, it is argued that both the bottom-up and top-down activities by either stakeholders, influencers, opinion leaders and politicians may institute policies that could directly or indirectly find a way to influence Sustainability in a particular society, consequently determining what is being studied at the University of Stavanger.

6.5 Market Dynamics as a factor

As to whether the University of Stavanger is being proactive or reactive in the quest to integrate sustainability in the study curriculum, it is better to note this very important factor. As climate change becomes increasingly persistent in our everyday lives, great and competent minds are needed to create solutions to these pertinent issues. Hence, expertise in the field of sustainability will be needed to fill these gaps needed in the field. The current energy market is known to be oil and gas dominated, however, it is also known that the energy transitions will create thousands of jobs in the next couple of years ahead.

Statistically, jobs created in the green transition are known to be rising at an exponential rate, signalling a good prospect for students learning to be competent in the field. According to FTSE Russell 2018, there are about 3000 companies listed globally known to be exposed to the green economy. (OECD, 2019, pp 15) This number has risen since 2009 by 20%.

According to analysts, this shows a significant investment and job creation opportunity for green transitions. With this in mind, attempts by a University and specifically, University of Stavanger to introduce ESD in the study curriculum may be deemed an intelligent, smart and foresighted policy. In other words, one may assert that the university of Stavanger was not reactionary but rather proactive in their strategy to empower future competent individuals to solve environmental problems for society. And they did so by introducing Sustainable development in the curriculum.

6.6 Funding for research

Funding may be an important factor to whether the University of Stavanger may be influenced by external policies rather than being proactive with ESD. In Norway, there is an established formal relationship between the funding systems and National higher education policies.(OECD,2006) It is known that the Ministry of education through the funding system introduced the quality reform structure where higher education institutions receive funding and are incentivised based on results. The rationale behind this reform adopts the saying “*to whom much is given much is expected*” . According to the Mjos committee, this approach was the appropriate one because society rightfully deserves to see results when huge resources are invested in higher education (NOU 2000; OECD 2006 p 6)

Although this reform seems to have been working and achieving the intended results , it however generated an unintended result. These unintended results were highlighted by the Rectors Conference. Due to the nature of funding in the Norwegian education context, a zero sum game would have resulted due to competition by higher education institutions to win funds. One main consequence raised by the rectors conference is the possibility of promoting popular or trendy courses and neglecting the unpopular. It is believed that funding influences institutional strategies in unintended ways by causing institutions to act like market players, being on the alert for study programs and research that is in demand on the job market. And so in the case where competencies in oil and gas remain high in demand , the university of stavanger may respond to that by channelling institutional attention to that, leaving sustainability related programs vulnerable. It is also perceived that funding may greatly affect institutional strategies and as such a possible negative consequence on study programs.

Essentially, this may confirm assertions from the findings that funding plays an essential role in determining what is being studied at the University and more so, whether the university is being proactive towards the inclusion of sustainability in the study curriculum.

Contrarily, there are limitations to such an endeavour in the sense, in the case where funding and research interests gravitates towards a different subject area or field in Norway, then study programs such as ones in Sustainability - which is not a traditional study program but still in novelty, may be greatly affected or become unpopular subsequently. In the case of the University of Stavanger, study programs believed to be in the oil and gas field , may be

awarded funds and research interests more than the ones in sustainability under the social science faculties.

6.7 The role of innovation

Chesbrough , 2003 asserts that the relationship between Universities and companies have changed immensely. Considering how fast paced and sophisticated contemporary innovation is, external help is constantly sought by companies in pursuing research and development. Relevant knowledge and improvement in R & D is consistently acknowledged by stakeholders in the innovation ecosystem as an important component. That being said, as to whether the innovation cluster could be a possible determinant to what is being studied at the University is not far fetched. Reason being, Stavanger had already established a working and vibrant innovation ecosystem prior to the University of Stavanger officially gaining the Higher education University status. Stakeholders in the innovation cluster are known to possibly play an important role in funding and establishing some research and master degree programs at the University. The Innovation ecosystem is also known to be an ardent partner of research with the University as well as a valuable space which draws competent skill from the University concerning relevant research interests. As much as Universities may want to determine study curriculum and teach what is best to students, research interests from innovation ecosystems may steer University study curriculums to their favour.

