NTNU

Norwegian University of
Science and Technology

# Application of the Sustainability Literacy Test at NTNU

A study on integration of the SULITEST as tool for learning and testing sustainability literacy


## Charlotte Solveig Engeseth Teigen


Globalization
Submission date: June 2018
Supervisor: John Eilif Hermansen, IØT
Co-supervisor: Haley Knudson, IØT


Norwegian University of Science and Technology
Department of Industrial Economics and Technology Management

## Problem description

Higher education is a very important target group for developing knowledge and skills to achieve the UN's sustainability goals. How can universities be better at including sustainability in the developing of study programs and courses so that students acquire knowledge and competence that are required to face the complex challenges?
How can universities include sustainability in the curriculum and measure knowledge and skills within and across different disciplines.

This study will look into where Sulitest can be used at NTNU and how Sulitest can help NTNU contribute to the Agenda 2030 and measure their progress inside the university and compared to other universities in Norway, the Nordics, Europe and Globally.

# Preface

This thesis completes my 2 year interdisciplinary master degree in Globalization: Transnationalism and Culture at NTNU, it have been conducted at the department of Industrial Economics and Technology Management in the spring term 2018.

The background for this study have been to learn more about how Sulitest, a tool developed at Kedge Business School in Marseille and introduced at NTNU through the Nordic Sulitest could be used by a broader academic community at NTNU and in a longer term be a tool that all students have access to. It was a small group that was involved during the Nordic Sulitest Project Period with only 5 courses on NTNU participating in Sulitest, and the goal for this study was to include approximately 150 students in the spring term. We ended up with 300.

During the process with this thesis have I been working for inclusion of Sulitest at NTNU from the next school year. I have presented the Sulitest for the advisory board n Education at the department of Social and Educational Sciences that probably will include it in some of their study programs from the school year 18/19.

Sulitest and some of the results from this study have also been presented at the Conference its21: the 4th conference on interdisciplinary teamwork skills. In the audience was several represents from EiT and one of the other universities in the audience have now signed up for using Sulitest.

I would like to thank my supervisor Associate Professor John E. Hermansen for good advice, all his help and patience during the process writing this thesis, I would also thank my co-supervisor Assistant Professor Haley Knudsson. I would also send a big thank you to Sulitest, especially Anja Stoll, Head of Community and Content Development and Professor Aurelien Decamps, Academic Coordinator and co-funder and for their information, support and advice. I would also say thank you to Meeri Karvinen, Doctoral Candidate and Project coordinator at Aalto University (Finland) for helpful information about the Nordic Sulitest.

I will also thank all students and teaching staff that have taken time to participate and give feedback about the Sulitest. Without you it wouldn't have been any data available. An extra thanks to the department of social and educational science, especially vice dean Tine Artnzen Hestbek for your time and for letting us come in to you're meetings.

# List of Tables

# List of Figures

# Abbreviations

| | |
|---|---|
| COP21 | 21st Conference of the Partners |
| DESD | Decade on Education for Sustainable Development (2005-2014) |
| EiT | Experts in Team |
| EMS | Environmental Management Systems |
| ESD | Education for Sustainable Development |
| GAP | Global Action Programme |
| GMV | Göteborgs centrum for hållbar utveckling/Centre for Environment and Sustianability |
| GU | Göteborgs Universitet/University of Gothenburg |
| HEI | Higher Education Institutions |
| HESI | Higer Education Sustainability Initiative |
| HQ | Headquarters |
| ISCN | International Sustainable Campus Network |
| KTH | Kungliga Tekniska Högskolan/Royal Institute of Technology |
| NTNU | Norwegian University of Science and Technology |
| NSCN | Nordic Sustainable Campus Network |
| NSD | Norsk senter for forskningsdata/Norwegian centre for research data |
| PAA | Priority Action Area |
| PRME | Principles for Responsible Management Education |
| Rio+20 | The United Nations Conference on Sustainable Development in 2012 |
| RU | Roskilde University |
| SULITEST | the Sustainability Literacy Test |
| SDGs | Sustainable Development Goals |
| SDSN-NE | Sustainable Development Solutions Network Northern Europe |
| TSO | Tematisk satsingsområde/Strategic Research Area |
| UN | United Nations |
| UNCTAD | United Nations Conference on Trade and Development |
| UNCSD | *See Rio+20* |
| UNESCO | United Nations Educational, Scientific and Cultural Organisation |
| UN-DESA | United Nations Department of Economic and Social Affairs |
| UNFCCC | United Nations Framework Convention on Climate Change |
| UN-HABITAT | United Nations Human Settlements Programme |
| UN HLPF | United Nations High Level Political Forum |
| UNU | United Nations University |
| UiO | Universitet i Oslo/University of Oslo |

# Abstract

Higher Education has a responsibility to contribute to sustainable development, especially through education. The SDGs and the Global Action Programme for ESD both is giving education guidelines for how to contribute with giving learners the skills and knowledge that are necessary for facing the challenges related to sustainability they will meet. Especially on goal 4 have higher education a role to play.

The Norwegian Government have committed to the Agenda 2030 and with that also made NTNU as a public institution responsible for contributing. NTNU shows that they are aware of their responsibility through their vision "knowledge for a better world" where NTNU writes that NTNU should be an active contributor to the global Agenda.

NTNU is following a trend with much focus on a sustainable campus and in research, and not so much focus on the education part. This is reflected in the students opinion where a large group responds that sustainability is only included in the curriculum in courses where it is the main topic or not at all. There is also a relationship between a high score in Sulitest and a large interest and involvement in sustainability work, which might reflect little focus on sustianbility in the curriculum.

The students have responded that Sulitest are useful and the student parliament at NTNU wants all students to get the possibility to take the test. For all students to take the test needs the Sulitest to be included in the curriculum at NTNU and to get a natural place where it belongs. EiT is an course that should learn students about interdisciplinary work that all 4$^{th}$ year students at NTNU have to take, this course can be a potential "home" for Sulitest. Another option is to make a thematic sustainability day for all students once a year like the University of Gothenburg where Sulitest is included.

Sulitest is a tool that can be used to include sustainability in the curriculum as a teaching tool with the resources linked to the questions with introduction to topics related to sustainability and the SDGs. It can also be used as a tool for mapping the student's awareness and to plan the content in the lectures from, and to map progress in a group from the first day on a program or a course to the last. It can also be used to compare with other courses or at a national, regional and global level.

Independently of where it ends up it needs teachers that are more involved in Sulitest than they are today. Teachers that give students the time in class to take the test and are using the resources in the test to teach or use the results to adjust the teaching and is willing to contribute to development of the test, especially the Norwegian module, which is ready for revision.

The Nordic sulitest project have ended, but there is more to do with development of Sulitest, including an upgrade of the national modules and to link them to the SDGs. A new Nordic Sulitest Project can benefit NTNU with networks, higher quality on the national module and better possibilities to compare on a regional level with Nordic modules that have a close relationship. A collaboration like this will also contribute to SDG4 and SDG17.

# Samandrag

Høgare utdanning har eit ansvar for å bidra til bærekraftig utvikling, spesielt gjennom utdanningsdelen av institusjonane. FNs bærekraftsmål og UNESCOs globale handlingsplan om utdanning for bærekraft gir begge retningslinjer til korleis utdanningssektoren kan bidra ved å sørgje for at alle elevar og studentar tileignar seg nødvendig kunnskap for å møte utfordringane relatert til ei bærekraftig utvikling. Høgare utdanning har ei særleg viktig rolle i bidra til bærekraftsmål nr 4.

Den norske regjeringa har forplikta Noreg til å bidra til Agenda 2030, og dermed er også NTNU som ein statleg institusjon forplikta til å arbeide for måla. Gjennom visjonen ”kunnskap for ei betre verd” viser NTNU at dei er klar over sitt ansvar og villig til å bidra aktivt til Agenda 2030.

NTNU fylgjer ein trend med meir fokus på bærekraft i campusforvaltning og forsking enn i utdanningsbiten av institusjonen. Denne trenden blir reflektert i studentane sine responsar i dette prosjektet der ei stor gruppe av studentane som har respondert har kryssa av for at det berre er bærekraft på læreplanen og i pensum i fag der bærekraft er hovudfokus, og også ei relativt stor gruppe meiner dei ikkje har bærekraft i det heile teke. Det er også ein samanheng mellom studentane si involvering i bærekraft, og høg poengsum i Sulitest som skal måle kunnskap om bærekraft, noko som kan være eit teikn på lite bærekraft i undervisning og pensum.

Dei aller fleste studentane meiner at det var nyttig å ta Sulitest, og Studenttinget har vedteke at dei ynskjer at alle studentar ved NTNU skal ta Sulitest. For å ha moglegheita til at alle studentar ved NTNU skal ta Sulitest må den inn i læreplanen og få ein plass der den naturleg passar inn og er tilgjengeleg for alle. EiT er eit emne som skal lære studentar om tverrfagleg arbeid og er obligatorisk for alle 4. årsstudentar og er dermed ein god kandidat. Alternativt kan ein lære av Gøteborgs Universitet og arrangere ein årleg tematisk bærekraftsdag der Sulitest er ein del av det faglege innhaldet.

Sulitest er eit verkty som kan brukast til å inkludere børekraft i undervisninga gjennom ressursane tilknytt spørsmåla i testen, men også til å kartlegge for å kunne tilpasse undervisning og til å måle nivået for å kunne samanlikne mellom ulike emne og på lokalt, regionalt og globalt nivå. Den kan også rukast til å måle framgang på ei gruppe eller eit emne over tid osb.

Uavhengig av korleis ein brukar Sulitest, og i kvar den plasserast er ein avhengig av lærarar som er meir involvert enn i dag. Ein treng lærarar som ikkje berre gjennomfører testen, men som aktivt brukar resultata og er villig til å bidra til utvikling av testen, særleg ei forbetring av den norske modulen som har eit stort behov for forbetring.

Det Nordiske Sulitestprosjektet er over, men det er framleis mykje som kan gjerast for å vidareutvikle Nordisk Sulitest, inkludert vidareutvikling av alle dei nasjonale modulane og kople dei til bærekraftsmåla. Eit nytt Nordisk Sulitestprosjekt kan være til stor fordel for NTNU med moglegheiter for eit sterkare samarbeid om implementering av bærekraft, høgare kvalitet på den norske modulen og ved at dei nordiske modulane blir utvikla etter same mønster kan det gi betre moglegheiter for samanlikning innan i Norden. Eit slikt samarbed vil også bidra til bærekftsmål nr 4 og 17.

# The UN Sustainable Development Goals

Goal 1. End poverty in all its forms everywhere

Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Goal 3. Ensure healthy lives and promote well-being for all at all ages

Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Goal 5. Achieve gender equality and empower all women and girls

Goal 6. Ensure availability and sustainable management of water and sanitation for all

Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all

Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Goal 10. Reduce inequality within and among countries

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

Goal 12. Ensure sustainable consumption and production patterns

Goal 13. Take urgent action to combat climate change and its impacts*

Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Goal 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

---

* Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change.

(United Nations, 2015)

# Contents

# 1 Introduction

Why should universities include sustainable development in the education at their universities? And why should they include the Sustainable Literacy Test in their lectures? This thesis will have a look into the responsibilities higher education have to contribute to sustainable development, and why education is a part of a university's activities where it should put an extra effort. It will highlight the responsibility of higher education to contribute to the global agenda, and looks on how other Nordic universities have been working to become more sustainable and the status of the Nordic Sulitest Project by the Nordic Sustainable Campus Initiative (NSCN) and possibilities to develop the use of the Sustianability Literacy Test (Sulitest) at the Norwegian University of Science and Technology (NTNU).

How are NTNU performing on sustainability in education today, are the students sustainability literate? Or is there need for improvement and can the Sulitest be a useful tool to do that? This study looks on how a group of the 4$^{th}$ year students, mainly students in the course EiT is performing on awareness of the United Nations (UN) Sustianable Development Goals (SDGs) and how sustainable literate they are compared with other students globally.

Another issue is how interested and involved the students are in sustainability, and how satisfied they are with their universities performance in sustainability in curriculum. And where in NTNU does Sulitest fit in and how can it be used?

## 1.1 Background

The Agenda 2030 has 17 sustainable development goals that the world is supposed to work against and reach by 2030 or before. To reach these goals partnership and contributions from public and private organizations are required.(United Nations, 2015) The goals are interconnected and cannot be fixed one by one like a checklist, but needs to bee seen together as one challenge. Higher Education has an important part to play with research and education, and to contribute to the goals. To face the challenges addressed by the goals it is necessary with wide interdisciplinary approaches, and partnerships that goes across traditional boundaries. "Higher education for sustainability must be transformative…it must work to challenge core assumptions and values students hold and that we as a society hold."(Howlett et al., 2016)

"Whereas in the late 1980s sustainable development was seen as matter of concern only to nations, there has been an increased awareness about the fact that it permeates all parts of our lives" (Filho, 2010). Higher Education Institutions (HEI) should take their part of the responsibility for contributing to sustainable development. "HEIs are siginificant stakeholders towards achieving the SDGs but are also case studies for understanding how other organisations can face the formidable challenges with integrating sustainability into their governance and operations."(Ferrer-Balas et al., 2008) Today many universities are doing well on the campus and research part, but not so good on education. (Koehn and Uitto, 2017)

A necessary pre-condition for achieving a sustainable future is "higher education curricula and pedagogical practices that foster interdisciplinary and creative ways of thinking about

human-environment interactions" (Howlett et al., 2016) and according to Wals (2010) "new, innovative educational approaches must facilitate genuine interdisciplinary thinking, and must be conducive to the cultivation of agency, self determination, critical thinking, a reflective capacity and the development of what might be called "a planetary consciousness"(Howlett et al., 2016). Attitudes towards environment can be linked to personal identity and is "changes in values, attitudes and behaviours are expected as outcomes of effective education for sustainability"(Diamond and Irwin, 2013)

There have been different approaches on how to teach students about sustainability and discussions about what that teaching should include. According to Karvinen et al the most commonly agreed competences are "systems thinking, integrative and holistic thinking, strategic and collaborative competences, whereas some of the most used teaching methods across disciplines include problem-based learning, case studies, group discussion and critical writing tasks." (Karvinen et al., 2017)

Sulitest is one of the most concrete actions for contributing to the Agenda 2030, and gives higher education a possibility to teach and measure their level and also the possibility to compare on both global and local level. In the Global Action Programme (GAP) on Education for Sustainable Development (ESD) by United Nations Educational, Scientific and Cultural Organization (UNESCO) one of the Priority Action Areas (PAAs) are to empowering youth with access to e-learning opportunities, the Sulitest can be seen as a contribution to this and is also an untraditional use of e-learning, which traditionally manly have been used "to provide flexible access to information, followed by support for communication and collaboration, and were less frequently used for the development of specific skills, personal identity and confidence."(Diamond and Irwin, 2013) On the other hand, is the research on the use of a test as a teaching tool very scarce. (Karvinen et al., 2017)

The goal of Sulitest is to develop sustainable literate students and – others. The Forum of the Future (2014) defines sustainability literacy as "having the skills, attitudes and attributions to take informed action for the benefit of oneself and others, now and into a long-term future."(Diamond and Irwin, 2013)

NTNU as Norway's largest University have a special position and possibilities to contribute, the questions discussed in this paper is about how and why they can contribute and improve their contributions to the agenda 2030 and the SDGs in the education part. The university is now following a trend in higher education in the Nordic countries and global with more focus on sustainability, and have also a goal that "all students that graduates from NTNU should have basic knowledge about sustainability"(HMS-avdelingen NTNU, 2017)

## 1.2 Issue

This study will look into how NTNU and universities in general can include sustainability in their curriculum and take responsibility and contribute to the Agenda 2030 through their education. How can universities better develop study programs and courses that make students acquire knowledge and competence about sustainability, and make graduates that are competent to contribute to sustainable development?

NTNU have included actively contributing to the SDGs in their vision and also have a goal about students knowledge of sustainable development in the environmental ambition. This

thesis will look on where Sulitest, an online learning tool can be used at NTNU to take responsibility for sustainable development, and to compare the performance in this field at a global, regional and local level so NTNU can measure their performance and how they contribute to the SDGs through the education part.

The study will focus on 3 issues/research questions:

1. Which responsibilities do NTNU have and how can NTNU take its responsibilities?
2. How NTNU is performing on Sustainability, especially in the education part?
3. How sustainability can be included in the curriculum at NTNU with the use of Sulitest.

# 2 Framework for sustainable development and higher education

Sustainability in higher education has gotten a larger place in the global agenda over the last years. In 1987 the report our common future was published, and the UN have had education as a priority area since the beginning, with the UNESCO established already in 1945, the same year as the UN itself.

With the UNs Decade for Education on Sustainable Development (DESD) and at the United Nations Conference on Sustainable Development in 2012 (Rio+20) sustainability and higher education got a new focus with the Higher Education Sustainability Initiative (HESI) that recognized the responsibility of HEI to contribute to sustainable development.

In the next 12 years should the world be working together to fulfil the Agenda 2030 of the UN and the agenda's Sustainable Development Goals. One of the most concrete action to contribute to this is the flagship of HESI; the Sustainability Literacy Test.

HEIs have followed a trend with more focus on becoming more sustainable in the last years, and different networks for sustainability in higher education like HESI and International Sustainable Campus Network (ISCN) have produced reports with the examples on best practices from different universities among the world so that others can learn from them and implement similar projects at other universities.

## 2.1 The 2030 Agenda and the UN Sustainable Development Goals

The 2030 Agenda is "a plan of action for people, planet and prosperity" (United Nations, 2015) and present 17 new goals and 169 targets for sustainable development that builds on the MDGs and fulfil them were the MDGs weren't good enough. The agenda pledge that "no one will be left behind" (United Nations, 2015) while they transform the world into a more sustainable one. The agenda aims to free the world from poverty, heal the planet and make it to a more peaceful place with greater freedoms.


**Figure 1: The UN Sustainable Development Goals**

The goals are universal and applicable for all countries, despite differences between them. They should be invisible integrated and balance all three dimensions of sustainability: Economic, social, and environment. They should stimulate action in the period from 1. January 2015 – 31. December 2030 "in areas of critical importance for humanity and the planet"(United Nations, 2015)

The development that have happened the last decades are under a large threat today, but at the same time now is the time to continue the work that has been done and create a more sustainable development in focus on five topics: People, Planet, Prosperity, Peace and Partnership. The new goals should make efforts where the MDGs failed. The SDGs is made over period that lasted for 2 years where the public was consulted and civil society and other stakeholders were engaged by the Open Working Group of the Grand Assembly on Sustainable Development Goals and the Secretary General of the UN. (United Nations, 2015)

The Agenda highlights the role of youth, and need for empowering them to create sustainable development. The vision of the Agenda includes "A world with equitable and universal access to quality education on all levels" and the new goals and agenda builds on shared principles and commitments of the UN like the Rio Declaration on Environment and Development and the principle of common but differentiated responsibilities.(United Nations, 2015)

All the goals are important for education in different ways, but especially goal 4 with target 4.3, target 4.7 and target 4.c has a large role to play for higher education. All the goals are

closely interlinked and goal 4 plays a crucial role in supporting the integration of the others. Together with target 9.5 and goal 13 with target 13.3 these are some of the most important for higher education and ESD.

