



SUSTAINABLE ENTREPRENEURSHIP

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EXECUTIVE SUMMARY

"[...] always keep in mind why we do what we do. And in that way, I actually think that there's a perspective on sustainability that's enormously relevant and exciting when we start to look at, why are we doing this, and what difference are we making when we do this." - Educator, technical/natural science

Why

Sustainable development and sustainable entrepreneurship are fields that have received immense attention during the last decade, especially during the last five years. At the Danish Foundation for Entrepreneurship, we are continuously working to improve our understanding of how to best assist educational institutions at all levels of the education system to implement innovative and entrepreneurial education. Sustainable entrepreneurship has been a strategic focus for the Foundation for many years, but **in order to get more insight into the educators' understanding of the concept, and how they interpret and translate the policy signals into educational processes for their students, it is important to get beneath the institutions' strategic documents** to study their practice as closely as possible.

What

In 2021, we started **a research project which focuses on how educators at higher educational institutions understand sustainable entrepreneurship, and how they translate this into educational courses and programmes for their students** as well as which effects this has on their students. The first phase of this project focuses on Danish universities and their connected incubation environments. The results of this phase are presented in this report. The second phase of the project will focus on professional and vocational higher education, as well as on practicing sustainable entrepreneurs.

How

Interviews have been performed with five educators and 10 students from four Danish universities. In addition to this, four business advisors at three incubators have been interviewed. An interpretivist approach has been applied and our theoretical framework is based on research focusing on competence frameworks for sustainable entrepreneurship, and on sense-making approaches.

Results

Although there has been a strong focus on sustainability for many years, the results of our analysis demonstrate that to many respondents, especially the students, sustainability is **a vague and**

confusing concept. The UN's Sustainable Development Goals play a major role in how sustainability is understood and interpreted, but due to their broad scope, the field's boundaries are not clearly delineated but rather constantly negotiated. This is **especially critical for the incubator environments who request clear models, methods, and tools.**

Neither educators, nor students or business advisors seemed to be familiar with any competence framework in the field. However, we found that **both students and educators often referred to central competences that are included in frameworks focusing on sustainability competences**, such as system thinking and normative and interpersonal competences, rather than entrepreneurial competences such as managing uncertainty and creativity. It thus seems that the **contextual focus on the SDGs paired with practice-oriented teaching methods is sufficient to foster central competences.** However, in order to structure education and make it easier for students to articulate what they have learnt, it would be beneficial with a wider knowledge of the competence frameworks. It might be that **the GreenComp framework** that was published in early 2022 will have this effect.

One of the clearer findings was that **sustainable innovations and businesses are perceived as having lower business potential.** This is unfortunate since **sustainable entrepreneurship**, on average, typically **includes dimensions which entrepreneurship and innovation research has demonstrated to be of importance for innovation and growth** such as **challenges to the established institutional climate, collective action, and diverse networks.** The report thus ends with a discussion of the potential of sustainable entrepreneurship based on the theoretical framework by **Aldrich and Martinez (2015).**

Introduction

In recent decades, sustainable development has moved further and further up the global agenda. Engagement with climate issues, especially amongst young people, has seen explosive growth, and the UN's launch of the 17 Sustainable Development Goals (SDGs) (UN, 2015) marked a clear global shift. Foundations and investors have begun to demand a clear focus on sustainability (Green et al., 2021; Günzel-Jensen et al., 2020; Hart et al., 2017). The educational system has widely incorporated these Global Goals and many universities have included them in their strategies, but the Global Goals are also used as teaching material, as educational goals and for student projects (Tiemann et al., 2018). The discussion over which skills and competencies are especially important to sustainable work and problem solving has spanned several decades, but the frameworks and taxonomies that have been developed have been implemented only to a very limited extent (Bianchi, 2020; Brundiers et al., 2020).

One area that has been heavily influenced by the increased focus on sustainability is entrepreneurship education (Ploum, 2018; Schadenberg et al., 2021). Entrepreneurship is seen both as a reason why we face challenges with climate change and social inequality (Wyness & Jones, 2019), and as a solution to these problems (Hockerts & Wüstenhagen, 2010; Joyce & Paquin, 2016). Politicians, and more and more so investors (Green et al., 2021; Hart et al., 2017; Skonieczna & Castellano, 2020), are beginning to demand increased focus on sustainability. For several decades, the field of entrepreneurship has also had its own internal discussions as to which skills and competencies are most important when acting entrepreneurially (Chen et al., 1998; Moberg, 2014, 2020). The launch of the EntreComp taxonomy (Bacigalupo et al., 2016) gave educators a tool to design teaching and educational goals, but unfortunately, just one of the 15 skills in the taxonomy focused on sustainability. The debate about which skills and competencies are especially important to sustainable entrepreneurship has therefore been considered high priority, and in the last decade we have seen several suggestions for taxonomies and frameworks (Schadenberg et al., 2021).