In Stavanger , the innovation ecosystem is considered to be one of the major backbones of the regional economy and even the country Norway at large. Hence an important stakeholder in the affairs of Institutions such as the University of Stavanger. Therefore, one may ascribe changes in the study curriculum towards a certain direction as one that may be stimulated by directives and strategies by the innovation ecosystem.

6.8 Social responsibility of the University.

Governance in Norway is known to be leaning towards being a democratic social welfare state even though debatable by expertise in politics. As a social welfare state, social welfare is felt in all institutions and administrative endeavours of the country. Many institutions see social welfare as a form of giving back to society and overall social upliftment. The case of the University of Stavanger in this context may be valid. The University of Stavanger is

known to have been a direct or indirect contributor to the oil and gas industry over the years especially with the supply of skilled labour and research . Therefore in principle, one may argue that the introduction of Sustainability education in the University is as a result of proactive measures taken by the Institution to give back to society and help society address environmental concerns associated with climate change.

The same can be extended beyond stavanger and norway at large. This is because the University of Stavanger consists of a diverse international student population ranging from different backgrounds of society in the world. Therefore when international students are trained with competencies in sustainability, they become valuable assets to their respective countries , which in turn contributes to the social responsibility of the University giving back to society.

6.9 Sustainability as a trend in Universities.

After the covid 19 pandemic institutions became further enlightened on the need to make progressive efforts towards sustainability. Universities especially were hit substantially by the effects of such a pandemic. From a global perspective, sustainability initiatives are ongoing across higher education institutions. In Norway higher education institutions are reexamining their role and position in society in numerous ways. These come on the back of sustainability and climate issues as a trend. In the recent past , climate protests have become increasingly popular in Norway even to the extent of political discussions and debates. These climate activists and protesters constitute a large percentage of young people who see sustainability as a very important agenda to be taken seriously at every decision making level. Interestingly, the youth in climate protests demand certain bold steps taken by decision makers of society , one of such demands is to include and embed sustainability education in education curriculum to help them better understand the dire situation at hand, and be better handlers of the future environment through competency and research. This particularly supports the reports of UNESCO 2022, which states that students demand education on climate change that will help them to understand and take better action about human activities against climate change, they demand also that climate change should be taught as an interdisciplinary subject and address the complex environmental challenges society faces, climate change solutions should be more fun and learner centred , engaging communities to address climate change issues through solution oriented approaches and lastly have more say in decision making processes in schools.(UNESCO 2022)

In essence, the University of Stavanger finds itself in a similar situation other Universities are facing globally from young protesters. These demands signal a message to decision makers of what the youth want with regards to sustainability and are therefore considered to be implemented eventually. This may be the case of the University of Stavanger here considering the proactiveness of the University in implementing sustainability education.

6.9.1 Commitment of University leadership and teachers

Education for Sustainable development is seen to be an all inclusive concept which involves the efforts of all and sundry. The role of teachers is seen to be a very important aspect in achieving a sustainable society. For teachers, they are seen to be the conveyers of knowledge to future generations. In their simplest of ways, teachers are expected to be knowledgeable enough and enthused about sustainable development to be able to facilitate sustainability related content in the study curriculum. In addition, teachers are seen to be public intellectuals and it is expected of them to be exemplary models whom future generations could learn from. By doing so, they are expected to actively stay committed to sustainability related subjects and subjects in the study curricular as well as engage students in active thinking about solutions for environmental problems. (SDG reports 2020 on Norway)

Similarly for University leadership, their commitment comes in varied ways such as encouraging faculty staff members to think sustainably, encouraging student bodies to be more inclusive in transdisciplinary activities towards sustainability. For University leadership to be able to achieve a shift towards sustainability in the curricular commitments to university strategies will have to be entrenched. This is however a major concern due to administrative changes that happen when new rectors and school leadership are appointed on a tenure basis.