> *"Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all"(United Nations, 2015)*
>
> *"Target 4.3: By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university"(United Nations, 2015)*
>
> *"Target 4.7: By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including among others through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of culture of peace and non-violence, global citizenship and appreciation of cultural diversity and/or cultures contribution to sustainable development"(United Nations, 2015)*
>
> *"Target 4.c: By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island countries."(United Nations, 2015)*
>
> *"Target 9.5: Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending." (United Nations, 2015)*
>
> *"Goal 13: Take urgent action to combat climate change and it's impacts"(United Nations, 2015)*
>
> *"Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaption, impact reduction and early warning. " (United Nations, 2015)*

Representatives from governments, intergovernmental organizations, UN entities, and civil organisations meet each year in the UN HQ in New York at the UN HLPF to review the global progress of the Agenda 2030. (Zhu, 2017)

The SDGs are divided into 4 main themes that will be in focus in the UN HLPF until 2020:

- HLPF2017: Eradicating poverty and promoting prosperity in a changing world: SDG1, SDG2, SDG3, SDG5, SDG9, SDG14
- HLPF2018: Transformation towards sustainable and resilient societies: SDG6, SDG7, SDG11, SDG12, SDG15
- HLPF2019: Empowering people and ensuring inclusiveness and equality: SDG4, SDG8, SDG10, SDG13, SDG16
- SDG17 Partnerships for the Goals, as this goal is by nature transversal and highly connected to all the other goals. (Carteron and Decamps, 2017)

## 2.2 Norwegian government on education and sustainability

The Norwegian government have decided to follow up the SDGs through the annual work with the national budget. The Ministrys have responsibilities for different SDGs,

and the ministry of finance sums it all up in the National budget. The Ministry of Education and Research are responsible for SDG4. In their preposition to the budget for 2018 they doesn't mention sustainability in the curriculum in higher education at all. In their contribution to the budget are the Ministry for Education and Research focusing on improving the quality in teacher education, and raise the quality level of teachers in general. (The Royal Norwegian Ministry of Finance, 2017, The Royal Norwegian Ministry for Education and Research, 2017b)

In the white paper: "kultur for kvalitet i høyere utdanning" writes the Norwegian ministry for research and education that "the education must contribute to development of skills and attitudes that makes student capable to contribute to a sustainable development, and to become global citizens"(2017a) and that higher education in Norway has a central role to play in the follow up of Agenda 2030 in Norway" (the Royal Norwegian Ministry for Education and Research, 2017a) with the follow up of goal 4, and that higher education also are important for the achievement of the other 16 SDGs. The Norwegian government also follows the recommendation from the Council of Europe's Committee of Ministers to it's member states on the public responsibility for higher education and research: "public authorities should ensure that higher education institutions, while exercising their autonomy, can meet society's multiple expectations and fulfil their various and equally important objectives, which include: preparation for sustainable employment."(2007)

### 2.2.1 ISO 26000:2010 Framework for Social Responsibility

Social responsibility can be defined as "A way of summing up the broader expectations of society that need to be taken into account by organizations seeking to act responsible… An overarching objective of an organizations social responsibility should be to contribute to sustainable development"(The International Organization for Standardisation, 2010) In this the organization have a responsibility to contribute to sustainable development in all three dimensions: Economic, social and environmental. Sustainable development is a widely accepted concept from the Brundtland report "Our Common Future" (1987) about how to meet the needs of society without destroying the resources for the next generation.

The decisions and activities of an organization can contribute to sustainable development on local, regional and a global level. It has responsibilities for "the impacts of descisions and activities over which it has formal and/or de facto control." (The International Organization for Standardisation, 2010) The responsibilities may in some situations also have influence on the decisions taken by other organisations, and will therefore in those situations fall under the organisations sphere of influence.

ISO26000:2010 is an international standard that provides guidelines on how to behave social responsible and include stakeholders in the activities and decision of an organization. The standard includes 7 principles of social responsibility which is shown in figure 2, and should be applicable to all organizations independent of size and type of organization. An organization that is social responsible should take all the 7 subjects into consideration in their decision making process.

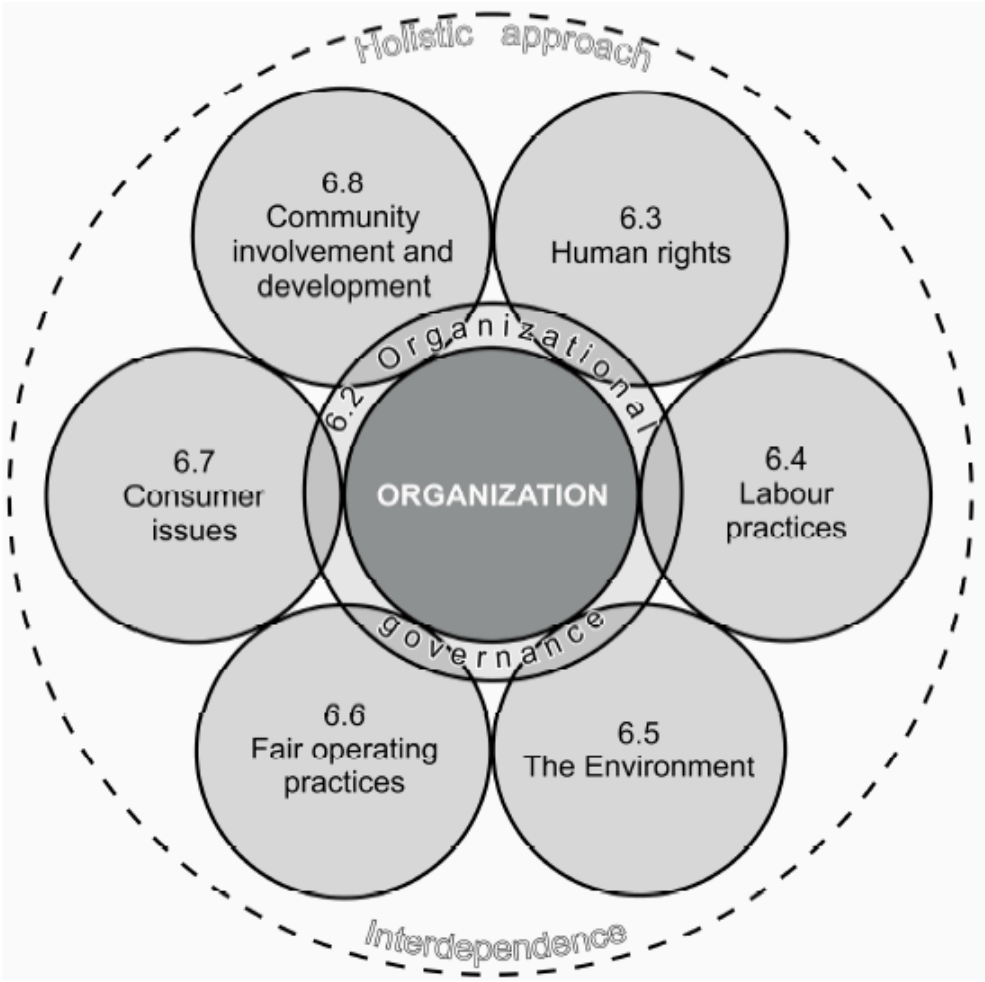


**Figure 2: The seven core subjects of social responsibility (source:(The International Organization for Standardisation, 2010)**

The standard is developed for the use of organizations, but can also be used by government institutions. The state have a much larger responsibility for the different aspects of social responsibility and sustainable development through law, and the standard does not include guidance on what should be legally binding. But the standard can give guidelines for all organizations, like NTNU that is an independent institution, owned by the government. As seen in figure 2 is there several different dimensions that must be included in the operations of a sustainable responsible organization, including human rights, the environment and the expectations from the community

## 2.3 UNESCO Global Action Programme on Education for Sustainable development

The UN DESD was launched in 2005 and have set a new focus on sustainability in education and generated many new intergovernmental agreements. The GAP is a follow up on this work and the outcome of the Rio+20 conference, where the international community agreed to "promote education for sustainable development more actively into education beyond the UN Decade of education for sustainable development"(United Nations, 2012)

The GAP has a goal to achieve the vision put forward by the DESD "A world where everybody has the opportunity to benefit from education and learn the values, behaviour and lifestyles required for a sustainable future and for positive societal transformation"(UNESCO, 2014)

The gap will use a two fold approach with getting sustainable development into education and getting education integrated in sustainable development to reach the overachieving goal "To generate and scale up action in all levels and areas of education and learning to accelerate progress towards sustainable development" (UNESCO, 2013)

To reach this goal the UNESCO roadmap is focusing on 5 Priority Action Areas (PAA)

1. *Advancing Policy*
2. *Transforming learning and training environments*
3. *Building capacities at educators and trainers*
4. *Empowering and mobilizing youth*
5. *Accelerating sustainable solutions at local level*

It has been identified actions, made expectations for the outcome and important stakeholders have been identified for each of the PAAs, which have one goal each. The UNESCO have set up appropriate ESD coordination mechanisms and is using the already existing UNESCO network and UN agencies and partners to monitor and evaluate the GAP in both quantitative and qualitative ways. HEI have a key role to play in all the 5 PAAs. (UNESCO, 2014)

The GAP cuts across different concerns in both sustainable development and education and stakeholders are encouraged to include it in already existing mechanisms. For each of the PAA it has been made partner networks for the most important stakeholders to meet and share ideas. (UNESCO, 2014)

All stakeholders of the GAP are encouraged to use their fully potential in a systemically way to contribute to the PAAs and institutions should "promote whole-institutions approaches to ESD at all levels and in all settings" (2013) and to "Strengthen the capacity of educators, trainers and other change agents to become learning facilitators for ESD." (2013)

The GAP calls for action at global, regional and local level. In PAA 5 Accelerating sustainable solutions at local level, stakeholders are encouraged to contribute in "the search for sustainable development solutions at a local level through ESD"(UNESCO, 2013). Here multi-stakeholder dialogue and co-operation between government, education and research institutions and other parts of the local community has an important role to play. (UNESCO, 2014)

The youth are the generation that will take the consequences of the actions and decisions made today and in the past. But it is also the generation that has the potential to propel sustainable development widely. To do this, the youth to be empowered with knowledge, technology and networks and access to decision making so they can contribute to shaping their own future in the framework of ESD. (UNESCO, 2014)

Here it is necessary to give them access to information and knowledge, and e-learning opportunities is one of the tools mentioned in the UNESCO Roadmap.

## 2.4 Higher Education Sustainability Initiative

HESI is a partnership launched in 2012 between UN Department of Economic and Social Affairs (UN-DESA), UNESCO, UN Environment, the Principles for Responsible Management Education (PRME)-inititative, United Nations University (UNU), United Nations Human Settlement Programme (UN-HABITAT) and United Nations Conference on Trade and Development (UNCTAD). The initiative was launched in the run-up to the Rio+20 conference.

The institutions that make voluntary commitments to HESI commits to:

> *"1. Teach sustainable development across all disciplines of study*
> *2. Encourage research and dissemination of sustainable development knowledge*
> *3. Green campuses and support local sustainability efforts, and*
> *4. Engage and share information with international networks"*

Over 300 institutions worldwide have committed to the HESI, among them several universities from Finland and Sweden. The University of Oslo (UiO) is the only Norwegian University that have committed to the HESI.

"HESI provides higher education institutions with a unique interface between higher education, science, and policy making. " The HESI makes reports on progress in areas of importance for their field and arranges conferences and other meeting places for the institutions committed to the initiative. In 2017 they made an event "Higher Education Institutions – Key Drivers of the Sustainable Development Goals" during the UN High Level Political Forum (HLPF). In 2018 there will be a new HESI event during the HLPF. Other focus areas in 2018 will among others be to develop an online platform of best practices/partnerships of HESI-members, a "HESI SDG Action" with the best practises on the goals that are in focus on the 2018 HLPF, and to make a library with the best practises and resources on integration of SDG into curriculum at HEIs.(HESI, 2017)

In October 2015 HESI in close relationship with Kedge Business School held an event at the UNESCO HQ "From Rio to Paris: Higher Education for Climate Change Action" and here the report "Climate change action for sustainable development: In support of sustainable development goal 13: Take urgent action to combat climate change and its impacts" was launched, as a contribution to the Conference of the Partners (COP21) of the United Nations Framework Convention on Climate Change (UNFCCC) that was in Paris two months later. It was sent with an open letter from a global alliance of tertiary and higher education sustainability networks, among them the NSCN. The networks included over 3000 universities worldwide. The open letter was "urging the Ministers and governments to acknowledge and strengthen the research and education role that universities and colleges play in addressing climate change."(United Nations Division of Economic and Social Affaris: Division for Sustianable Development, 2015)

The report made by UN DESA with contributions from other partners of the HESI highlights actions taken by institutions that supports the HESI that contributes to SDG 13. Here it goes into what each one of them has done in the university to contribute to the SDG. Among the contributors is Kedge Business School in France, where Sulitest is highlighted as a large contributor at the school and also that they have the largest sustainability department in France.

## 2.5 Other Nordic universities and sustainability approaches

The Nordic universities are well known for doing well on sustainability, but unfortunately they are following the trend with more focus on creating sustainable campuses than on sustainability in the curricula. (Karvinen et al., 2017) At the same time much is going on, and also the Nordic universities have projects on how to be more sustainable that are presented by HESI and ISCN as examples on the best practices that others can learn from.

The NSCN, which organizes 45 nordic universities and strengthen already excisting sustainability work at the Universities and helps with funding from Rio+20 projects and other external funding's. The Nordic Council of Ministers funds the NSCN. In 2015-2016 NSCN organized a Nordic Sulitest project where national modules where developed, and a pilot phase for Sulitest was launched at several universities among them NTNU.(NSCN - Nordic Sustainable Campus Network, 2018, NSCN - Nordic Sustainable Campus Network, 2016)

The **University of Gothenburg (GU) in Sweden** is working on cutting their climate footprint with focus on Environmental Management Systems (EMS). (United Nations Division of Economic and Social Affaris: Division for Sustianable Development, 2015) The University is also working on a whole institution approach to include sustainability and have focus on Educating for Sustainability. Their EMS includes an action plan, where "the university shall increase the integration of sustainable development in education."(ISCN Secretariat, 2017)

The University is operating the Centre for Environment and Sustainability (GMV) together with Chalmers in Gothenburg. This centre is an important player for the sustainability work at the universities and is host for the Sustainable Development Solutions Network Nothern Europe (SDSN-NE), which is closely linked to the UN and "brings together the knowledge, experience and capacity in academia, business and civil society, and strive to promote development in Northern Europe, as well ad the region's efforts towards sustainable development worldwide."(ISCN Secretariat, 2017)

Other projects at the university is a cooperation between the Academy of Music and Drama at the University and El Sistema on "the music as a tool for social development"(ISCN Secretariat, 2017). They have also worked together with establishing the Dream Orchestra for unaccompanied refugees. The Academy of Music and Drama has also other projects on sustainability and in 2017 they hosted a conference on sustainability with over 350 participants from 55 countries. (ISCN Secretariat, 2017)

GU is now labelling all their courses and study programs to highlight those who deal with sustainability issues. On their website you can now chose to search for courses with sustainability in, in the same way that you choose discipline and part-time or full time etc. (Universitet, 2018) They now have 67 that are sustainability focused and 503 that are related to sustainability. They have made a new post-graduate program on Sustainability Opportunities, and have several educational programs that are relevant for sustainable development, among them an interdisciplinary master's program in global health. This program involves teachers from 4 departments, and students with different backgrounds and 9 different nationalities. The program deals with global health issues, and has its strength in the varied backgrounds of the participants. (ISCN Secretariat, 2017)

Together with the Centre for Environment and Sustainability (GMV) the faculties at GU have developed toolboxes for implementing sustainable development in first cycle courses and study-programs. The teachers get the opportunities to try out these under supervision, giving feedback and discussing with colleagues from both their own discipline and other disciplines. The faculties at GU also have their own project on integrating sustainability in education, for example The Gothenburg Centre for Marine Research offers an interdisciplinary graduate school in marine interdisciplinary research. Here doctoral degree students and their supervisors work together in interdisciplinary projects to promote sustainable management of marine resources. (ISCN Secretariat, 2017)

The School of Economic, Business and Law (GU) have a project with a mandatory annual student day on sustainability with different focus area for each year in the Bachelor programmes. According to environmental coordinator Mattias Sundemo Sulitest is included in the Sustainability day in the 1st and 6th semester.

The students at GU have gotten their own Student Sustainability Office, and students at the university have been working together with the GMV and others to arrange sustainability days with panel debates, workshops etc with foucs on how to act sustainable. (ISCN Secretariat, 2017)

**Chalmers University of Technology** is working with a challenge lab that "aspires to operate across sectorial boundaries and builds capacity to deal with more than one issue at a time" (ISCN Secretariat, 2017). The work across boundaries will give the students a relevant education for the future and "enable them to make a meaningful contribution to a more sustainable future society" (ISCN Secretariat, 2017). The staffs are multi-disciplinarian and their job is to guide the students in the lab in their own project, where the students have the leadership. The student's research projects in the challenge lab are focusing on questions with a sustainability driven approach.

At Chalmers there is a long tradition for engaging in societal challenges, and the lab goes into this tradition. "The purpose of the Challenge Lab is to: Strengthen the educational dimension in the "education-research-outreach" triangle; become an important hub for actors from academia; the public- and the private sector to gather around the students; build trust among stakeholders; give students the opportunity to develop unique capabilities in working across disciplines with a sustainability-driven approach." (ISCN Secretariat, 2017)

The Lab offers a preparatory course and is providing the opportunity for all master students to write their thesis there. Master students at the Challenge Lab can work together with actors related to the five regional knowledge clusters in western Sweden on complex societal sustainability challenges. The students get the opportunity to work interdisciplinary within and between the clusters on different challenge-driven entities. In their work at the Challenge Lab the students should build capacities, learn to gain the trust from stakeholders, apply relevant sustainability frameworks and system perspective to meet sustainability challenges, among other skills necessary for working with sustainability transitions and creating sustainable development.

**KTH – Royal Institute of Technology** has been working since 2011 on the whole institution to make sure that sustainability is integrated in all engineering and architect programs. To achieve this they have two focus areas: A support program for directors and teaching staff, and evaluation of the programs' efforts.

In the support program teachers get access to a web-based toolbox, a pedagogical course on learning for sustainable development, course modules that can be integrated, seminars and networking, coaching and seed funding for developing new courses and other activities.

The learning outcomes related to Sustainable Development was first set by the Swedish Higher Education Ordinance and then developed further and clarified at the university by the program directors.

The first step of the evaluaton process was a self-evaluating in 2012 where the program directors described "the programs' learning outcomes related to ESD, which courses support the learning outcomes of the programs, examples of examination, the level of progression etc."(ISCN Secretariat, 2017) They also specified the need of further support.

The self-evaluating report was then used as the basis for a dialogue meeting where the outcome was an action programme for integration of ESD in educational programs from 2013 to 2015. In 2015 they had a four steps follow-up with a survey in the engineering and architecture programs, evaluation of the survey, interviews with programme directors and then all information was summarised into a report. The process will then continue based on the information in the report. All programs have now developed new action programs for ESD that will be implemented in the EMS.

There is now no programme at KTH that completely lacks integration of sustainable development, but some of them are in the process of reconstruction where sustainable development will be integrated as a larger part.

The success of this project was the support from the leaders of the university. "The support from the leaders of the university is also of high importance if changes are to be realized on the school levels."(ISCN Secretariat, 2017)

## 2.6 SULITEST

The Sustainability Literacy Test (Sulitest) is a result of the Rio+20 conference where higher education became more aware of their responsibilities for contributing to sustainable development. The Sulitest was developed as a response on HEIs need for a tool to measure how they performed on sustainability in education and monitor their impact. (Décamps et al., 2017) Sulitest is one of the 17 featured initiatives of UN partnership for the goals and a official partner of the GAP. (Sulitest.org, 2016b) "The test aims to facilitate higher education teachers to assess their students' knowledge and skills on sustainability and works as a means for testing participants' sustainability awareness."(Karvinen et al., 2017) It is built on an idea that "for a sustainable future, we need a world full of people with sustainability awareness and core literacy."(Décamps et al., 2017)

The idea behind Sulitest is that "for a sustainable future we need a world full of people with sustainability awareness and core literacy."(Décamps et al., 2017) The Sulitest is an online training and assessment tool. It is developed in the context of ESD after the principles of PRME. The goal is to make graduate candidates that have the sufficient knowledge and skills to face the global challenges. In the future it might be a demand from employers that

candidates can document that they have a basic knowledge of sustainability practises. Here the Sulitest comes in with a international test that is based on scientific criteria's and can give the Students a score and proof of their sustainability literacy, a phenomena that describes not only their knowledge but also skills and mind-set that are necessary for good sustainability practices. The test is available for both academia and other institutions. (Décamps et al., 2017, Carteron and Decamps, 2017)

The core mission of the Sulitest Association is "to provide and develop a tool to make sure that current and future decision makers have sufficient awareness on sustainability challenges to take informed and effective decisions and to collectively build a sustainable future"(Carteron and Decamps, 2017).

The Sulitest is built up as an online multiple-choice questionnaire. All students has to take the international core module at least once, and then the examiner can build up the test with adding extra module like a specialised module with regional or national questions and customized modules that are created specifically by & for an organization/sector. All questions in the core module are "based on verified and reputed sources that are subject to a broad consensus in the community of researchers and practitioners in the field."(Carteron and Decamps, 2017)

The Sulitest is built up to cover 4 dimensions from the boarder to the individual perspective:

- *Sustainable humanity and ecosystems on Planet Earth,*
- *Global and local human constructed systems to answer people's needs,*
- *Transition towards sustainability,*
- *The roles we have to play to create and maintain individual and systemic changes*

*(Carteron and Decamps, 2017)*

PRME and ESD is together with the Agenda 2030 the main framework for the development of Sulitest, which builds on the values of UNESCO. The specialized modules are developed and validated by a regional or national expert committee wile the core module has Senior Advisory board with members from different UN agencies and international organizations that validates the questions and evolutions on the tool. The questions in the sessions are chosen after a matrix that makes sure that all dimensions are covered. (Carteron and Decamps, 2017) The questions in a Sulitest session should test the students Knowledge, skills and mindset. Figure 3 shows how the test is built up with 15 subjects on knowledge, 9 on skills and 6 on mindset and the themes in each of the categories. The questions have 4 alternatives and "I'm not sure". There is one correct answer that gives 4 points, and three not correct answers that don't give any points. The students get 1 point for choosing "I'm not sure"

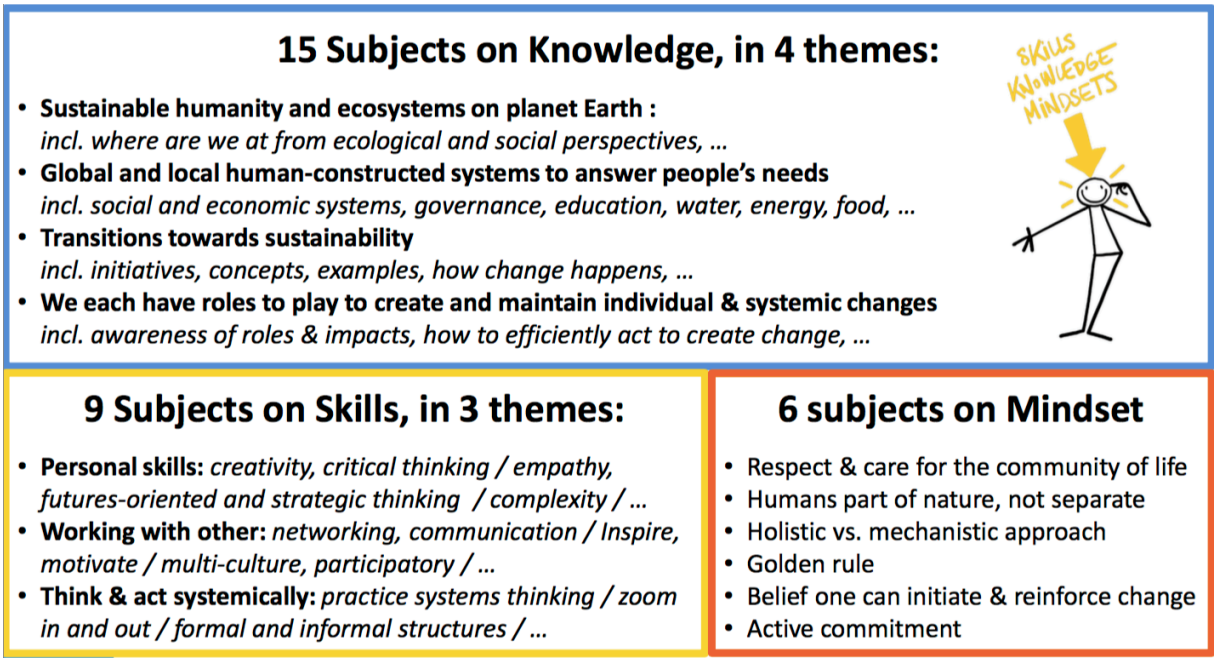


**Figure 3: The themes in Sulitest (Sulitest.org, 2016a)**

A normal Sulitest session is built up of the international module with 30 questions and a regional/national module with 25 questions and, at the end of each session the student gets the possibility to respond to an international survey from the Sulitest organization about their background and interest in sustainability. The examiner (teacher) can choose wheter the session is anonymous or not. It takes approximately one minute per question. The normal time to perform a session with these two modules and the international survey is 60 minutes, including time to read the information after each question. This can be a little bit heavy, and therefore Sulitest have now developed a short version; the Suliquiz with ten questions where the students friendly compete in teams. (Sulitest.org, 2016a)

The Sulitest has been the flagship initiative of HESI, and is one of the most concrete actions after Rio+20. Sulitest "provides useful information on trends and knowledge gaps related to the SDGs"(HESI, 2017) . The Sulitest has in cooperation with UN-DESA developed a module to be used for training and assessment on the SDGs framework. In 2018 the HESI and Sulitest will work together to develop a module to the test for each of the SDGs. (HESI, 2017)

"Sulitest has become an active contributor to the 2030 Agenda"(Carteron and Decamps, 2017) and the Sulitest reported to the UN HLPF in 2017 and will do the same in 2018. (HESI, 2017)

In May 2018 Sulitest held their first Global Assembly with over 30 stakeholders from universities that use Sulitest or is about to start using Sulitest, companies, organizations and other stakeholders.

According to Anja Stoll, Head of Community and Content Development, Sulitest is going through a growing period that is becoming more and more challenging to manage. Therefore, there will be changes in Sulitest and the community. The Global Assembly came up with ideas for 10 priority projects where stakeholders are invited to contribute. 4 of them will be tackled immediately; others will follow once those are on track. Each of the priority projects will get a chairman on annual basis. Among the priority areas are "to create active exchange of tools for use and tools for implementation so users can better understand how to use

Sulitest and why and where it is of value" (Sulitest, 2018) Other priority projects are to make the test more robust by providing some analysis of the results from Sulitest, and make recommendations on the content before the Sulitest grows further. It will also be focused on the development of a new version of the platform to improve user experiences and the development of new additional specific modules.

# 3 Methods

Research design is “A framework for the generation of evidence that is suited both to a certain set of criteria and to the research question in which the investigator is interested” and “research methods can be and are associated with different kinds of research design” (Bryman, 2012)

This study is a case study are triangulation used to enlighten a case from so many angles as possible. Methods from both quantitative and qualitative data have been mixed, with the purpose to study the case from as many different angles as possible.

“Qualitative research is a process, which has been divided into 6 steps (with 2 substeps). The first step is to make a general research question, and then after collection and interpretation of data it is possible to make a tighter specification of research data, go back and collect more data, eventually again tighten the research question and then at the end write up the findings and make a conclusion.” (Foster, 1995, Quoted in Bryman, 2012). The research questions for this study that can be found in chapter 1.2 have followed a process similar to this one.

## 3.1 Case study

A case study describes one single case. This study has been performed as a case study focusing on Sulitest at NTNU as the case. The purpose of case studies is to tell as much as possible about one single case, not that the results should necessarily be transferable to other cases. (Bryman, 2012) In case studies it is common to use a multi-method approach and “Theory is supposed to be an outcome of an investigation rather than something that precedes it.” (Bryman, 2012)

The study is unlike many other case studies performed over a short period of time. This is because of the limited time available for a master thesis, the results would probably have been different with a larger time frame, or performed at another time or institution. It is not possible to do statistical generalizations from it, but the analytical generalizations should be valid and possible to transfer to other times and places.

### 3.1.1 Exploratory case

In an exploratory case study a distinct phenomena with a lack of detailed preliminary research. There is very little literature with research on the Sulitest available and therefore an exploratory design has been chosen for this study because of the lack of other studies on Sulitest to build it on. The sulitest is a realively new field of research and there isn’t enough data available to make hypothetical formulations. In exploratory case studies there is a “high degree of flexibility and independence on with regard to the research design as well as the data collection.” (Mills et al., 2012)

## 3.2 Data collection

The methods to collect data in this study have been varied, and not all of them so traditional. Some of the data and or/methods have been chosen because of time frame or because of problems with getting access to better alternatives. In total the data's collected will fulfil each other to give an overview of the current situation on sustainability of education at NTNU today, and give answers to the questions raised in the issue about NTNUs performance on sustainability and how to improve with using Sulitest.

It has been used different approaches to get information from different groups of respondents and informants. For the students there have been a test and a survey to get qualitative data, from the teachers a qualitative survey with open questions distributed over e-mail. Much information has been collected from strategies, web pages and reports. When there have been a lack of written information have information been collected through meetings, interviews and e-mail communication with experts, stakeholders and those who are working with Sulitest or using it in their work.

### 3.2.1 Structured survey – Students

All students that have taken the Sulitest has been offered the possibility to take an international survey from the Sulitest organization at the end of the test. I have used the responses from 8 classes in the project. The reason that not all classes weren't included was because of limited time where they did take the test to late in the semester or because of to few respondents. In total 107 responses was used for this part of the studies. This survey have been a structured quantitative survey.

### 3.2.2 Unstructured survey – Teaching staff and other user of Sulitest

A simple qualitative survey with a few semi-structured questions with open end has been sent out on e-mail to the teachers responsible for the Experts in Teams (EiT)-villages where the test has been performed this spring. The answers here have been made anonymous with a scrambling key. Because of few responses it has been analysed together with other feedbacks from the teaching staff during the project. These questions can be found in the appendix.

The approach with a few open-ended questions have also been sent out to the focal points for Sulitest at other Nordic Sulitest. Here it was only two responses, they have been included in the mapping of activity in the Nordic Sulitest. The questions can be found in the appendix.

### 3.2.3 Documents - Stakeholders and decision makers

> "*Stakeholders are organizations or individuals that have one or more interests in any decisions or activity of an organization… …The relationship needs not to be formal. The relationship created by this interests exists whether or not the parties are aware of it."* (The International Organization for Standardisation, 2010)

NTNU is a large organisation with different stakeholders. The performance of NTNU in Sustainability affects its stakeholders. Stakeholders have large influence, and can affect how successful a project like Sulitest can be. To identify a few important stakeholders I have used the questions from ISO 2600: 2010 p.17-18.

- *To whom does the organization have legal obligations?*
- *Who might be positively or negatively affected by the organization's decisions or activities?*
- *Who is likely to express concerns about the decisions and activities of the organization?*
- *Who has been involved in the past when similar concerns needed to be addressed?*
- *Who can help the organization address specific impacts?*
- *Who can affect the organization's ability to meet its responsibilities?*
- *Who would be disadvantaged if excluded from the engagement?*
- *Who in the values chain is affected?*

### 3.2.4 Interviews

I have searched for documents and other written information about the stakeholders opinion about Sulitest, sustainability in education etc. and analysed the text for information about their opinion, politics etc. Where the information has been inadequate I have contacted the organizations and their representatives for more. Here it have been used both formal contact like e-mail and more informal like social medias. There have not been so many personal meetings because of limited time and large distances.

The interviews have been as open as possible, with only a topic and maybe one or two questions from the interviewer, a qualitative method to get as much information as possible from an expert about a theme. An unstructured interview "gives insight in what the interviewee sees as relevant and important"(Bryman, 2012)

## 3.3 Literature search and reviews

A litterate rewiev is a way to map the current research in the field, and what to build your research on. (Bryman, 2012) The Sulitest is a relatively new field and it isn't done much research on it so far. Therefore it have only been performed descriptive reviews of the available literature.

The Sulitest is a relative new phenomenon and it hasn't been done much research on it yet, and the access to literature is limited. A systematic literature search have been performed with searching for the same keywords in Oria, Scopus, E Sage Journals, and other databases NTNU have access to. These databases have the benefit that they are peer reviewed. I have also done simple searches in Google scholar, a search platform that aren't peer reviewed.

The complete list of literature used for this study can be found in the literature list. Since there was so few results on "Sulitest" the search have been repeated several times during the research period to look for new studies. The results from the strategic literature search can be seen in chapter 5. I have read the abstract of the ten first results in all the search combinations in Oria and the scientific databases and looked over the first page in Google Scholar. The challenge with some of the search combinations, and Google Scholar is that they don't limit enough and ends up with over a thousand results.

To find more relevant literature I have looked for articles where the article "Sulitest: A collaborate initiative to support and assess sustainability literacy in higher education"(Décamps et al., 2017) has been sited and documents and papers that are sited in this article. In June 2018 this article is sited in one other article: An article about new rating system for existing green schools in Iran. Unfortunately this article wasn't relevant for this study. In Google scholar I found one article that might be relevant, about the results from Sulitest in Brazil including the results of the survey. Unfortunately this was not published in open access or in a journal that NTNU have access to. Because of the limited resource it wasn't a priority to pay for access to this article.

## 3.4 Ethics

To do research with participants it is necessary to gain the trust of the informants to get information that is as good as possible.
There is 4 important ethical principles for social studies according to Bryman (2012):

- *"Whether there is harm to the participants?*
- *Whether there is a lack of informed consent?*
- *Wheter there is an invasion of privacy?*
- *Wheter deception is involved?"*

An issue is that to take the test the students have to register and make a user profile on the website of Sulitest. Here they have to register with names and e-mail addresses, in this study some students have used an acronym when they registered. Before the session starts the student will get information wheter the session is anonymous or not. There is an issue that an examiner also get a list of names on the students that have registered for the test and can see who has completed and who hasn't. Only the student will get access to his or her results in an anonymous session. The examiner will only get the results for the group as a whole. If only one student complete the test it wouldn't be anonymous. The smallest group that have participated in this project are only 4 students, which makes the anonymity weak. The list of names on the students has not been shared with the teachers, and haven't been used for the study.

Sulitest is a French non-profitt organization and the test is registered with the French governmental organization for data and research security. No personal data from Sulitest will be used without authorization of the owner of the data. "Data shared with researchers will be systematically ourged so that organizational an individual identities are protected and kept confidential." (Sulitest.org, 2016a)

To participate in research should always involve informed consent. All students have been given oral information about the test, and my project before the test starts. In the website there have been more information about Sulitest, and they have accepted the terms of Sulitest when

they register for the test. In the beginning of all test session there is a page with information about the test, what the information will be used for and that it is voluntarily to participate, and that it is possible to withdraw at any moment, their responses wont be saved before they have completed all modules.

One concern is that my gatekeepers have been the teachers responsible for the test, and even though I have informed the students that it is voluntarily to participate, some teachers have chosen to inform their students that they want all to participate and some have even said it is mandatory. The anonymity in the test results, and not sharing list of which students that have participated have made it impossible for the teachers to make it mandatory, but the pressure might have made students that was unsure about participating, participate.

The participation have been a little bit higher in classes with pressure from teachers to take the test. Approximately half of the students have taken the survey. The data from the survey and the results from the test have been used for this study, and will be used by the Sulitest organization.

All data from Sulitest used for this study have been completely anonymous, and in the study it is not possible to connect respondents to their responses.

The study has been registered at the Norwegian Centre for Research Data (NSD) because of the collection of e-mail addresses and responses that can be sensitive. In the study I have followed their recommendations for storage and collection of data. All data that can be possible to use to identify respondents will be deleted at the end of the project.

I've met some ethical challenges on my way. I've tried to be so objective as possible during the process and in my meeting with peoples. I ended up with a dilemma when a stakeholder that didn't now too much about the Sulitest asked me "what do you think?" and "what do you need me to say?" Here I could have used the possibility to get the perfect answer for the thesis, and making the stakeholder's opinion so close to mine as possible. I ended up wit trying to be as objective as possible when I described the possibilities and both positive and negative sides with the use of Sulitest so far, focused on that I had been working with it a while and that I probably was influenced by that and that what I needed was her opinion. In the end I got a useful response with her thoughts instead of

# 4 Sulitest at NTNU

NTNU is Norway's largest University with 40181 students in 2017. That year 7210 students graduated from NTNU. The university has the main responsibility for technology in higher education in Norway, and approximately 75% of the students in Norway taking a master degree in technology studies at NTNU. NTNU also have the largest teaching education in Norway with approximately 4000 students. (NTNU, 2018a, NTNU, 2018c)

Sulitest was started up at NTNU in 2016 as part of the Nordic Sulitest Project, and has been growing since then, with almost 400 registered candidates per June 2018. Not all of these students have completed a test, others have taken it two times. In June 2018 have 307 candidates completed the Sulitest at NTNU. One challenge is that NTNU is registered as an organization 2 times, and the student parliament at NTNU is also registered as a user organization. Because of no access to datas from these two "organizations" I only include data collected from the registration of NTNU as "Norwegian university of Science and Technology" with John E. Hermansen as focal point, and not "NTNU" – Eivind Kjosnes" or the "Student Parliament at NTNU".

Table 1 shows the average score of students at NTNU that have taken the test in the spring 2018 divided by course. Only three of the classes that have taken the test in the spring 2018 are above the average on SPEC Norway. In the international module is the average score for Norwegian students 58% while the international average is on 54%. TIØ4850 and BI207 are the only groups in this sample that is beyond the international average. Most of the others are between the international average and the Norwegian average except from BI2098 with 59% and TIØ4261 and BI2098 that has 66%. TIØ4261 is the only group that have taken the test two times. They did take it in January at the beginning of the term, and again in April at the end of the term. As we can see from table 1 this class had a lower score on the international module in April than in January. On the other side they had a large improvement on the Norwegian module from 34% to 43%. An important factor that probably is affecting the results here is that in January did 34 students complete the test; in April was it only 20. This is a weakness to the potential to measure progress in the class over time.