7. Conclusions and Recommendation

This study took a retrospective approach in tracing discourses leading to current sustainability establishments in the study curriculum of the University of Stavanger. The study suggests there is a strong policy by both government and higher education institutes in embedding sustainability in the study curriculum. Retrospectively, efforts have been made through policy directives and strategies to ensure sustainability gains a foothold in the study curriculum. However, with the oil and gas industry remaining the most dominant industry in Stavanger, sustainability continues to play second fiddle across the innovation ecosystem including the University of Stavanger. The University of Stavanger finds itself at the very crossroads of the energy transition. On one hand, the University continues to produce competent graduates in the oil and gas industry and on the other hand the University through policy and strategy is determined to assist the energy transitions through educating students in sustainability. Through the use of discourse tracing, coupled with semi structured interviews to gather qualitative data, the research questions were answered. It can be said that there has been a conscious effort from relevant stakeholders such as the Norwegian government, ministry of education, educational groups, institutional leaders (rectors), faculty staff and students or pressure groups to ensure that sustainability education becomes reality. These institutional changes that happened over time were analysed through the Multi level perspective as well as the pragmatist deductivist perspective. From the onset, one may think sustainability in the study curriculum was as a result of a Norwegian government directive suggesting a top down approach to policy. However through these transition theories, one is provided with an in depth understanding of how bottom up dynamics could also influence policy. In all, the findings of this study suggests that policy is not the only avenue through which changes are effected in the University of Stavanger. However, what it takes is the existence of a buoyant and enabling environment in the innovation ecosystem where necessary foundations are laid to enable such a policy to thrive. Throughout the study, we find that study facilitators request the need for strong commitments towards sustainability education in terms of being pragmatic and engaging the minds of students to be conscious about sustainability. Additionally, University leadership is expected

to exercise their autonomous stature and stay truly committed to a sustainability agenda amidst fear of cut of funding and research interests from sources of funds.

Moreso, students are not satisfied with what competencies current study programs in sustainability provide for them and now they can apply them practically on the job market. Overall, for the targets of the energy transitions to be realised, it takes the efforts of not just policy, but necessary accompanying structures put in place especially on the human capital . Education serves as a means to enrich human capital for sustainability , by providing necessary competencies and promoting interdisciplinary research and collaboration, therefore education for sustainability does not only bridge the gap between society and academia, it serves as a tool in fighting the impending climate crisis ahead.

7.1 Recommendations

In all, this study has outlined that , over past years Sustainability efforts have been made in terms of policy towards education, however, strong monitoring of these policies are lacking. This study recommends a committee set up by the Norwegian ministry of education to follow up on sustainability policies enacted for higher education institutions. This committee should be mandated to encourage the adherence of teaching sustainability in study programs, ensuring the right environment is created for higher institutions to thrive without fear or favour.

Secondly, this study recommends the University leadership to stay committed to its sustainability strategy including expanding the scope of sustainability from a few study programs to almost all study programs in the University. In that way the University contributed extensively to the sustainable development agenda and eventual climate change mitigation. In addition, funding for Universities should be paid critical attention , and measures should be put in place to avoid a funding distribution bias where the most funded study programs are those which have market demand at the expense of emerging and relatively new study programs which promote environmental sustainability.

Thirdly, this study recommends study facilitators and teachers to be more pragmatic and train, think and practise themselves personally in matters of sustainability to enable them become better examples students can emulate in society. Also teachers and facilitators are encouraged to engage students in practical critical and creative thinking on solving

environmental problems and allow students to freely express themselves in finding a myriad of solutions to common environmental problems faced by society.

Most importantly to address the issue of student satisfaction of the Sustainability programs, this study recommends a review of the current sustainability programs at the University of Stavanger. Thus a comprehensive review of what exact competent skills required of sustainability graduates on the job market vis a vis that which is being taught in school. This makes a win-win situation for the parties involved when students are satisfied, school facilitators are also satisfied and industry is satisfied for the betterment of the environment and society at large.

Lastly, this study recommends a strong collaboration between society, industry, the innovation park and academia towards sustainability. Even though there is an existent collaboration between these entities, there seems to be a weak relationship between the entities mentioned and the pure social science world. Bridging the gap between these entities will forge a strong coalition to tackle environmental and climate crises we face as a society.