From figure 4 and figure 5 can it be seen how the classes have scored in the CORE international module and the SPEC Norway module. In the international module there is no one that stands out, TPD4850 might be the one with the largest difference with approximately 75% in "role to play, individual & systemic change" and only 40% in "global and local human constructed system". In the Norwegian part the variances are larger, and especially on "Global and local human constructed system where most of the groups is between 30%-50% do TPD4850 have over 80%. On "role to play, individual and & systemic change" has TIØ4853 only around 10% while BI2098 has around 70%. There is no pattern that shows differences or correlation between the different departments that have participated in the study.

**Table 1: Average score on modules**

| Course code | CORE international | SPEC Norway |
|---|---|---|
| **International** | **54%** | **X** |
| **Norwegian** | **58%** | **39%** |
| **AAR4914** | 47% | 31% |
| **AAR4922** | 54% | 27% |
| **BI2097** | 52% | 39% |
| **BI2098** | 66% | 41% |
| **TBA4861** | 59% | 40% |
| **TIØ4261 – jan** | 66% | 34% |
| **TIØ4261-apr** | 65% | 43% |
| **TIØ4850** | 43% | 35% |
| **TIØ4853** | 58% | 35% |
| **TIØ4855** | 57% | X |
| **TPD4850** | 54% | 39% |

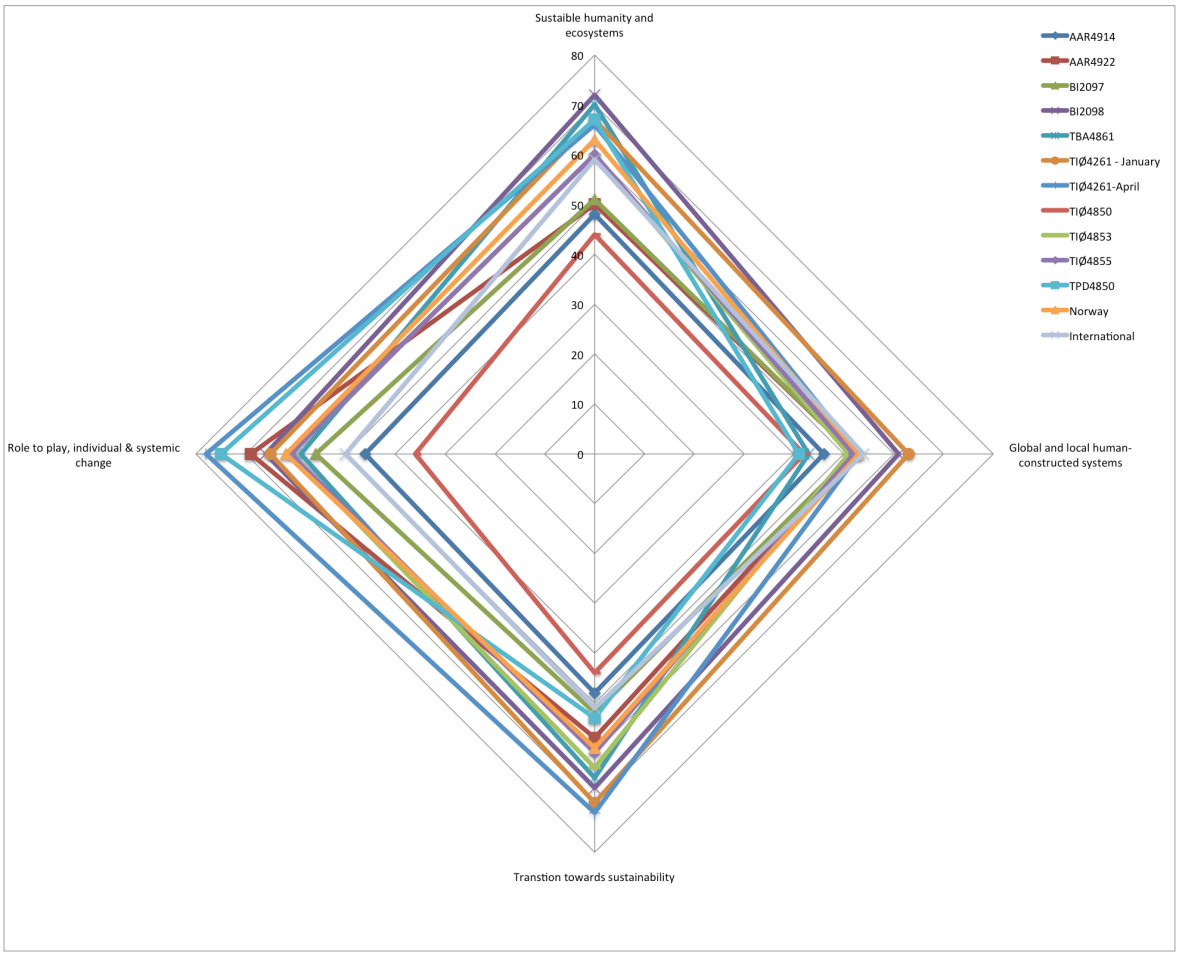


**Figure 4: Average score on the themes in CORE International**

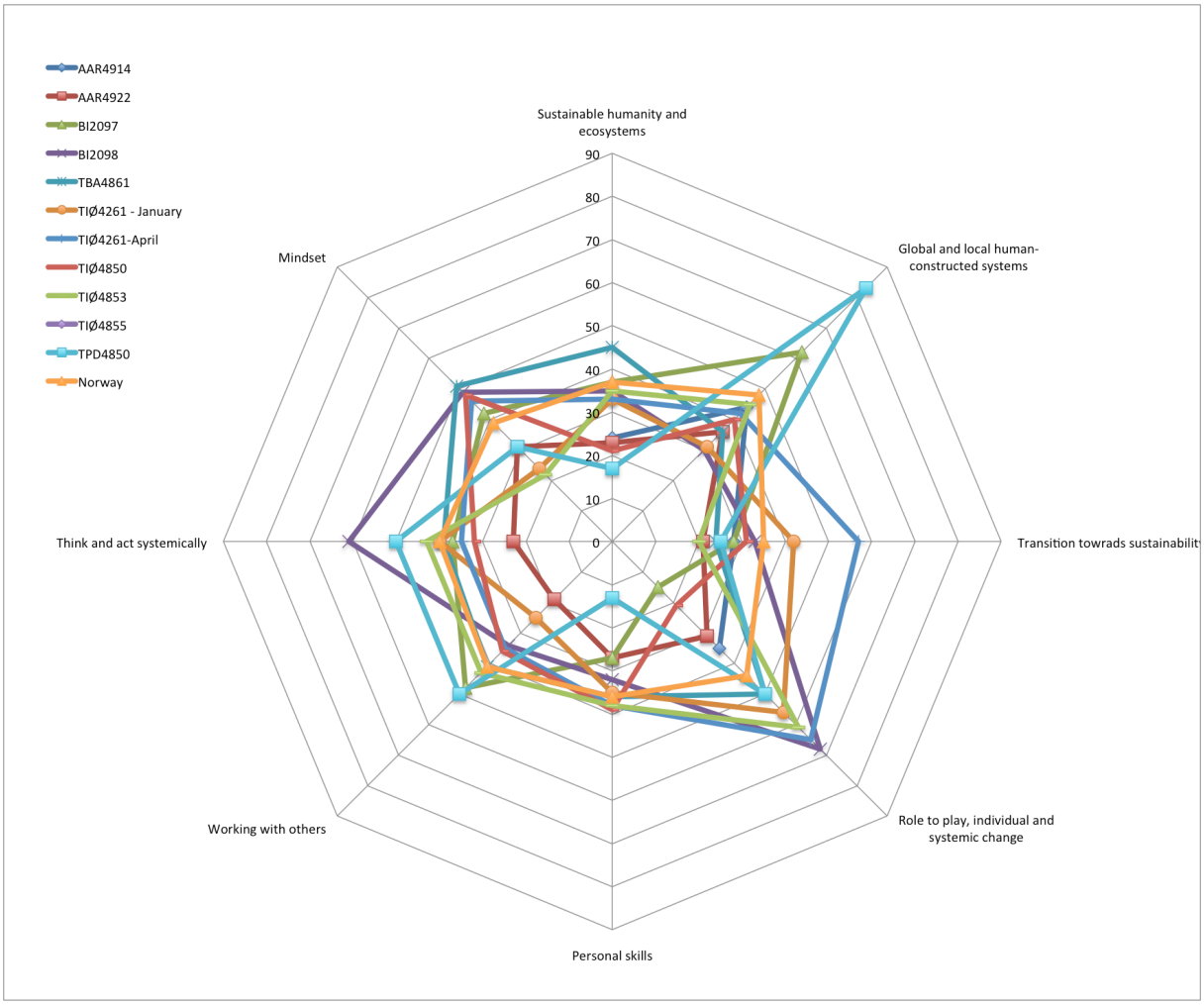


**Figure 5: Average score in the themes in SPEC Norway**

## 4.1 NTNU and Sustainability

The vision for NTNU is "knowledge for a better world" and in this vision they state that NTNU wants to contribute actively to the accomplishment of the UN SGDs. In the strategy they list up expectations for NTNU in 2025. Her the last point is "We have contributed to knowledge for a better world by setting clear priorities and for our efforts and resources in line with the UN's Sustainable Development Goals" (Norwegian University of Science and Technology, 2018). The strategy doesn't say anything about how to contribute or reach the goals. (Norwegian University of Science and Technology, 2018)

In the period 2014 – 2023 NTNU have 4 strategic research areas (TSO): Energy – Energy for a better society, Health – Innovative Solutions to complex health challenges, Oceans – Knowledge for sustainable oceans, and Sustainability – Knowledge for a change. They are all in different ways linked to Sustainability and the UN SDGs, so on the research area NTNU is having a large focus on sustainability. The question is if the focus from research is reflected into the education at NTNU? (NTNU, 2017)

NTNU have more than 100 courses that include sustainability, and the engineering students have had sustainability course as mandatory in over 25 years. (Karvinen et al., 2017)In the spring 2018 NTNU made a new part of their website where they made an guide to projects at NTNU that contributes to the 17 SDGs. In April 2018 they are not available in English, and

the general impression is that there is a large focus on research and innovation, and not so much on Education. They list up the study programs that have focus on the specific goal, but these lists are extremely short with 1-5 study programs out of approximately 400, it is many of the same programs that are mentioned under different SDGs. (NTNU, 2018b) On social responsibility and environment they are using the same sentence on SDG7, SDG9 and SDG11, SDG12, and SDG13: "NTNU should be a pioneer when it comes to use knowledge from research to make sure our activities are sustainable". (NTNU, 2018b) In general is the impression that this website is a draft that needs more work. Already in June have the web site developed and there is more information, ore study programs have been listed up etc. It still needs even more work, but is a good start.

At NTNU the property division have set up a environmental ambition for the period 2012-2020 at NTNU. This ambition have 15 goals, among them goal 12: "all students that graduates from NTNU should have basic knowledge about sustainable development"(NTNU Eiendomsforvaltningen, 2012) and in the reviewed version of this from 2016 the Sulitest is suggested as a way to reach this goal and measure it.(HMS-avdelingen NTNU, 2017)

According to Christian Solli, environmental advisor haven't it been much focus on this ambition after "old NTNU" was merged together with several university colleges and the conditions for the property division changed. There will probably be made a new environmental ambition that covers the whole "new" NTNU, this does not include goal 12 because the environmental knowledge of the students aren't the property divisions responsibility. Accoding to Solli there was no plans for moving this goal to another one of NTNUs strategies and documents.

Rector at NTNU, Gunnar Bovim want's a new national research centre, SFF (Cenre for Excellence) with focus on environment and sustainable development at NTNU.(Furberg, 2017) Today NTNU have 6 SFFs and is partner in 3 outside the university. NTNU also have 2 SFU (Centre for excellence in education). All the centres include sustainability in one way or another.

The department of social science and education have made their own strategy for the period unitil 2025, in this strategy they focus on how they can contribute to NTNU's strategy "visio for a better world". They focus on how the faculty can contribute to knowledge for a better world and the SDGs through their wide understanding of sustainability and the knowledge about how individuals, society, environment and technology are connected. At the SU-faculty they wants to develop knowledge for sustainable development and have a special focus on the SDGs in their process with internationalisation. (Fakultet for samfunns- og utdanningsvitenskap, 2018)

### 4.1.1 EiT

EiT is an interdisciplinary course that is mandatory for all 4th year students at NTNU in the spring semester. The students choose a village that is working on a topic were the student solves problems related to that topic in groups. There is two types of villages: Intensive villages that is working every day in a few weeks, and semester based villages that is meeting one day a week during the semester. The villages have up to 30 students in each, and the villages is divided into groups that works to solve problems related to the theme of the village. (Otte, 2016) In this study Sulitest have been tested in 9 EiT-villages, both intensive and semester based ones.

There is approximately 80 villages the students can choose from, with approximately 25 students in each. Several of the villages is linked to the TSO Sustainability and several of the villages are tagged with sustainability. (Bjørn, 2015, HMS-avdelingen NTNU, 2017)

The groups are interdisciplinary and they are encouraged to work with external co-operation partners. They have several exercises during the course, and should learn team work skills and reflect upon them in an experience based learning process. This ends up in a report with both focus on both the project and the process. (Otte, 2016)

## 4.2 NTNU and the Nordic Sulitest

At NTNU the Sulitest was introduced through the Nordic Sulitest project in 2016, a project from the NSCN. Together with UiO NTNU developed questions for the Norwegian Module, which was made in a process together with the modules for the other countries in the project, based on the experiences from Finland were Sulitest had been used at the University of Oulo since 2014. This made it possible to compare the results not only on a global level but also on a national and regional level. (Hermansen and Selbekk, 2017, Karvinen et al., 2017)

In the pilot period at NTNU in the school year 2016/2017 5 classes did take the test, and further 1 class did take the test in the fall term of 2017.Those who did take the test in the pilot face had an average score in the international module on 51%, slightly above the international average.(Karvinen et al., 2017) This thesis builds on the experiences from the pilot and is mainly focusing on the 10 classes that did take the test in the spring term 2018.

There have been made local modules for Finland, Sweden, Denmark, Faroe Island and Norway. In the summer 2017 the test had been used on more than 10 students at universities in Denmark, Sweden, Finland and Norway. Table 2 shows which universities that have been using Sulitest in the Nordic countries and how many students that have taken it before the summer 2017. (Carteron and Decamps, 2017) NTNU is listed with only 82 students in this table, today it is over 300. This illustrates that the numbers is a little bit old, even when it is only one year ago. There is 2 norwegian universities and one organization that is registered as user of Sulitest. It is 8 institutions registered in Sweden, 5 in Finland, 1 on the Faroe Islands, 4 in Denmark and 1 on Iceland. In total is 22 institutions in the Nordic countries registered as users of Sulitest, only 7 of them had 15 or more students that had completed the test last year. (Sulitest, 2018)

Karvinen et al (2017) presents the first overview of the sustainability literacy in the Nordic countries and experiences with using Sulitest, focusing mainly on the national modules. The paper presents results from the pilot phase at 4 universities in Sweden, Finland and Norway. “The main purpose of the Nordic project’s pilot was to gain experiences on how the test could be used in teaching and to explore if there were to trivial or too demanding questions.”(Karvinen et al., 2017)

The Nordic Sulitest was planned to last for 2 years but unfortunately the project did only get funding for 1 year. Because of the limited time frame, the project did only have time to create the national modules and collect data from the first round. According to the original project plan, the modules would have been re-evaluated and improved after the first experiences, according to Meeri Karvinen who was the project manager.

The project group has only meet once, and Karvinen believes that if they had had more time and meet several times, there might have been better opportunities to develop the Nordic

Sulitest further. She also believes that in order to activate the use of the Sulitest and push its development further, the project would require someone dedicating his/her time to managing the project. Since there neither is a dedicated project manager at the moment or any funding for the Sulitest the universities have not had support from the project; and therefore the project haven't met its full potential. Karvinen believes that if the group could meet again and establish a new project with some financial and human resources, it would be possible to create more activities around the Sulitest in the Nordic countries. Today the Sulitest is used at Oulu University (Finland) and Gothenburg University (Sweden). At Roskilde University (RU, Denmark) have the Sulitest been used and the Danish module have been discussed at a seminar with Aalborg University (Denmark). According to assistant professor Thomas S. Grindsted (RU) is the test probably still in use somewhere at the university.

An ideal Sulitest module has equal amount of questions in all themes and subthemes of the Sulitest. In the Norwegian module and the other national modules is the distribution between the themes not equal and makes a large weakness for the modules. The modules have not been updated since they were created and are only linked to tags, not the SDGs. The quality of the questions also varied. (Karvinen et al., 2017)

**Table 2: Sulitest at Nordic universities (Carteron and Decamps, 2017)**

| University | Country | Candidates |
|---|---|---|
| **University of Gothenburg** | Sweden | 445 |
| **Oulu Business School, University of Oulu** | Finland | 167 |
| **NTNU** | Norway | 82 |
| **Aalto University** | Finland | 37 |
| **School of Business, Economy and Law at the University of Gothenburg** | Sweden | 27 |
| **KTH – Royal Institute of Technology** | Sweden | 21 |
| **Technical University of Denmark** | Denmark | 15 |

## 4.3 Sulitest at NTNU spring 2018

In the spring term 2018 the test have been offered to the students in 12 classes. 9 of them did take the test in class, while 3 classes only got an introduction and was encouraged to take the test in class. Out of these 2 were normal classes while the rest was EiT-villages. 10 out of 80 EiT-villages at NTNU this spring did participate in this project. The way the students got an introduction to the test varied. Most of them got the introduction to the test in class and also 60 minutes to take the test, in that time most students have completed the test. A few classes only got introduction and maybe time to 1-2 questions in class, and had to do most of it at home while one only got it on the e-learning platform Blackboard and had to do everything at home. In total 205 students did complete the test in the spring 2018 at NTNU, 107 of these also responded to the survey at the end of the session. Information about the classes and when they did take the test can be found in the appendix. A weakness of the study is that all of the courses that have participated are somehow related to sustainability, and the students might have a larger interest in sustainability than the average student.

The teachers responsible for the courses have not been involved in Sulitest themselves, they have only given away time in their classes to someone else performing the test, or have published the link and a code to enter the session on Blackboard. The responsible teacher received their results on e-mail one week later when the session was closed.

### 4.3.1 Survey

In the end of each test the students get the possibility to respond to an international survey from Sulitest. The responses in this give an overview of the students' background, interest and involvement in sustainability, how the university perform on sustainability in their opinion and if the Sulitest has been useful.

107 responses from 8 classes have been used for this project. All questions from the survey that have been included in the study can be found in the appendix. The students are from over 8 different main fields of studies and over 7 different nationalities.. The mean score on Sulitest for the students participating in the survey is 69 points of a maximum 120 points on the international part. This gives them 57% expected answer. The international average on this module is 55% while for students in Norway it is 58%.

From table 4, 5, 6 and 7 can we see that there is a tiny overweight of male in the group of respondents with 53% male, and that Norwegians is overrepresented with almost 80% of the respondents. Only 3,7% of the respondents is taking a PhD, the rest is master students, this is natural because the study have been performed in courses that is mainly offered to 4$^{th}$ year (master) students.

Engineering, Manufacturing and Construction is the dominant field of study with Natural Science, Mathematics and Statistics as the second largest group (table 6). This dominance of technology and natural science studies can be explained by the courses that have participated in the study. The courses that have participated are all interdisciplinary and elective, but they are held at Gløshaugen, the campus where almost all civil engineering, technology and natural science studies in Trondheim are held and by department and faculties with mainly engineering studies. Most of the courses also have engineering students as target group.

**Table 3: Nationality of respondents**

| Nationality | Number of students | Percent of students |
|---|---|---|
| Norwegian | 85 | 80% |
| French | 1 | 1% |
| Danish | 1 | 1% |
| German | 8 | 8% |
| Chinese | 2 | 2% |
| Other | 9 | 8% |

**Table 4: Gender of respondents**

| Gender | Number of students | Percent of students |
|---|---|---|
| Male | 57 | 53% |
| Female | 49 | 46% |
| Rather not say | 1 | 1% |

**Table 5: Respondents main field of studies (definitions by UNESCO)**

| Main field of studies | Number of students | Percent of students |
|---|---|---|
| **Social sciences, Journalism and Information** | 6 | 5,6% |
| **Business, Administration and Law** | 10 | 9,3% |
| **Engineering, Manufacturing and Construction** | 46 | 43% |
| **Health and Welfare** | 3 | 2,8% |
| **Information- and Communication Technologies** | 5 | 4,7% |
| **Arts, Humanities and Languages** | 2 | 1,9% |
| **Natural Science, Mathematics and Statistics** | 20 | 18,7% |
| **Agriculture, Forestry and Veterinary** | 1 | 0,9% |
| **Other** | 14 | 13,1% |

**Table 6: Which degree the respondents are pursuing**

| Degree pursuing | Number of students | Percent of students |
|---|---|---|
| **Graduate degree (Master)** | 103 | 96,3% |
| **Postgraduate or Doctoral degree** | 4 | 3,7% |

In the work with this thesis it has also been discussed to start the work with making the Sulitest to a more integrated part of the studies at NTNU, and see if it is possible to involve a larger group in the work with Sulitest, including involve more teachers that wants to use Sulitest as a part of their courses, as a teaching tool or a tool to map the knowledge and to start the work with improving or make a new Norwegian module. Therefore have the Sulitest been presented in a meeting at the advisory board for education at the Department of Social and Educational Sciences in May. According to Tine Arntzen Hestbek, Vice Dean Education at the Department of Social and Educational Sciences are they absolutely interested in using Sulitest, and will present is at a potential tool for their teachers in a workshop for study program managers in September.

# 5 Analysis and results

The analysis of the data collected will be divided in several parts and will be performed with different methods described in chapter 3. The search for literature have been performed with a strategic search and a review of the most relevant articles. The data collected through Sulitest international survey, e-mail surveys and interviews will be presented here together with the documents of stakeholders.

## 5.1 Literature

Table 7 shows the results from the strategic literature search, ”Sulitest gives to few results, while those who includes ”tool” have way to many results.

**Table 7: Results from strategic literature search**

| Keyword | Oria | Scopus | Sage journals | Google schoolar |
|---|---|---|---|---|
| **Sulitest** | 6 | 2 | 2 | 45 |
| **“Sustainability literacy”** | 289 | 65 | 23 | 2200 |
| **“Teaching sustainable development” + “higher education”** | 193 | 4 | 4 | 585 |
| **”Teaching sustainability” + ”higher education”** | 609 | 22 | 22 | 2280 |
| **“Teaching sustainable development” + “university”** | 297 | 5 | 7 | 1 |
| **“Teaching sustainability” + “university”** | 873 | 44 | 33 | 3620 |
| **“tool” + “sustainability” + “university”** | 153 614 | 100 841 | 29 984 | 2 240 000 |
| **“tool” + “sustainable development” + “university”** | 70 517 | 59 885 | 4236 | 563 000 |

In the following parts I will give a descriptive review of some of the literature this study builds on.

### 5.1.1 Sulitest: A Collaborative initiative to support and assess sustianability literacy in higher education: Décamps, Barbat, Carteron, Hands & Parkes, 2017

This article written by the founders of Sulitest and others working in the Sulites organization describes the background of Sulitest, how it can be used and the purpose of the Sulitest. It’s

main purpose is to highlight the contribution of Sulitest to the global agenda. The article also presents a snapshot of the Sustainability Literacy worldwide at that time. It is using "the Sulitest platform as a case-study to investigate the current state of sustainability literacy in higher education" (Décamps et al., 2017) It also using the case study to "engage higher education institutions in monitoring the impact of sustainability integration in their pedagogy and/or research on students' sustainability literacy." (Décamps et al., 2017)

Together with their first report to the UN HLPF from Sulitest the article gives background information and data about the Sulitest. The weakness of this is the objectivity that might be weak because the organization and not a neutral author write it.

According to Decamps et. al.(2017) is education intertwined with building a sustainable future, an that "a major role of education is to empower individuals and future decision-makers so that they are able to face the complex and key challenges of the 21st century."

Sustainability in higher education "refers to a broad scope of initiatives including pedagogy and learning, academic research, campus management, practices and impact as an organization."(Décamps et al., 2017) Sulitest believes that in the future it will be necessary to prove your sustainability literacy skills in the same way that you prove your English skills when applying for a job today, and is therefore creating a tool for measuring and document these skills. (Décamps et al., 2017)

ESD practices have traditionally been more visible in primary and secondary education than in higher education in the member states of UN until the Rio+20 education which represents a turning point "where the focus was put not only on the right to access to education, but also on the responsibility of higher education"(Décamps et al., 2017) for the first time in the UN history writes Décamps et. al. (2017) The HESI- initiative formed under the conference counted for more than one third of the voluntarily commitments from the conference and in the time after the conference have the ESD-concept spread to several universities. (Décamps et al., 2017)

The framework that is in the UN SDGs is a good roadmap for higher education to coordinate initiatives from the UN like the GAP and PRME according to Décamps et. al. "In this context, a critical issue for higher education is the ability to assess and report on the impact of their sustainable practices on students' awareness and core sustainability literacy."(Décamps et al., 2017) Sulitest is tools that can help universities with this. To measure and report will according to the authors be critical for universities to contribute to SDG 4.7 and the rest of the Agenda 2030.

To empower individuals to contribute to the agenda it is important to help them develop necessarily skills and mind-sets for sustainable development that contributes to development of their sustainability literacy. Sustainable literacy are defined as "the knowledge, skills, and mindsets that help compel an individual to become deeply committed to building a sustainable future and allow him or her to make informative and effective decisions to this end"(Décamps et al., 2017) For university will this be to "enabling students to develop competencies such as critical, holistic, systemic and interdisciplinary thinking."(Décamps et al., 2017)

Sulitest should be a tool to measure the sustainability literacy that should be relevant both locally and globally. The strength of Sulitest is the database with results from over 550 universities in 57 countries that provide a snapshot of the current situation for sustainability

literacy in higher education worldwide. It can be used to better understand behaviours and identify opportunities for change. (Décamps et al., 2017)

### 5.1.2 Sustainability literacy and engineering – Experiences from a literacy test as a teaching and assessment tool in Nordic Universities: Karvinen et. al.

Karvinen et. al (2017).sums up experiences from developing the Nordic national modules for Sulitest and the first experiences from using them in engineering studies at 3 technical and 2 other universities in Norway, Sweden and Finland among them NTNU. Further it discusses the test as a tool for integrating sustainability in the curriculum in engineering education.

Their conclusion is that "The test has weaknesses regarding its use as a curricula development tool, but it can facilitate teachers in engineering education in drawing a comprehensive picture on the problems future engineers are required to solve"(Karvinen et al., 2017) and that the test can be a better tool for measuring progress than to test the exact level of sustainability literacy. To use it as a tool to assess sustainability content in curricula should be done with caution.

The results from this study should be a benefit for teachers that are interested in promoting sustainability literacy in higher education, and presents the first picture of the level of sustainability literacy among students in the Nordic countries.

The responses from 700 students were used as data material for the study, the vast majority of them were master students. The national modules that was developed was made up of 25-31 questions, the paper concludes that this is some of the weakness of the modules, and especially that there is to few questions in some themes. According to Karvinen et. al. are there a large amount of difficult questions in the Norwegian module compared to the other Nordic modules.

The Nordic modules have a large weakness in imbalance in the number of questions representing different themes and the authors recommend a re-evaluation of the questions in the modules and make a better balance between the themes. This weakness makes it hard to compare between courses, universities and countries because students who are good in the themes with many questions probably will have a better score than those who are good on the smaller themes.

Results from the study shows that the national modules are more difficult than the international module for the respondents, and that there was a statistically significant difference between those who keeps up with news about sustainability often compared to those who only keep up with the news rarely. Karvinen et. al.(2017) concludes that Sulitest "measures respondents' level of awareness, all-round education and personal interest, rather than the level a university has been teaching sustainability subjects"

Despite the weaknesses they recommend that the test can be used to measure progress in a course and that teachers and students can have good use of the resources in the questions with the references.

### 5.1.3 Integrating Sustainable Development in Higher Eduation through Experience-based Learning- Insights from Experts in Team (EiT) for Developing a Combined Theoretical Framework: Otte, Pia Piroschka

This article is based on a case study done at the Centre for Rural Research at NTNU and presents ”a combined framework for implementing sustainable development as part of a curriculum that not only provides theoretical education about the topic but also furthers a behavioural change among its participants towards more pro-environmental actions.”(Otte, 2016)

In general this is an interesting and relevant article because it has the same keywords and is a case study on experts in team at NTNU, which is the same theme, course and university as this thesis is about.

Otte (writes in her introduction that Sulitest “presents a good starting point but more ways of integrating the students directly in a course on sustainable development are needed”(2016). Her article is then focusing on how to reduce the gap between environmental awareness and knowledge, and pro-environmental behaviour.

The main focus of Otte’s article is to explore how the learning technics used in EiT can be used to fill in this gap and encourage behavioural techniques, and she doesn’t mention much about how to use Sulitest. This, and that she never mentions Sulitest again after the introduction is the reason why her article haven’t been used so much for background in this study, except for some background information about the course EiT.

## 5.2 Students

The responses from the students were used to give an overview of their thoughts about Sustainability at NTNU and their involvement and interest in sustainability.

The responses have been analysed with SPSS into frequency tables and tables where the means are compared. Because most of the non-Norwegian students are exchange students I have divided most of the results in Norwegian and non-Norwegian, which gives responses from only Norwegian students that have NTNU as their university where it is relevant and in other questions it give a possibility to compare NTNU with a group of others.

The score of the NTNU students in this project have also been compared with the world average scores presented by Sulitest in their report to the UN-HLPF in 2017.

### 5.2.1 Background information about the students

Table 8 shows that the Norwegian students have a mean score on 68,18. The score of Norwegian students are lower than the average non-Norwegians, which is at 72,8 in the global part. At the Norwegian module the Norwegians score better than the internationals. Table 9 shows that the PhD-students have a slightly better score than those at master level, this is an expected outcome because PhD-students have been studying for a longer period, have been top-students and probably have a large interest in sustainability as reason for choosing courses that have focus on sustainability. The study has mainly been performed on courses for 4$^{th}$ year students with focus on sustainability.

**Table 8: Mean score of respondents, divided by nationality.**

| Nationality: | Number of respondents Core International | Number of respondents SPEC Norway | Mean Score Core International | Mean Score SPEC Norway |
|---|---|---|---|---|
| Norwegian (spring 2018) | 87 | 83 | 68,18 | 31,6 |
| Other (spring 2018) | 20 | 10 | 72,85 | 27,8 |

**Table 9: Mean score of the respondents divided by which degree they are pursuing**

| Degree pursuing? | Mean score Core International |
|---|---|
| Graduate degree (Master) | 68,88 |
| Postgraduate or Doctoral degree | 73,50 |

### 5.2.2 Involvement

In table 10, 11 and 12 the mean score for the students are divided in groups after their interest in sustainability, if they keep up with the news and how involved they are in sustainability. These tables show a correlation between interest and involvement in sustainability and a high score in Sulitest. The more interested and involved, the better score. There are some exceptions to this rule. In table 11: Mean score divided by interest in sustainability where those who are always interested have a lower score in both modules than those who have chosen that they are often interested. In the Norwegian module have those who is occasionally interested also a better score than those who is always interested. The most interesting thing here is that the second best score is hold by those who is not at all interested.

When it comes to involvement in sustainability (table 10) do those who is never involved have a slightly, unimportant bit better score than those who is occasionally involved. The most interesting here is that those who is deeply involved have the lowest score in average 10 points lower than those who is occasionally involved. The more the students keep up with the news about sustainability the better score.

**Table 10: Mean score divided by involvement in sustainability**

| How involved are you in sustainability work? | Mean score Core International |
|---|---|
| Not at all | 68,75 |
| Occasionally | 68,61 |
| On a regular basis | 74,09 |
| Deeply involved | 58,50 |

**Table 11: Mean score divided by interest in sustainability**

| How interested are you in sustainability on a daily basis? | Core International | SPEC Norway |
|---|---|---|
| Not at all | 50,50 | 31,5 |
| Occasionally interested | 64,45 | 30,03 |
| Often interested | 72,29 | 33,08 |
| Always interested | 72,06 | 29,07 |

**Table 12: Mean score divided by how the respondents keeps up with the news about sustainability**

| Do you keep up with news about sustainability? | Mean Score Core International |
|---|---|
| Never | 53,00 |
| Rarely | 65,88 |
| Often | 72,12 |
| Try to all the time | 74,50 |

### 5.2.3 NTNU's performance

Only 11% of the Norwegian students that have responded to the survey responded that the inclusion of sustainability in the curriculum was determinant when they did choose university, and almost 60% did not pay attention to it at all (table 14). For the non-Norwegian students the numbers where 28,6 and 21,4.

It is also interesting that table 13 shows that almost 10% of the students responds that sustainability isn't included in the university's curriculum and 39,1% responds that it is only included in dedicated topics. This numbers is in harmony with the oral feedback in class from students that have taken the test. Many of them have not had sustainability before the class where the Sulitest was performed.

From table 15 it is clear that the Norwegians don't know if sustainability is required for graduation with approximately ¼ of the students doesn't now, 44% says no and 32% yes. Before the test the students got an introduction to the test and the background, in

this it was included a power point slide with the goal of NTNU's environmental ambition "all students that graduates from NTNU should have basic knowledge of sustainable development". Most of the students thinks that NTNU is doing satisfactory or have a high performance on sustainability other than pedagogy (Table 16) , a large group, 32,9% feels NTNUs performance are unsatisfactory while only 2,4% have responded that it is non-existent

**Table 13: Respondents opinion about sustainability in curriculum**

| Is sustainability/sustainable development included in you university's curriculum? | Norwegian students | Non-norwegian students |
|---|---|---|
| Not at all | 9,2% | 0% |
| In dedicated courses on the topic | 39,1% | 73,3% |
| In related courses (in which sustainability/sustainable development is not the main topic) | 44,8% | 26,7% |
| I don't know | 6,9% | 0% |

**Table 14: Respondents paying attention to inclusion of sustainability in curriculum when choosing university**

| When choosing to study at your university, did you pay attention to the inclusion of sustaiable development in the curriculum? | Norwegian students | Non-norwegian students |
|---|---|---|
| Not at all | 59,3% | 21,4% |
| Just for information | 29,1% | 50,0% |
| It was determinant for me | 11,6% | 28,6% |

**Table 15: Do the respondents know if sustainability is required for graduation at their university?**

| Is sustainability required for graduation at your university? | Response from Norwegian students |
|---|---|
| No | 44,2% |
| Yes | 32,6% |
| I don't know | 23,3% |

**Table 16: Respondents opinion about their universitiy's performance on sustainability other than pedagogy and research**

| Universitys performance on sustainability other than pedagogy and research? | Response from Norwegian students |
|---|---|
| Non-excistent | 2,4% |
| Insufficient | 32,9% |
| Satisfactory | 59,8% |
| High Performance | 4,9% |

### 5.2.4 Awareness of the SDGs

Figure 6 shows how the different courses that have taken the Sulitest as part of this project have scored on the different SDGs. While figure 7 shows how the students at NTNU have responded to the questions as one group. Here we can see that the awareness on SDG2, SDG14 and SDG15 is high with 75% or more of the students have chosen the expected answer. In the other side SDG1, SDG3, SDG5, SDG6 and SDG10 has over 50% not expected answer. SDG3 also has 24% of "I'm not sure".

There is no goal with complete awareness (>90% expected answer) at NTNU and no goal with a very low level of awareness (<10% of expected answer). SDG1 and SDG3 has a low level with 24% and 27% of the expected answer.

Figure 6 shows that TPD4850 have complete awareness of SDG2 and SDG15 with 100% of expected answer on both, and no awareness of SDG5 with 0% of expected answer. The weakness of TPD4850 is that it is only 4 respondents in this group. There is two groups with a complete awareness of SDG14, TBA4861 with 100% and TIØ4853 with 91%. BI2098, TIØ4861 (jan) and TPD4850 is close with 89% and 88% expected answer. TIØ4850 is the only group except for TPD4850 that has low awareness of one of the goal with only 7% of the expected answer on SDG5.