References

- Bardal, K. G., Reinart, M. B., Lundberg, A. K., & Bjørkan, M. (2021). Factors facilitating the implementation of the sustainable development goals in regional and local planning—experiences from Norway. *Sustainability*, 13(8), 4282.
- Bekessy, S. A., Samson, K., & Clarkson, R. E. (2007). The failure of non-binding declarations to achieve university sustainability: A need for accountability. *International Journal of Sustainability in Higher Education*.
- Blaikie, N., & Priest, J. (2019). *Designing social research: The logic of anticipation*. John Wiley & Sons.
- Brundtland, G. H. (1985). World commission on environment and development. *Environmental policy and law*, 14(1), 26-30.
- Carley, M., Kirk, K., & McIntosh, S. (2001). *Retailing, sustainability and neighbourhood regeneration* (p. 64). York: Joseph Rowntree Foundation.
- Chichilnisky, G. (1997). What is sustainable development?. *Land Economics*, 467-491
- Chichilnisky, G. (1997). What is sustainable development?. *Land Economics*, 467-491.
- Climate and Environmental Plan Stavanger 2018-2030 - Final Version. (2018). Stavanger Municipality. Retrieved from <https://www.stavanger.kommune.no/Global/Klima%20og%20energi/Klima-%20og%20milj%C3%B8plan%20Stavanger%202018-2030%20-%20Sluttrapport%20-%20EN%20FINAL.pdf>
- Cortese, A. D. (2003). The critical role of higher education in creating a sustainable future. *Planning for higher education*, 31(3), 15-22.

Creswell, J. W., Klassen, A. C., Plano Clark, V. L., & Smith, K. C. (2011). Best practices for mixed methods research in the health sciences. *Bethesda (Maryland): National Institutes of Health, 2013, 541-545.*

Dedehayir, O., Mäkinen, S. J., & Ortt, J. R. (2018). Roles during innovation ecosystem genesis: A literature review. *Technological Forecasting and Social Change, 136, 18-29.*

Dedehayir, O., Mäkinen, S. J., & Ortt, J. R. (2018). Roles during innovation ecosystem genesis: A literature review. *Technological Forecasting and Social Change, 136, 18-29.*

DeJonckheere, M., & Vaughn, L. M. (2019). Semistructured interviewing in primary care research: a balance of relationship and rigour. *Family medicine and community health, 7(2).*

Dewey, J. (1929/1958). *Experience and nature* (2nd ed.). new York: Dover.

Dewey, J. Sacred Heart University Library (2020). *Organizing Academic Research Papers: Types of Research Designs* [online]. Available at: <https://library.sacredheart.edu/c.php?g=29803&p=185902> (1938/1997). *Experience and education*. new York: Simon and Schuster

E.S. Fiselier, J.W.S. Longhurst, G.K. Gough Exploring the current position of ESD in UK higher education institutions *Int. J. Sustain. High Educ., 19 (2) (2018), pp. 393-412, 10.1108/IJSHE-06-2017-0084*

Fairclough, N. (1989). *Language and power*. White Plains, NY: Longman.

Fairclough, N. (1995). *Critical discourse analysis*. White Plains, NY: Longman.

Finnveden, G., Friman, E., Mogren, A., Palmer, H., Sund, P., Carstedt, G., ... & Svärd, L. (2020). Evaluation of integration of sustainable development in higher education in Sweden. *International Journal of Sustainability in Higher Education, 21(4), 685-698.*

Foss, L., & Gibson, D. V. (2015). The entrepreneurial university: Context and institutional change. In *The Entrepreneurial University* (pp. 1-17). Routledge.

Geels, F. W. (2010). Ontologies, socio-technical transitions (to sustainability), and the multi-level perspective. *Research policy*, 39(4), 495-510.

Geels, F. W. (2011). The multi-level perspective on sustainability transitions: Responses to seven criticisms. *Environmental innovation and societal transitions*, 1(1), 24-40.

Geels, F. W. (2011). The multi-level perspective on sustainability transitions: Responses to seven criticisms. *Environmental innovation and societal transitions*, 1(1), 24-40.

Georghiou, L. (2015). Improving the framework conditions for R&D. *Presentation at the opening up to an ERA of innovation, Brussels*, 22-23.

Gilbert, N. (2008). Research, theory and method. *Researching social life*, 2.

Glyphis, J. (2001, August). How can the architect contribute to a sustainable world. In *Proceedings of the Wingspread Conference* (pp. 24-26).

Hölsgens, R., Lübke, S., & Hasselkuß, M. (2018). Social innovations in the German energy transition: an attempt to use the heuristics of the multi-level perspective of transitions to analyze the diffusion process of social innovations. *Energy, Sustainability and Society*, 8(1), 1-13.

Huang, M. T., & Zhai, P. M. (2021). Achieving Paris Agreement temperature goals requires carbon neutrality by middle century with far-reaching transitions in the whole society. *Advances in Climate Change Research*, 12(2), 281-286.

Kemp, R., Schot, J., & Hoogma, R. (1998). Regime shifts to sustainability through processes of niche formation: the approach of strategic niche management.