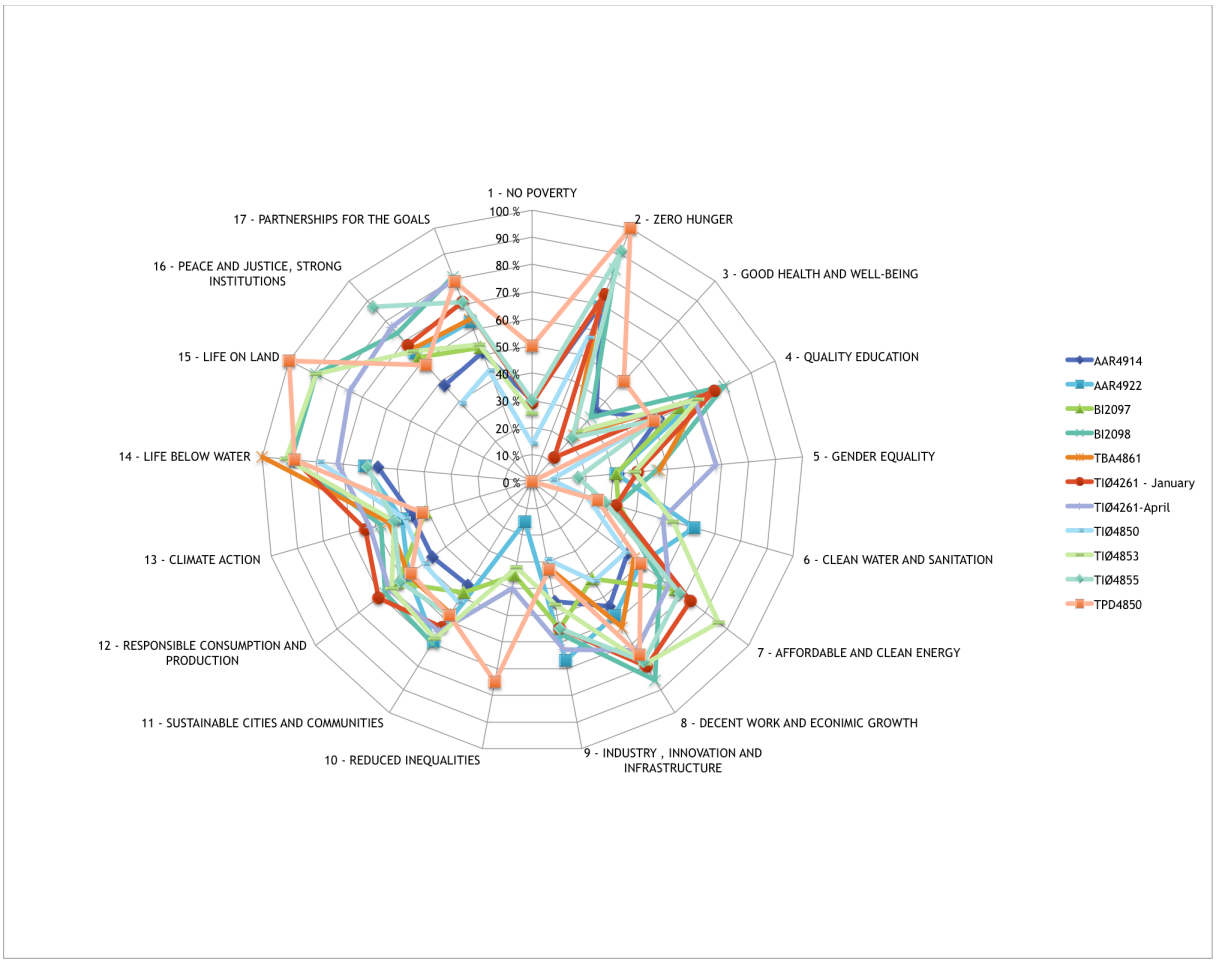


**Figure 6: Average score on the SDGs sorted by course**

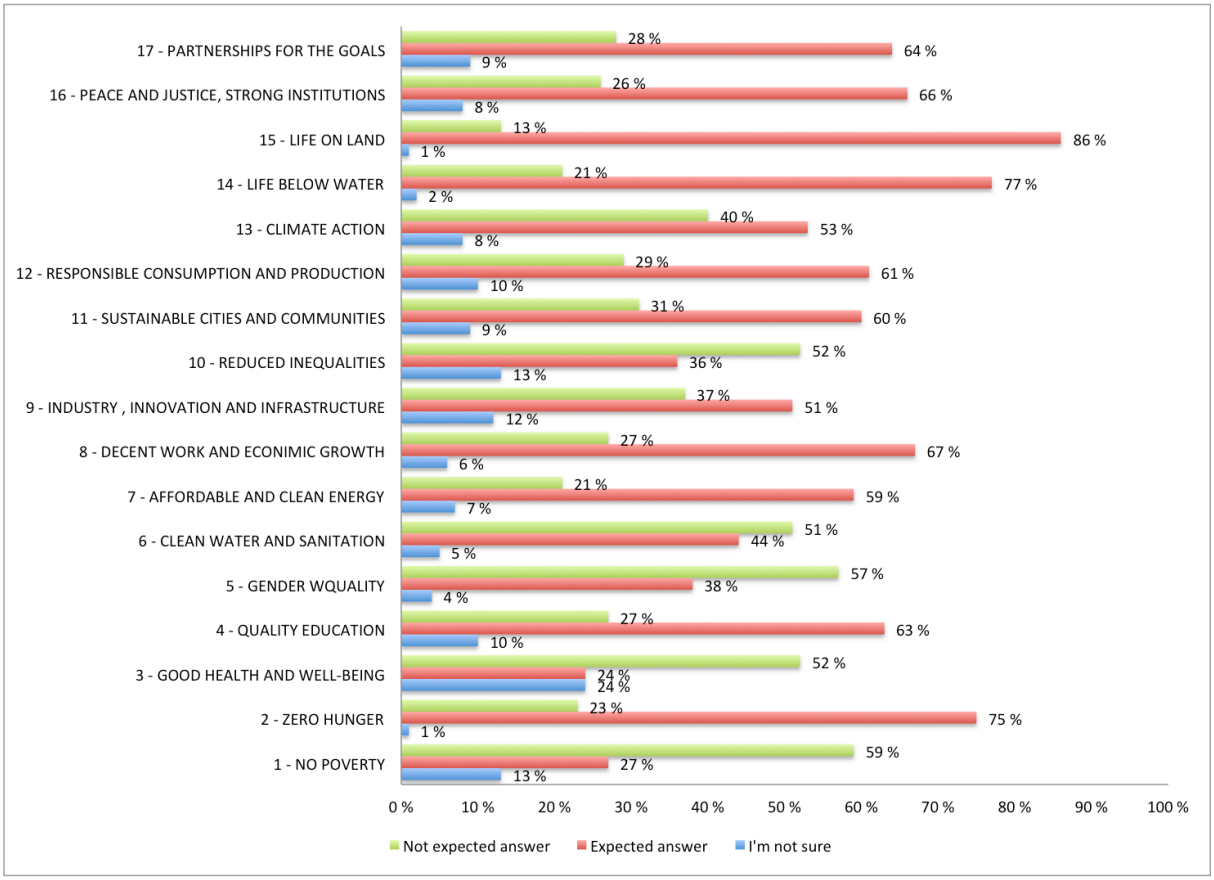


**Figure 7: Responses on SDGs at NTNU**

Figure 8 compares the awareness of the SDGs at NTNU with the global awareness. NTNU have a much larger awareness of SDG2, SDG14 and SDG15 and also a higher awareness of SDG4, SDG7, SDG9, SDG12, SDG13, SDG16 and SDG17. The awareness of goal 8 is equal with 67% of the expected answer both globally and at NTNU, while NTNU have a lower awareness of SDG1, SDG3, SDG5, SDG6, SDG10 and SDG11.

In the 4 themes of the UN HLPF there is no theme where the students at NTNU have a high level of average at all the goals. Figure 9 shows how NTNU scores in average in the 4 themes compared to the international average. NTNU has a better average score in the themes "Transformation towards sustainable and resilient societies" and "Partnerships for the Goals". In the theme "Eradicating poverty and promoting prosperity in a changing world" the international average is 1% better than the average at NTNU, while NTNU has a lower average in the last theme "Empowering people and ensuring inclusiveness and equality"

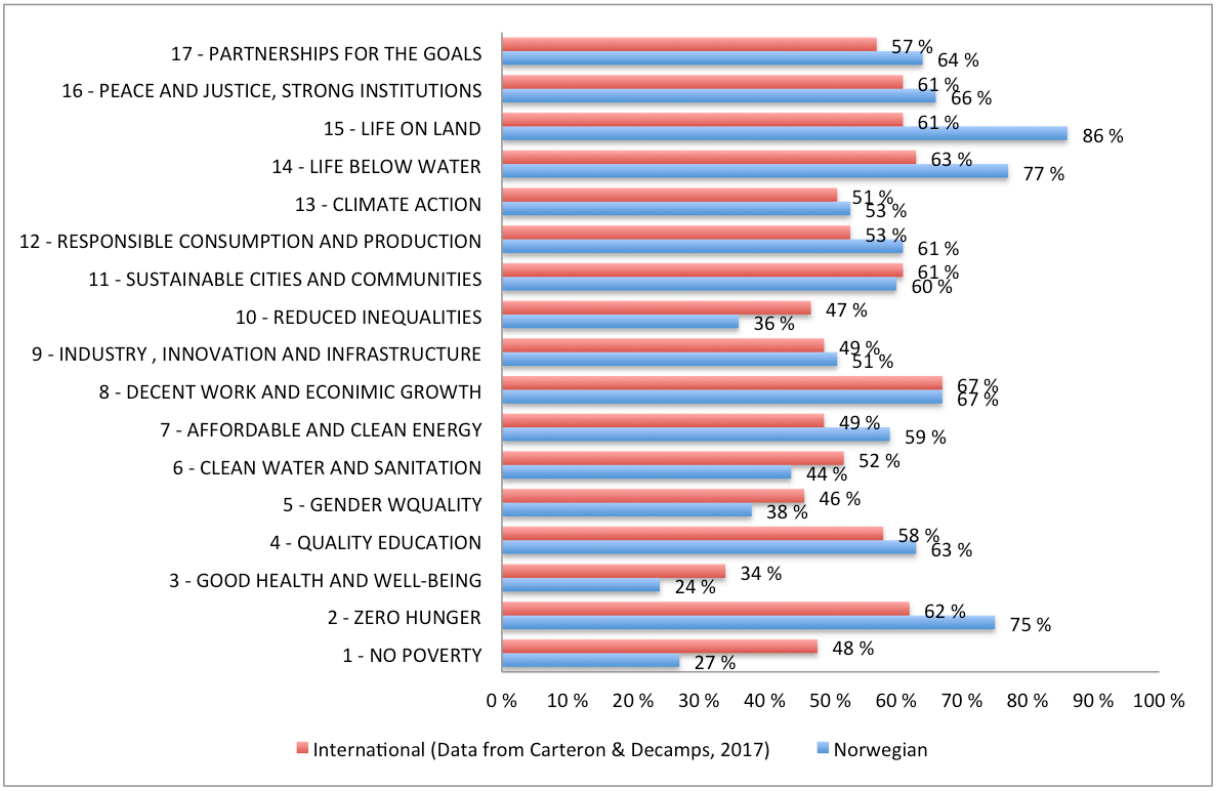


**Figure 8: Percent of tudents having the expected answer on the SDGs internationally and at NTNU**

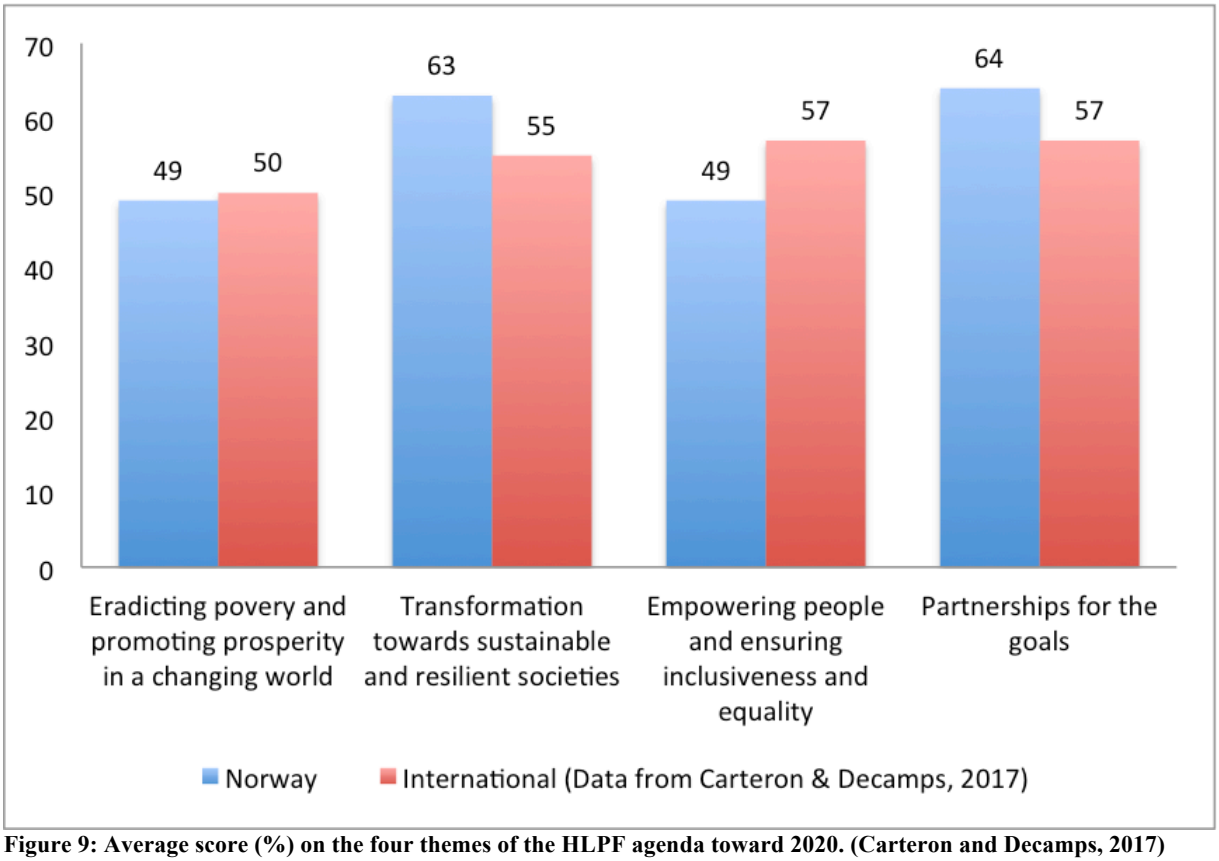


**Figure 9: Average score (%) on the four themes of the HLPF agenda toward 2020. (Carteron and Decamps, 2017)**

## 5.3 Experiences with using Sulitest

Table 17 shows that 9 classes did get an hour to take the test in class, while 2 got an introduction in class. 1 class did only get the test on the e-learning platform Blackboard while 1 class did take the test 2 times and the second time they only got the test on Blackboard. The classes that got an introduction to the test and also time in class to take the test have a larger number of participants, especially participants that completes the test as we can see in table 18. A test takes approximately 1 hour when both the international core module and the regional module for Norway is included. Some students complete this much faster while others are using more time. In this project the test have normally been open for a week, so those who don't have time to complete everything at once can log in later and complete it.

**Table 17: Distribution method and participation**

| Course | Distribution of the test | Completed test/registered |
|---|---|---|
| **AAR4914** | In class | 23/24 |
| **AAR4922** | In class | 13/17 |
| **BI2097** | In class | 26/26 |
| **BI2098** | In class | 19/20 |
| **PSY3809** | Online - Blackboard | 0/2 |
| **TBA4861** | In class | 22/22 |
| **TIØ4261 – jan** | In class | 34/44 |
| **TIØ4261-apr** | Online – Blackboard (retest, had introduction in class the first time) | 20/27 |
| **TIØ4850** | In class | 14/16 |
| **TIØ4853** | In class | 28/30 |
| **TIØ4855** | In class | 23/24 |
| **TPD4200** | Introduction in class, had to take the test at home | 0/11 |
| **TPD4850** | Introduction in class, had to take the test at home | 4/5 |

One problem was that this project is a master thesis and the teachers responsible for the courses was contacted in the middle of January, when they already have planned the courses and already held the first lecture. This was too late in the process for many to participate, and most of them found time to give away in class, but not so much possibilities to include the results in the teaching.

In this study have it been mandatory to participate, and it is few classes where 100% of the students have taken the test. Because if the time that are necessary to complete a test that also is challenging are there many that don't complete, especially if they don't have time to it in class. Here an advice from Anja Stoll, Head of Community and Content Development in Sulitest is to make it mandatory and/or take enough time in class. Because an hour is a long time, and for those who choose to use it as a teaching tool with using the resources in the question as a starting point for discussions will it probably take even more time are Stoll suggesting to divide it and for example take 5 questions in each lecture during the term.

The feedback from students that did take the test was mixed. In general they were positive, but some believed that it was to many questions that takes to much time.

A weakness is that the Norwegian module is only available in English. Because of the lack of a Norwegian module in Norwegian all students have to take the test in English. Feedback from students tells that the English language in the test is advanced and makes the test harder than it really is. Many students gave feedback that some of their knowledge got lost in translation that they did know the expressions in Norwegian but the expression in English didn't give the same understanding. There were also some critiques of questions including math. In general the critique on the questions in the test was difficult English and math questions that didn't take into account that some students have challenges like dyslexia and dyscalculia. These problems made a student wonder if the test was testing her sustainability knowledge or her English language? An e-mail from that student can be found in the appendix. This e-mail sums up much off the feedback from students about the weakness of Sulitest.

## 5.4 Stakeholders

The first question asked in the identification process was "to whom does the organization have legal obligations?"(The International Organization for Standardisation, 2010) The first and most obvious are the employees and the students. The University have large legal obligations towards both groups and these are those who might be most directly affected by a decision about implementing Sulitest at the university. The students and employees are also answer to many of the other questions used in ISO 26000: 2010 to identify stakeholders.

It was not a large number of teaching staff that was a part of the study, and I did not receive many responses on it. Because of few responses it will only be presented as a short summing up of both those who responded on the survey, and other feedback that was received from teaching staff in the courses where the Sulitest was performed in the spring semester 2018.

Those who gave a response wrote that they liked the test, but that it needs to be developed further. They all were a little bit unsecure about using it in later classes, but with a more natural integration of it they would use it. But they were not sure that EiT was the right place to take it in. Neither of them has used the results directly, but some have taken the time to reflect about it, and the students have included some of what they learned from it in their group work and papers. The students had been engaged by the test, and the teaching staff felt that the students had a learning outcome from the test.

The government is another large stakeholder with a special position. They own the university and have its representatives in the board, but at the same time the university is a autonomic institution. The government makes directions for the university, among them to contribute to the states policy and contributions, among them the Paris Agreement and the UN SDGs.

After NTNU had published their annual report in June 2017 the Ministry of Education and Research gave a response on the report where they made clear their expectations to NTNU in the years to come. Among the expectations was more integrating of research in the education, that NTNU would follow the principles from the white paper about quality in higher education and a strengthening of the teacher education. (Bjørgan, 2017)

The power to make decisions at NTNU lies at the board, but NTNU is a large organization with decision makers at all levels, among them department, faculties, and lecturers. All these are also stakeholders as individuals, organizations and organizations representing stakeholders.

I started to challenge NTNU as an organization, rector and his management team and the faculties at twitter on how to reach the goal from the environment ambition that "all students that graduate from NTNU should have basic knowledge about Sustainability." This tweet can be found in the appendix. Unfortunately there was no response.

The dean at the Faculty of Social and Educational Sciences and her vice-deans wrote in Universitetsavisa about how NTNU should contribute to the SDGs in the education. The SDGs are a global challenge that needs an interdisciplinary approach and they are linked together, it isn't a checklist where you can solve them one by one. To contribute to the goal it is important to see them together and work for solutions in a partnership between education, business and others. They focus on the need for an interdisciplinary approach, and that the students wishes about including sustainability in all courses and study programs. In this article they focus on how their faculty can contribute to the interdisciplinary approaches that is necessary to solve the challenges addressed in the SDGs. In the end they challenge their colleagues at the other faculties of NTNU to consider if they do enough for the SDGs? (Daugstad et al., 2018)

Tine Arntzen Hestbek, Vice Dean Education at the Department of Social and Educational Sciences have been interested in including Sulitest at the department next year, and sees it as a problem approach that is relevant in all diciplines. She sees the possibilities to use the test as a tool for mapping, and to introduce sustainability in courses.

### 5.4.1 Student's opinion on Sulitest and sustainability in the curriculum.

As shown in table 18 is it a very small part of the Norwegian students that responded "no" on the question "is Sulitest useful" and no non-Norwegian students responded "no". For the Norwegian a large group didn't know if it was useful or not. Still ¾ of the respondents did say yes. This shows that the students are positive to the test and probably have learned something from it.

**Table 17: Are Sulitest useful in the respondents opinion?**

| In your opinion is the Sulitest useful? | Response from Norwegian students | Response from non-Norwegian students |
|---|---|---|
| **Yes** | 73,0% | 92,9% |
| **No** | 5,9% | 0% |
| **I don't know** | 21,2% | 7,1% |

The Student Parliament, an organization representing all students at NTNU. They had for the last months been working on a Sustainability platform describing their politics about Sustainability in Education at NTNU. The Platform demands that all students at NTNU should take the Sulitest.(Studenttinget NTNU, 2018) According to the dean and vice-deans at the faculty of Social and Educational Science do the students want to have sustainability in all courses, and not in specialised sustainability courses. (Daugstad et al., 2018)

In the boards there are two students, they don't give statements as board members. Anja B. Andersen is one of them, and has told me about her thoughts about the Sulitest and sustainability at NTNU as a student, not a board member. She does not like the idea of making the Sulitest mandatory, it can be a possibility for the students to take it, but no one should be pushed into it. When it comes to the student's knowledge about Sustainability she want it to be up to the study programs to decide what they want to include in their program about sustainability, and if they want to focus on only parts of sustainability like economic sustainability in the economy programs and social sustainability in politics etc.

Young Friends of the earth at NTNU is another stakeholder; unlike most of the others this organisation is more external, at the same time their members are students at NTNU with a large interest in sustainability. They work local and global for sustainable development. They don't have much policy on the education at their university. In general is their opinion that sustainability is not a large priority at NTNU. The university is doing much good, but are contributing to many unsustainable, environmental dangerous research projects. In the education part they think that the content and focus is good in the study programs that includes sustainability, but are worried about the focus in the study programs that doesn't include sustainability in the main profile. Sustainability in all courses is in their interest and they see Sulitest as a good tool that can contribute to a larger awareness at NTNU.

# 6 Discussion

NTNU have responsibility to contribute to sustainable development. This responsibility is recognized by NTNU with their vision "Knowledge for a better world" and the strategy document where they wants too active contribute to the SDGs. The ministry of education, which is the owner of NTNU and the other public institutions for higher education in Norway have a responsibility for the Norwegian follow up of SDG4 and expects NTNU and the others to contribute to this and the other SDGs. The SDGs are interdisciplinary and connected with each other, they can't be reached one by one like a checklist, but the solutions for sustainable development needs to take all the goals into account. Here NTNU have a large role to play as Norway's largest university with many different disciplines that all have a role to play in the development and implantation of the solutions for a sustainable development.

NTNU is doing much for the SDGs and there is many good initiatives that contributes to sustainable development. But NTNU can do more, especially in the education part. The only goal about sustainability literacy among the students might be removed, and the results from Sulitest this spring shows that the students knowledge about sustainability are related to their interest and involvement in sustainability and that the curriculum at NTNU probably doesn't cover it in a good enough way.

There is much to learn from how other universities have included sustainability in their curriculum and have made whole institution approaches, and how others are using Sulitest. NTNU is not a member of HESI, unlike most of the other universities who are using Sulitest. To join HESI would be a commitment for NTNU that shows that they are willing to contribute to the global agenda in an active way. It will also give NTNU access to networks, conferences etc. where they can learn from other universities and get inspiration to improve their own practices.

## 6.1 NTNUs responsibilities for sustainable development

Already in their strategy recognizes NTNU their responsibility and ambition to be an active contributor to the Agenda 2030 and with that be a social responsible institution. In ISO26000:2010 are the guidelines for being social responsible to "take into account the broader expectations of society". To do that, NTNU needs to learn what the broader expectations from society are.

The owner of NTNU is the state, and when they committed to the SDGs, NTNU was also committed as a public organization. When NTNU published their annual report in July 17 the state was giving feedback on it where they made their expectations to NTNU clear.(Bjørgan, 2017) The government expects NTNU to follow the principles from the white paper about quality in higher education, thin includes education that contributes to development of skills and attitudes and that higher education have a special role to play in the follow up of SDG4 and the other SDGs.

Target 4.7 in the SDGs calls for "that all learners to acquire the knowledge and skills needed to promote sustainable development" The Norwegian government expects NTNU to

contribute and NTNU is also stating that they will do so through their vision, and also the environmental ambition. According to the results from the Sulitest survey have almost 10% of the Norwegian students at NTNU responded that they don't have sustainability in the curriculum at all, and almost 40% of the respondents says that it is only a part of dedicated courses. This number must be seen in the light that the respondents all are taking a course that is related to sustainability, but many of them believed that this was the first time they had about sustainability, in a 4th year elective course.

Over 50% of the students had wrong answer on 5 of the SDGs, and also 24% of the students have respondent that they are not sure on SDG3. These numbers shows that NTNU probably haven't achieved the goal that all students that graduate from NTNU should have basic knowledge about sustainable development when the 4th year students don't feel they have it in their curriculum and also shows a low awareness on several of the goals.

NTNU have the largest teacher education in Norway and the government expects NTNU to strengthen it. One of the targets under SDG4 is to increase the supply of qualified teachers, in the GAP is one of the PAA: "building capacities at educators and trainers". Here NTNU have a large possibility to contribute through influence. Through educating teachers that are sustainability literate and also knows how to teach it will have the possibility to create generations with citizens that are sustainability literate.

The 4th PAA in the GAP is to empowering youth. UNESCO defines youth as those between 15 and 24 years. A large part of the students at NTNU is inside this definition. Through education have NTNU the possibility to give youth the toolbox they need to meet the challenges and create sustainable development. The large teacher education gives NTNU a special responsibility here. This is also the generation that will have to tackle the consequences of the decisions we make today. By empowering their students with the necessary skills and knowledge to face the challenges related to sustainability can NTNU give a large contribution to one of UNESCOs PAAs.

They university is today doing much on the campus part and in research and have started to organize it with the new part of the website that sums up what they are doing for each of the goals, in all parts of the institution. This website shows an overweight of project on research and not so much on the education at the university. Among the expectations the Norwegian government have to NTNU is that they implement more of their research into education. Here they can integrate more of the research on sustainable solutions into the education part.

NTNU is absolutely a stakeholder in several of the Gap's PAAs.. The university can transform learning and training environments, strengthen the teacher education and empower youth. These are fields where NTNU can contribute through education and research. In the field of strengthening local communities can NTNU also contribute with a sustainable campus as well as the teaching and education part. The GAP calls for ESD in at all levels and in all settings, and for whole institution approaches. Here NTNU can do more to implement the whole institution as one unit, today there is many good projects in parts of the institution and the institution wants to be sustainable and have stated to get an overview of what they do with the new part of the website about the SDGs.

Under the PAA4 is the GAP calling for a larger access to use of e-learning tools for youth. Sulitest is an online multiple-choice test and provides a untraditional use of e-learning in a field where there is little research. With the use of Sulitest and further research on the use of it

can NTNU contribute to this PAA and develop an e-learning tool for youth all over the world, including their own students.

The SDGs needs interdisciplinary approaches where research has a large part to play. As the leading technology education in Norway NTNU have a large role to play with educating the students that can develop the technological solutions for the future. NTNU don't only have science and technology among their studies, but also teacher education, humanities and social sciences and through these disciplines they have large possibilities to contribute with not only educating sustainability literate teachers that will educate a new generation that are aware of how to create sustainable development. The students of NTNU will not only develop many of the technological solutions for the future, among the students are also those who have the knowledge about how society will react to them and how to implement them. This makes the sustainability literacy of the students of NTNU into a critical part of achieving the Agenda 2030.

To remove the goal about the student's sustainability knowledge from the environmental ambition of the property division is a right decision, the student's knowledge about sustainability isn't the property division's responsibility, and the goal doesn't fit into the ambition. But, the goal shouldn't be removed from NTNU. It should be moved into a general curricula or get its own strategy about required sustainability knowledge among the students at NTNU. A goal like this is important for clarifying the goals NTNU have about sustainability, and to legitimate sustainability in the curriculum. This goal also builds up on the visions goal about contributing to the SDGs and the expectations from the government on giving the students knowledge and skills to create sustainable development.

## 6.2 NTNUs performance on sustainability

The students' knowledge about sustainability has a connection with their interest and involvement in sustainability. This link is not so clear in this study as in Karvinen et. al.s study of the Nordic Sulitest. This can be a natural difference between the students that have participated in the studies, but also differences between the international module and the Nordic modules. The correlation between the students knowledge and interest can be a sign that the teaching about sustainability is not good enough, the students have to learn about it elsewhere like in the media and through involvement. But this can also be a natural consequence of students interested in sustainability paying more attention to lectures about sustainability and have more background knowledge in the field.

The awareness of the students on the SDGs is very varied from high knowledge on some of the SDGs and lower knowledge on others. The variation between the classes in scores on the different aspects of sustainability is also large, especially on the Norwegian module. These results may indicate that the curriculum covers some parts of the sustainability aspect better than others, but also build up on the weakness in the Norwegian Module.

The average score of the Norwegian score on the international module is slightly above the international average. On the awareness of the SDGs have the students that have taken the Sulitest at NTNU in the spring 2018 a higher score on 10 of the SDGs than the international average. In general shows the results from this study that the students at NTNU are more sustainability literate than an average international students. A weakness with this is that all te

students that have participated at NTNU is mainly master degree students and a few phd students, all enrolled in courses that are related to sustainability. In the international group is students at all levels in their education from the 1st day to graduation on Phd and not all of them are enrolled in study programs with focus on sustainability. Because of this, we can expect the NTNU students to perform better than the average international.

NTNU is already doing much on campus and research to contribute to the agenda, and is contributing to partnerships that are creating sustainable development, especially in less developed countries, war zones and other vulnerable areas. Their strategic research areas all includes sustainability, and the research in general are doing much for finding sustainable solutions to global challenges. The students that have responded to the survey also shows high satisfaction with NTNUs performance on sustainability other than pedagogy and research.

This does not mean that there can't be done more. There is always potential to do more, and NTNU have a large potential to do more in the education part of the universities activities, thin includes to integrate more of the research on sustainability into the education.

## 6.3 How to include sustainability in the curriculum

The students want sustainability as a part of all courses, and not only in dedicated courses. Today many students at NTNU feels that sustainability is only included in dedicated courses or in courses that are related to it. In this project were only classes where sustainability was one of the main topics or the main topic was closely related to sustainability included. Still, almost 10% of the Norwegian students responded that sustainability wasn't included at all in the curriculum at their university. Today there is no common general curriculum about sustainability that is valid for all students at NTNU.

Sustainability and the Agenda 2030 with the 17 SDGs are interdisciplinary in their nature, and needs interdisciplinary solutions. Therefore, the curriculum and teaching about sustainability should have an interdisciplinary approach.

NTNU can learn much of what other universities in the Nordic countries have done to implement sustainability in their education. The university of Gothenburg have highlighted all their study programs with sustainability topics. NTNU have now started on some of the same with listing up those who are related to an SDG on their thematic website for the SDGs, but they haven't included it as a filter on the list of study programs. This is a simple, concrete action that NTNU can learn from.

Approximately 60% of the Norwegian students that have responded to the survey did not pay attention to inclusion of sustainability in the curriculum when they chose to study at NTNU. The inclusion of sustainability was determinant for only 11% of the Norwegian students. For the international students was it determinant for almost 30% when they choose university and only 21% didn't pay attention to it at all. These differences are hard to explain. By some reason it might be more important for the international students than the Norwegian or it can be that there is a larger focus on sustainability in Norway than in other countries, and that the Norwegian students don't pay attention to it because they expect it to be included in all studies? Independent for the reason behind it will it probably be paid more attention to if the infrmation is more available like it is at GU.

GU has much in common with NTNU and is a university that offers a large width in study programs from different disciplines. The project at the different departments to integrate sustainability in untraditional ways like they have done at the academy of arts and drama can be inspirational for NTNU. Also the GMV centre that are operated in cooperation between GU and Chalmers and the challenge lab at KTH are examples NTNU can learn from and that can be inspirational for creating a centre for sustainability, like the one that rector wants at NTNU.

The students at NTNU wants more focus on sustainability, and they want it included in all courses. Here NTNU can learn from the process at KTH where sustainability have been integrated in all engineering and architecture programs. The process with the toolboxes, which is described in detail in the ISCNs report on best practices on sustainability from their members, can easily be copied and adapted at NTNU. The work done in HESI, ISCN and other networks for sustainability in higher education to highlight the best practices is important information that NTNU should use to learn from.

Independently on how NTNU implements more sustainability in the curriculum they need a way to measure their efforts and progress. Sulitest is a tool that can be used to both measure progress on the university and to compare the progress globally, regionally and locally. The tool gives the possibility to compare between departments and create friendly competition between the departments about being the best on sustainability. Sulitest offers interdisciplinary modules that are relevant for all institutions and disciplines, but also gives the possibility to create own modules that can be more discipline specific and in that way Sulitest makes itself into a relevant tool that can be used everywhere.

At the moment there is no natural place for Sulitest a NTNU. There are three courses that are mandatory for all students: Examen philisophicum, Examen Facultatum and EiT. The two first is a part of a bachelor degree in the first or third year while the last is in the second semester in the first year of a master degree ($4^{th}$ year for those in integrated master programmes).

In this project have Sulitest mainly been used in Experts in Team. The aim of Experts in teams is to give students skills for interdisciplinary work in teams. Sustainability literacy is interdisciplinary in its nature, and is also a skill that will be necessary in the future working life. EiT also have the benefit that almost all $4^{th}$ year students take it. A weakness with placing Sulitest at the $4^{th}$ year is that many students graduate after their bachelor degree; they will not meet the Sulitest then. The village leaders in EiT feel that the test is relevant, but that they don't have space for it in courses that are already filled up. The challenge here is that this is something probably "all teachers" will say if you ask them to include something new in their courses? If, Sulitest should be included in EiT the EiT-programme should be reconsidered to include the Sulitest in all villages.

Another option is to learn from the School of Business, Economy and Law at the University of Gothenburg. Here Sustainability has gotten one mandatory day every year for all students across disciplines. The Students here takes Sulitest in the first and last semester of their bachelor degree and then the university makes sure to give them a introduction to sustainability when the study starts, and makes sure they are sustainability literate when they graduate.

Sulitest can be used in different ways to teach sustainability, measure progress in a class and between different classes that takes the same course at different times and in general between students from different years. It can be used to map differences between courses, departments and faculties, and also what might be the largest advantage of Sulitest: the large network of universities that is using Sulitest which makes it possible to compare the results of the NTNU-students with the results of students at other universities in the Nordic countries and globally.

Another large benefit of the Sulitest is that it is a tool that is already created and that it already has support from the UN and some of the best researchers in sustainability are working with the development of the test. The quality of the international module is controlled by an expert panel and the resources connected with the test is large and of good quality.

The community and network connected to Sulitest is also a benefit of this test compared with creating something new. The test already has a large database of results and experiences and is focusing on developing. This gives NTNU a large possibility to use their results to see how they perform compared with others. There is also some data from other Nordic universities, which is an extra benefit for NTNU.

There isn't much activity in the Nordic Network on Sulitest right now, but it exists as a framework, and there might be possibilities to create new life in it. The first Nordic Sulitest was based on experiences from Oulu in Finland. If NTNU starts using Sulitest more active it might be used as a case to learn from for the others, and activity might generate more activity. Another factor is that today there is several Nordic universities registered as user of Sulitest, which shows that there are an interest for Sulitest at HEIs in the Nordics. This gives possibility for creating a larger network, which will strengthen the network and make Sulitest to a better tool for NTNU with the access to a larger network and more Nordic resources and several universities to learn from and compare results with.

It takes time to perform a full session, with a little bit more than one minute per question a session with 30 international and 25 national questions will take approximately one hour, and if the session includes more modules like the UN-DESA module on the SDGs or customized modules it will take even more time. This might be more time than teachers feel they can give away in courses where there is already too little time.

This project have shown that the students that doesn't get time to take the test in class normally don't do it at home as long as it's not mandatory. To make as many students as possible take the test there is different approaches that can be implemented. One is to make it mandatory, which can be done with including it in the exercises that students have to complete to take the exams, but that can be easier to do in some classes than others. The social sciences and humanities normally only have 1-2 exercises per course, which normally is to write a thesis. All exercises needs to be approved. In technology, natural sciences and economy is it more normal to have approximately 10 smaller exercises during the term where 8 of them must be approved. To make Sulitest as a mandatory exercise is easier in the latest model then the first.

The results from this study shows that the classes that is given time in class to take the test have a much larger number of students participating than those who didn't. Especially those courses where the test was only introduced to the students through blackboard had low interest and participation. This is probably because of to little information to the students about why they should use time on the test, which is elective and doesn't affect their grade

when they already have a lot of mandatory work to do? The test is probably to long for students to use their spare time on, and when they don't see a large enough benefit of taking it they don't do it.

To solve the challenges with time is the solution with making it into a mandatory exercise a good challenge for making people respond, but then there is always a question about what is important enough to make mandatory. The results from this study shows that there is large number of students participating when given time in class, even when it is voluntarily. The advice from Anja Stoll about taking a few questions in each lesson can be a good way to make it feel less heavy.

Suliquiz be used as an introduction to the test in classes where the lecturer doesn't feel to use an hour on the test. The problem with the quiz is that with only 10 questions it is not possible to map the knowledge of the students in the same way, the quiz doesn't not present the results as organized data that map the knowledge in categorizes, tags and SDGs like the full version do. The positive with the quiz is that you can choose to make it based on any module. Then it can be used as an addition to a full quiz, or as an introduction to topics like national sustainability issues or the SDGs. If Sulitest develops modules for each of the SDGs it can be hard to go through all those modules in full scale together with the international module and eventually a regional module. The quiz about SDG 8 can for example then be used at the beginning or the end of a lecture with focus on SDG 8 as an introduction to the goal or a test of what the students have learned in the lecture. To use this modules ass an addition to the international and regional can be a good solution in many courses to give introduction to SDGs and themes that are more relevant to them. A challenge is that if everyone only focuses on those themes that are most relevant for their discipline. The danger is that everyone focus on their own problems and don't achieve the holistic approach that are necessary to solve the challenges addressed by the SDGs.

A weakness of Sulitest at NTNU so far is that the teachers isn't involved in the test. The Sulitest have been used by a small group at NTNU, and the test result have been shared with teachers without them using them to improve the teaching. This is partly because they got invitation to use Sulitest to late in the process with planning their courses. But, to be used in a sustainable way and make an impact on the education at NTNU is it necessary with teaching staff that use Sulitest actively. It is also necessary with contributions from different disciplines to strengthen the Norwegian module and create specialized modules.

The student parliament at NTNU wants all students at NTNU to take Sulitest, and the students that have responded to the survey feels that the Sulitest is useful. Out of the Norwegian students was it only 6% that responded that it wasn't useful, and in the international group was it no one that responded that the test wasn't useful. The international students did pay more interest to the inclusiveness of sustainability in the curriculum, and might have a larger interest in sustainability in the curriculum. Their reponses becaumes even more interesting because 93% have responded that Sulitest is useful, with only 7% of I don't know if its useful, compared to the Norwegian students where a much larger group, 21% have respondent that they don't know. The students opinion that Sulitest is useful and the demand from the student parliament shows that Sulitest and more focus on sustainability in the courses is something the students wants

# 7 Recommendation

The goal about the graduate students knowledge about sustainability literacy should not be removed from NTNU, it should be moved from the ambition of the property department into another strategy at NTNU. NTNU should develop a strategy for including sustainability into the curriculum, and this goal should then be a part of this strategy. The student's opinion about sustainability in all courses should be listened to, and NTNU should include a goal about sustainability in all courses in this strategy. As a starting point the courses with sustainability should be highlighted at the website after example from GU. NTNU should also look into whole institution approaches, and consider to join HESI to show that they are contributed to ESD and to gain access to networks and meeting places for learning of others sustainability efforts and to contribute to a more sustainable higher education.

The student parliament wants all students to take Sulitest at least once. Sulitest is a tool that can be used to both teaching sustainability and measure it. This gives possibilities for NTNU to see their performance compared to other universities in a national, regional and global context. NTNU should include Sulitest in their curriculum in a place where it can have a natural place, and where so many as possible of the students gets the possibility to take it. This includes engaging teachers in the use and development of Sulitest.