Lambert, Mike. 2012. *A beginner's guide to doing your education research project*. Los Angeles: SAGE.

Leal Filho, W., Manolas, E., & Pace, P. (2015). The future we want: Key issues on sustainable development in higher education after Rio and the UN decade of

education for sustainable development. *International Journal of Sustainability in Higher Education*, 16(1), 112-129.

Leal Filho, W., Raath, S., Lazzarini, B., Vargas, V. R., de Souza, L., Anholon, R., ... & Orlovic, V. L. (2018). The role of transformation in learning and education for sustainability. *Journal of cleaner production*, 199, 286-295.

Leal Filho, W., Vargas, V. R., Salvia, A. L., Brandli, L. L., Pallant, E., Klavins, M., ... & Vaccari, M. (2019). The role of higher education institutions in sustainability initiatives at the local level. *Journal of Cleaner Production*, 233, 1004-1015.

LeGreco, M., & Tracy, S. J. (2009). Discourse tracing as qualitative practice. *Qualitative Inquiry*, 15(9), 1516-1543.

Lundberg, C., & Lindström, K. N. (2020). Sustainable management of popular culture tourism destinations: A critical evaluation of the twilight saga servicescapes. *Sustainability*, 12(12), 5177.

Machi, Lawrence A., and Brenda T. McEvoy. 2016. *The literature review: Six steps to success*. 3d ed. Thousand Oaks, CA: Corwin.

Martin, R., & Sunley, P. (2006). Path dependence and regional economic evolution. *Journal of economic geography*, 6(4), 395-437.

Meadowcroft, J. (2007). Who is in charge here? Governance for sustainable development in a complex world. *Journal of Environmental Policy & Planning*, 9(3), 299-314.

Merton, R. K. (1967). *On theoretical sociology: five essays, old and new* (No. HM51 M392).

Patton, M. Q. (2002). Two decades of developments in qualitative inquiry: A personal, experiential perspective. *Qualitative social work*, 1(3), 261-283.

Redden, S. M. (2017). Discourse tracing. *The international encyclopedia of communication research methods*, 1-10.

Rip, A., & Kemp, R. (1998). Technological change. *Human choice and climate change*, 2(2), 327-399.

Sandelowski, M. (1996). One is the liveliest number: The case orientation of qualitative research. *Research in nursing & health*, 19(6), 525-529.

Seyfang, G., & Smith, A. (2007). Grassroots innovations for sustainable development:

Silva, M. E., Silvestre, B. S., Ponte, R. C. D. V., & Cabral, J. E. O. (2021). Managing micro and small enterprise supply chains: A multi-level approach to sustainability, resilience and regional development. *Journal of Cleaner Production*, 311, 127567.

Silvestre, B. S. (2014). Capability accumulation, innovation, and technology diffusion: Lessons from a Base of the Pyramid cluster. *Technovation*, 34(5-6), 270-283.

Silvestre, B. S. (2015). Sustainable supply chain management in emerging economies: Environmental turbulence, institutional voids and sustainability trajectories. *International Journal of Production Economics*, 167, 156-169.

Strehl, F., Reisinger, S., & Kalatschan, M. (2007). Funding systems and their effects on higher education systems.

Taylor, J., & Van Every, E. (2000). *The emergent organization: Communication as its site and surface*. Mahwah, NJ: Lawrence Erlbaum.

TSchot, J., & Geels, F. W. (2008). *Strategic niche management and sustainable innovation journeys: theory, findings, research agenda, and policy*. *Technology analysis & strategic management*, 20(5), 537-554. *Technology analysis & strategic management*, 10(2), 175-198.

TSilvestre, B. S., Monteiro, M. S., Viana, F. L. E., & de Sousa-Filho, J. M. (2018). Challenges for sustainable supply chain management: When stakeholder collaboration becomes conducive to corruption. *Journal of Cleaner Production*,

194, 766-776.owards a new research and policy agenda. *Environmental politics*, 16(4), 584-603.

UNESCO-UNEP International Strategy for Action in the Field of Environmental Education and Training for the 1990's. Congress on Environmental Education and Training, Moscow, Paris and Nairobi, 1988.

Vasileiou, K., Barnett, J., Thorpe, S., & Young, T. (2018). Characterising and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period. *BMC medical research methodology*, 18, 1-18.

Wickman, P. O. (2012). Using pragmatism to develop didactics in Sweden. *Zeitschrift für Erziehungswissenschaft*, 15(3), 483-501.

Zguir, M. F., Dubis, S., & Koç, M. (2021). Embedding Education for Sustainable Development (ESD) and SDGs values in curriculum: A comparative review on Qatar, Singapore and New Zealand. *Journal of Cleaner Production*, 319, 128534.

Dedehayir, O., Mäkinen, S. J., & Ortt, J. R. (2018). Roles during innovation ecosystem genesis: A literature review. *Technological Forecasting and Social Change*, 136, 18-29.

Consent Form

Are you interested in taking part in the research project

“(Sustainable Development in the study curriculum and the impacts to society)”?

Purpose of the project

You are invited to participate in a research project where the main purpose is to

Ascertain how the teaching of sustainable development in university of Stavanger has impacted society especially the innovation ecosystem. This is a master thesis project being undertaken solely for research purposes. The overarching research question for this thesis is the University of Stavanger teaching sustainable development as a reactionary measure to policy or is the University of Stavanger being proactive in the wake of climate change and its associated effects

Which institution is responsible for the research project?

[University of Stavanger] is responsible for the project (data controller).

Why are you being asked to participate?

You have been asked to participate in this study because you are a stakeholder/possess a vivid understanding of the research for which your inputs will contribute significantly to understanding and answering the research question. This letter is extended to persons in the MEEs program (teachers and students) and participation is optional.

Permissions from the NSD may have been obtained to reinforce data protection

What does participation involve for you?

- "I would like to obtain some information about you through an audio recorded interview session. This will be information about the University of Stavanger reacting to policy or being proactive, what sustainable development teaching means to the job market dynamics, students opinions about what they have studied and what it means for them outside

of school. The information is obtained by conducting a semi structured interview.

Participation is voluntary

Participation in the project is voluntary. If you chose to participate, you can withdraw your consent at any time without giving a reason. All information about you will then be made anonymous. There will be no negative consequences for you if you chose not to participate or later decide to withdraw.

Your personal privacy – how we will store and use your personal data

We will only use your personal data for the purpose(s) specified here and we will process your personal data in accordance with data protection legislation (the GDPR).

Personal data will be processed confidentially for the purposes of this thesis and in accordance with the data protection legislation. Your name and any personal form of identification will be strictly held confidential and saved in codenames which will be encrypted.

What will happen to your personal data at the end of the research project?

The planned end date of the project is [15 /07/23]. . All voice recordings will be deleted after transcription and analysis.

Your rights

So long as you can be identified in the collected data, you have the right to:

- access the personal data that is being processed about you
- request that your personal data is deleted
- request that incorrect personal data about you is corrected/rectified
- receive a copy of your personal data (data portability), and
- send a complaint to the Norwegian Data Protection Authority regarding the processing of your personal data

What gives us the right to process your personal data?

We will process your personal data based on your consent.

Based on an agreement with University of Stavanger], The Data Protection Services of Sikt – Norwegian Agency for Shared Services in Education and Research has assessed that the processing of personal data in this project meets requirements in data protection legislation.

Where can I find out more?

If you have questions about the project, or want to exercise your rights, contact:

- [\[University of Stavanger\]](#) via [\[Thomas.sattich@uis.no\]](mailto:Thomas.sattich@uis.no) or s.agyare@stud.uis.no.
- **Our Data Protection Officer:** [\[personvernombud@uis.no\]](mailto:personvernombud@uis.no)

If you have questions about how data protection has been assessed in this project by Sikt, contact:

- **email:** [\[personverntjenester@sikt.no\]](mailto:personverntjenester@sikt.no) **or by telephone:** +47 73 98 40 40.

Yours sincerely,

Project Leader
(Thomas Michael Sattich)

Student (Stephen Agyare)

Consent form

I have received and understood information about the project [Sustainable development in the study curriculum and the impacts to society] and have been given the opportunity to ask questions. I give consent:

- to participate in (a semi structured interview)
- to participate in (in person / online video interview) – if applicable

I give consent for my personal data to be processed until the end of the project.

(Signed by participant, date)

Interview Guide

1. In your opinion do you think the teaching of sustainable development in the University has been a reactionary or proactive approach to policy?
2. In what ways is the teaching of sustainable development affecting society?
3. Who makes the rules in determining what is to be studied in the curriculum
4. Do you think the economy around the university plays a role in what is being studied at the University?