One of the weaknesses with Sulitest today is that the Norwegian module is ready for revisions or maybe to be replaced with a new one. To make new questions there should be created an expert committee with members from different disciplines to coordinate the work and create questions. In this committee should also other Norwegian institutions be invited It seems to be a interest for Sulitest at many Nordic universities at the moment, and to strengthen the work should NTNU take initiative to a new Nordic Sulitest project, with focusing on improving all the national modules in the Nordic countries. From collaboration like this can the quality of the Norwegian module be improved with both inspiration to create better questions and to control the quality of each others modules. A close relationship between the Nordic modules will also be a benefit for comparing the sustainability literacy between the countries. The work with development of the Nordic modules should include translation of both the international module and the Nordic modules to the Nordic languages.

# 8 Conclusion

NTNU have a responsibility to be social responsible, and contribute to the Agenda 2030. This is an expectation from students, staff and the owner. This is a responsibility that NTNU is recognizing through their vision, and also the environmental ambition. The university is giving large contributions to the SDGs, but the main focus have been on the campus and research, not so much on the education part of the organization.

NTNU have a large possibility to contribute to the Agenda 2030 and especially to the targets 4.7 about acquire learners with the necessary skills and knowledge and 4.c to increase the supply of qualified teachers. With 4000 students in the teacher education can NTNU contribute with new teachers that are qualified, and can create sustainable literate students. In that way is NTNU also contributing to 4.7 since the teacher students will not only themselves get access to necessary skills and knowledge for sustainable education, but also to their future pupils. This is also contributing to the GAPs PAAs about empowering youth and building capacities of educators and trainers.

Through the education are NTNU creating generations that knows how to create sustainable development and also contributing to the GAPs 5th PAA: Accelerating sustainable solutions at local level. Many of the students at NTNU will contribute to the development and implementation of the solutions for creating sustainable development in the future. Others will become leaders and decision makers that maybe will use these solutions, and are aware of why they need to include sustainability in decision-making process. This can contribute to accelerating the process with sustainable solutions at local, regional and global level.

This study shows that the students at NTNU are slightly above the international level on sustainability literacy today, but much of the knowledge probably comes from interest rather than the curriculum and that NTNU can perform better on sustainability in the curriculum. SDG 17 are partnerships for the goals. NTNU are aldready a member of ISCN and should consider to join other networks for ESD. NTNU can use the resources from HESI, ISCN and other networks to learn from the best practices at other universities to improve their own sustainability efforts.

Sulitest is a tool that can be used both to teach and to measure and compare both progress and with other courses, departments, faculties, universities, countries, regions etc. It is a tool that the students wants and sees as useful. The teachers that have used time in their class on Sulitest sees it as useful, but the problem for now is that teachers aren't good enough implemented in the use of Sulitest. To have a succesfull use of Sulitest at NTNU demands more involvement from teaching staff that use Sulitest in their classes and actively contributes to development of it.

Another challenge is to make students take time to take the Sulitest. On solution is to make it mandatory, but that is often not the best solution. This study has shown good results on taking time in class. This can be done with a few questions in every lesson during the term or one hour in one lesson. If the students take the test more than once is it possible to measure progress during the course. If taken in the beginning of the term can the results be used in planning of the lessons to see where the students are at a high level already and which themes the class know less about. The weakness with using the

Sulitest anonymous it that the teacher only gets their results as a group, and if there is large variations between the level of the students he/she will not be aware of it because he/she only get access to the results as a group. Here it is important to empower the students with interest in their own results and make the Sulitest relevant and easy to access for the students, here a simple action here is to work on the language and work with the translations.

Sulitest has the benefit that the tool is already in use globally and have support from the UN. The quality control by the senior advisory board is a proof of quality and the resources linked to the questions give a good starting point for learning about sustainability and sustainable development. This contributes to the quality of Sulitest as a tool, and it demands fewer resources to use Sulitest than to develop a new teaching program and tool for measuring the performance. With the existing database related to Sulitest is it easy to compare the results at NTNU on a local, regional and global level.

The Nordic Sulitest Project was creating the foundation for use of Sulitest in the Nordic countries. Unfortunately the project didn't get funding for more than one year, and didn't reach its full potential. NTNU should take initiative to a new Nordic Sulitest Project with all the universities in the Nordic countries that are using/interested in using Sulitest with a goal to develop the national modules and strengthen the cooperation between the Nordic Universities. A project like this would benefit NTNU with improved resources for teaching sustainability at a local and regional level with a better Norwegian module and with a close relationship between the Nordic modules it will be easier to compare the level at NTNU and Norway with other Nordic countries and universities. This will also contribute to SDG17 and target 4.7 with a partnership that gives learners access to knowledge and skills that are required for creation of sustainable development.

# 9 References

## 9.1 Published references


BJØRGAN, E. H. 2017. NTNUs årsrapport: Dette mener Kunnskapsdepartementet om jobben NTNU gjorde forrige studieår. Available: https://www.universitetsavisa.no/politikk/2017/07/26/Dette-mener-Kunnskapsdepartementet-om-jobben-NTNU-gjorde-forrige-studie%C3%A5r-67635.ece [Accessed 20.06.18].

BJØRN, S. 2015. Læringsarena for tverrfaglig samarbeid - Eksperter i team. *Uniped*, 284-292.

BRUNDTLAND, G. H. 1987. *Our common future,* Oxford, Oxford University Press.

BRYMAN, A. 2012. *Social research methods,* Oxford, Oxford University Press.

CARTERON, J.-C. & DECAMPS, A. 2017. Mapping Awareness of the Global Goals. *Report from the Sulitest, Tangible Implementation of the HESI contributor to the review of the 2030 Agenda* [Online]. [Accessed July 19th, 2017].

CONCIL OF EUROPE - THE COMMITTEE OF MINISTERS 2007. Recommendation CM/Rec(2007)6 of the Committee of Ministers to member states on the public responsibility for higher education and research. *the 995th meeting of the Ministers' Deputies.*

DAUGSTAD, K., HESTBEK, T. A. & REITAN, M. 2018. SU utfordrer NTNUs fakulteter: Hvordan tar vi tak i FNs bærekraftsmål? . *Universitetsavisa*.

DÉCAMPS, A., BARBAT, G., CARTERON, J.-C., HANDS, V. & PARKES, C. 2017. Sulitest: A collaborative initiative to support and assess sustainability literacy in higher education. *International Journal of Management Education,* 15**,** 138-152.

DIAMOND, S. & IRWIN, B. 2013. Using e-learning for student sustainability literacy: framework and review. *International Journal of Sustainability in Higher Education,* 14**,** 338-348.

FAKULTET FOR SAMFUNNS- OG UTDANNINGSVITENSKAP, N. 2018. *Kunnskap for et bedre samfunn: Strategi 2018 - 2025* [Online]. Available: https://www.ntnu.no/documents/1277297667/1279059722/Strategi+SU+2018+-+2025.pdf/7655731a-b554-402c-a13a-4aaa227cf1d2 [Accessed].

FERRER‐BALAS, D., ADACHI, J., BANAS, S., DAVIDSON, C. I., HOSHIKOSH, I. A., MISHRA, A., MOTODOA, Y., ONGA, M. & OSTWALD, M. 2008. An international comparative analysis of sustainability transformation across seven universities. *International Journal of Sustainability in Higher Education,* 9**,** 295-316.

FILHO, W. 2010. TEACHING SUSTAINABLE DEVELOPMENT AT UNIVERSITY LEVEL: CURRENT TRENDS AND FUTURE NEEDS. *J. Balt. Sci. Educ.,* 9**,** 273-284.

FURBERG, K. 2017. Vil ha forskningssenter for bærekraftig utvikling. Available: https://www.universitetsavisa.no/politikk/2017/10/12/Vil-ha-forskningssenter-for-bærekraftig-utvikling-69667.ece [Accessed 10.06.18].

HERMANSEN, J. E. & SELBEKK, L. K. 2017. Nordisk Sulitest ved NTNU - Mai 2017. NTNU.

HESI 2017. 2017 Summary Report. Higher Education Sustainability Initiative,.

HMS-AVDELINGEN NTNU 2017. Miljørapport for NTNU 2016. *Årsrapport 2016: Helse, miljø og sikkerhet.* Innsida.ntnu.no: NTNU.

HOWLETT, C., FERREIRA, J.-A. & BLOMFIELD, J. 2016. Teaching Sustainable Development in Higher Education: Building Critical, Reflective Thinkers through an Interdisciplinary Approach. *International Journal of Sustainability in Higher Education,* 17**,** 305-321.

ISCN SECRETARIAT 2017. Educationg for sustainability - 2017 Sustainable Campus Best Practices from ISCN and GULF Universities.

KARVINEN, M., GRINDSTED, T., KERÄNEN, A., HERMANSEN, J. E., SELBEKK, L. K., SOHLO, S. & SORVARI, J. 2017. Sustainability literacy and engineering: Experiences from a literacy test as a teaching and assesment tool in Nordic Universities. *In:* KARVINEN, M. (ed.) *45th SEFI Conference.* Azores, Portugal.

KOEHN, P. H. & UITTO, J. I. 2017. Universities and the sustainable development future : evaluating higher-education contributions to the 2030 agenda. *Universities and the Sustainable Development Future.* Routledge.

MILLS, A. J., DUREPOS, G. & WIEBE, E. 2012. *Encyclopedia of Case Study Research,* Thousand Oaks, Thousand Oaks : SAGE Publications.

NORWEGIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY, -. N. 2018. Strategy 2018-2025: Knowledge for a better world.

NSCN - NORDIC SUSTAINABLE CAMPUS NETWORK. 2016. *The SuLiTest Project 2016* [Online]. Available: https://nordicsustainablecampusnetwork.wordpress.com/the-sulitest-project-2016/ [Accessed 14.11 2017].

NSCN - NORDIC SUSTAINABLE CAMPUS NETWORK. 2018. *About NSCN* [Online]. [Accessed 02.03.18].

NTNU. 2017. *Strategic Research Areas 2014-2023* [Online]. Ntnu.edu: Norwegian University of Science and Technology. Available: https://www.ntnu.edu/research/strategicareas [Accessed 30.10 2017].

NTNU. 2018a. *Fakta om NTNU* [Online]. Available: https://www.ntnu.no/tall-og-fakta [Accessed 15.04 2018].

NTNU. 2018b. *Fra visjon til handlekraft: Utforsk NTNU i lys av FNs 17 bærekraftsmål* [Online]. Available: https://www.ntnu.no/baerekraftmaal [Accessed 30.04.18 2018].

NTNU. 2018c. *Om institutt for lærerutdanning* [Online]. Available: https://www.ntnu.no/ilu/om [Accessed 14.06 2018].

NTNU EIENDOMSFORVALTNINGEN. 2012. NTNUs miljøambisjon. Available: http://www.ntnu.no/documents/10137/323403/NTNU_Miljøambisjon.pdf/9d9fe7cd-02d3-4342-beca-9af23afac4af [Accessed 30.10.2017].

OTTE, P. P. 2016. Integrating Sustainable Development in Higher Education through Experience-based Learning: Insights from Experts in Team (EiT) for Developing a Combined Theoretical Framework. *Journal of Education for Sustainable Development,* 10**,** 131-159.

STUDENTTINGET NTNU 2018. Bærekraftpolitisk plattform.

SULITEST. 2018. *List of Registered Universities* [Online]. Available: https://www.sulitest.org/en/list-university.html [Accessed 23.06 2018].

SULITEST.ORG. 2016a. Architecture, Tags, …and how to engage topics/issues experts! Available: http://www.sulitest.aleaur.com/files/source/Sulitest V2 - Architecture and tags.pdf.

SULITEST.ORG. 2016b. *Internationally Recognized, Locally Relevant, Collectively Designed* [Online]. Available: https://www.sulitest.org/en/internationally-recognized.html [Accessed].

THE INTERNATIONAL ORGANIZATION FOR STANDARDISATION 2010. ISO 26000: 2010. *Social Responsibility Guidance Standard.*
THE ROYAL NORWEGIAN MINISTRY FOR EDUCATION AND RESEARCH 2017a. Meld. St. 16 (2016-2017). *Kultur for kvalitet i høyere utdanning.*
THE ROYAL NORWEGIAN MINISTRY FOR EDUCATION AND RESEARCH 2017b. Prop. 1 S (2017-2018). *For budsjettåret 2018.*
THE ROYAL NORWEGIAN MINISTRY OF FINANCE 2017. Meld. St. 1 (2017-2018). *Nasjonalbudsjettet 2018.*
UNESCO 2013. Global Action Programme on Education for Sustainable Development as a Follow up to the United Nations Decade of Education for Sustainable Development after 2014.
UNESCO 2014. Roadmap for implementing the Global Action Programme in Education for Sustainable Development.
UNITED NATIONS 2012. The future we want. *the United Nations Conference on Sustainable Development.* Rio: United Nations.
UNITED NATIONS 2015. Transforming our world: The 2030 Agenda for sustainable development. *General assembly 70th session,.*
UNITED NATIONS DIVISION OF ECONOMIC AND SOCIAL AFFARIS: DIVISION FOR SUSTIANABLE DEVELOPMENT 2015. Higher Education Sustainability Initiative: Climate change Action for sustainable development. *From Rio to Paris: Higher Education for Climate Change Action.* UNESCO HQ.
UNIVERSITET, G. 2018. *Kurser och Program vid Göteborgs Universitet* [Online]. Göteborgs Universitet. Available: https://utbildning.gu.se/kurser?&c=search_within~~kurser_program&es=pace,study_form,period,environmental [Accessed 24.06 2018].
ZHU, J. 2017. Take part in the global review of the 2030 Agenda for Sustainable Development - engage with the Sustainability Literacy Test. Office of the Director, Division for Sustainable Development, Department of Ecnomic and Social Affairs, United Nations,.

## 9.3 Unpublished references

Interviews and meetings

- Anja B. Andersen, student representative, 10.04.18
- Anja Stoll, Head of Community and Content Development, Sulitest, 5.12.17, 11.06.18
- Christian Solli, Environmental advisor, NTNU property division, 13.12.17
- Fanny Skirbekk, president Young Friends of the Earth Norway Trondheim Student group. 06.03.18
- Meeri Karvinen, former project manager, Nordic Sulitest, 15.06.18

Short interviews on e-mail:

- Tine Arntzen Hestbek,
- Mattias Sundemo, environmenta coordinator, School of Business, Economics and Law, University of Gothenburg, 19.06.18
- Thomas Skou Grindsted, Assistant Professor, Roskilde University, 16.06.18
-

Unpublished documents

- Sulitest Organization, *Global Assembly outcome*, will probably be published in June 2018

# Appendix

## Appendix A: Courses that have taken the Sulitest in the spring 2018

| Course code | Title | Type | Start | End | Distribution | Number of students Completed/registered |
|---|---|---|---|---|---|---|
| AAR4914 | Gjør byen din bedre | EiT Intensive Norwegian | 22/01/18 | 24/01/18 | In class | 23/24 |
| AAR4922 | Future of wood | EiT Intensive English | 23/01/18 | 24/01/18 | In class | 13/17 |
| BI2097 | Bærekraftig akvakultur I fremtidens matproduksjon | Eit Semester based Norwegian | 07/02/18 | 14/02/18 | In class | 26/26 |
| BI2098 | Saving the worldis not rocket science | Eit Semester based English | 14/03/18 | 21/03/18 | In class | 19/20 |
| PSY3809 | Creative means of Environmental Communication | EiT Intensive English | 19/01/18 | 24/01/18 | Online | 0/2 |
| TBA4861 | Innovativ bytransport | EiT Semester based Norwegian | 31/01/18 | 07/02/18 | In class | 22/22 |
| TIØ4261 | Green Value Creation and Ethical Perspectives | Course – second degree level | 10/01/18<br>04/04/18 | 17/01/18<br>25/04/18 | In class<br>Had to take the re-test at home | 34/44<br>12/15 |
| TIØ4850 | Prosjekt-landsbyen | EiT Semester-based Norwegian | 31/01/18 | 07/02/18 | In class | 14/16 |
| TIØ4853 | Grønn verdiskapning og samfunnsansvar | EiT Semester-based Norwegian | 17/01/18 | 24/01/18 | In class | 28/30 |
| TIØ4855 | Sustainable, affordable housing for all | EiT Semester-based English | 31/01/18 | 07/02/18 | In class | 22/24 |
| TPD4200 | Bærekraftig design | Course – Second degree level | 18/03/18 | 23/03/18 | In class, had to take the test at home | 0/11 |
| TPD4850 | Aktiv Pensjonisttilværelse | EiT Semester-based Norwegian | 14/02/18 | 22/02/18 | In class, had to take the test at home | 4/5 |

## Appendix B: E-mail with critics from an engaged student.

[redacted]
on 31.01, 13.56

hei!
Dette blir på norsk, så du får oversette hvis du vil videresende.

-Språket i testen var veldig lite tilgjengelig. Det var veldig komplisert skrevet, med mange vanskelige ord. Jeg vet ikke om jeg scora lavt fordi jeg bare ikke skjønte teksten, eller fordi jeg ikke visste, ofte trykket jeg "I'm not sure" fordi jeg rett og slett ikke skjønte hva de spurte om, selv etter å ha lest flere ganger.

-I den norske delen var noen ting oversatt mens andre ikke. Noen spurte om forskjellen på county og municipality, og dette var jeg selv usikker på. Når de har oversatt Sametinget, så er det rart at de ikke også har oversatt andre ord som folk kan være usikre på. Generelt burde den norske delen hatt mer oversettelse synes jeg, mange av tingene hadde jeg hørt om, men jeg visste ikke hva det engelske spørsmålet var. Jeg er rett og slett ikke god nok i engelsk til å gjøre det bra på denne testen.

-Ett spørsmål var av typen x% barn er ikke i skole nå, og y% reduksjon bla bla bla befolkningsvekst. Jeg har dyskalkuli, så da blir det veldig vanskelig å svare saklig på dette spørsmålet. Det er mange som har problemer med å regne ut sånn, så det er et veldig dårlig mål på kunnskap.

- Gender male/female/rather not answer er jo sikkert fint, men dekker ikke når jeg er none of the above... En liten ting men.

-Også på den siste delen er det vanskelig å svare når jeg ikke er så god i engelsk, vanskelig å si hva foreldrene jobber med når jeg ikke vet hva ting er. Og det er ubehagelig å skulle spørre og vise at jeg ikke skjønner hva det er spurt om.

Jeg skjønner at dere vil ha en standardisering, men jeg er usikker på om dere måler riktig ting her. Måler dere egentlig språkferdigheter, eller måler dere egentlig kunnskapsnivå?

Okey det var noen tanker. Håper du får brukt det i alle fall!
[redacted]

## Appendix C: questions e-mailed to academic staff after performing Sulitest in their course

- Er bærekraft ein naturleg del av ditt emne?
- Kva er ditt generelle inntrykk av Sulitest?
- Føler du at Sulitesten på noko vis bidrog eller kan bidra til studentane si læring?
- Har resultata frå testen blitt (vurdert) brukt?
- Er testen noko du kan vurdere å inkludere i dine emner seinare? Kvifor? Kvifor ikkje?
- Kan testen egne seg som ein del av eit undervisningsopplegg, og i såfall som læringsverkty eller test?
- Andre kommentarar?

## Appendix D: Questions e-mailed to focal points for Sulitest at other Nordic Universities

- Are your university using Sulitest at the moment? How?
- Do you know if your national module have been developed after the Nordic sulitest? Is the module linked to the sdgs?
- Have your university created customised modules?