To many educators, this focus on sustainability has come rather out of the blue. Even though the UN's Sustainable Development Goals has provided a structure, the directives are often vague or phrased in very general terms, and it is therefore up to each individual educator to translate and interpret what a focus on sustainability means for the students (Sterling et al. 2017, Shephard et al. 2018). This means that what is decided on a strategic level materialises in many different ways on the operational level. In this research project, we have therefore chosen to focus on what actually takes place within the Danish universities and within the incubator environments. The study focuses

on five courses in sustainable entrepreneurship at three Danish universities: four on Master level and one on Bachelor level. In addition, two incubator environments which are connected to two Danish universities, and one outside any educational institution, are included in the study.

The research is limited in its extent, but has nonetheless contributed with many insights as to how educators interpret, make sense of, and attribute meaning in relation to the current heightened focus on sustainable development, as well as how they can transfer this understanding to their students in the best possible way. The report is separated into five parts. In the first part, the theoretical background is presented. It focuses on Weick's (1995) sensemaking perspective, as well as the research into competences for entrepreneurship generally, and sustainable entrepreneurship specifically, and how these competences can be evaluated. Next is a brief presentation of our method and data collection. The main body of the report consists of the analysis, which is presented in part three and discussed in part four. The report is summarised in the concluding section where we likewise discuss future implications.

Theoretical background

Research which focuses on sensemaking, i.e. how agents research, interpret, make sense of and act on novel messages, directives and events, is primarily undertaken within organisational studies (Maitlis & Christianson, 2014). Focusing on the sensemaking that takes place in interaction with other agents - often as a reaction to sudden changes that create uncertainty and ambiguity - is seen as a way for researchers to gain insight into the actual transformation processes (Weick, 1995). Rather than focusing on leadership and decision makers in organisations, sensemaking focuses on how sense is created within the entire organisation. Often, the central research object is this: how are signals from leadership and the surroundings perceived, and how do agents in different organisational levels act on these signals in sensemaking cycles (Weick et al., 2005).

The way in which institutions and changes within the institutional climate affect this sensemaking has not previously been investigated to the same extent, but in recent years, more and more researchers have called for increased focus on the subject (Lounsbury & Glynn, 2001; Maitlis & Christianson, 2014; Weick, 2005). The change that has taken place in recent decades - and which has accelerated in the last couple of years - regarding a focus on sustainability (Brundiers et al., 2020; UNESCO, 2017), can be seen to reflect a change in the signals that are communicated from the institutional system (Pastakia, 2010). Recently, the UN has launched its 17 Sustainable Development Goals, and these make up a sensemaking framework (Donnellon et al. 1986, Morgan 1986), which

agents must interpret and base their actions on (Gioia et al., 1994). Within a short period of time, this framework has had great influence on educational systems (Tiemann, Fichter & Geier, 2018) and entrepreneurial ecosystems (Günzel et al., 2020). Many financiers and much venture capital that have not previously wanted to accommodate sustainable innovations and businesses (Randjelovic et al., 2002), have now on the whole changed their focus (World Bank, 2015). Even if there is still a long way to go (Clark et al., 2017), this interest from the side of venture capital marks a clear shift (Green et al., 2021; Hart et al., 2017; O'Rourke, 2010). The same can be said for state development funds and foundations that finance research and development projects (OECD, 2016).

These cognitive, normative, and regulating forces have of course had a great influence on both educational systems and entrepreneurial ecosystems. Categories can, however, be shaped and interpreted differently in different contexts, depending on the activities in different agents' sensemaking (Weick et al., 2005). According to Weber (2003), the institutional system just shapes, defines and presents the problems, while leaving it up to the actors in the system to come up with solutions. The system, sustainable technologies and regulations cannot innovate in themselves, since innovation demands concrete action from people (Blok et al., 2016). How educators understand, shape and act on signals from the system by adapting their teachings to these signals, greatly influences how they mediate this to their students, i.e. how the next generation interprets sustainable work, its possibilities and limitations, and to what extent UN's Global Goals for Sustainable Development are internalised, as well as whether the students will act on and in accordance with the Global Goals.

Competence frameworks and taxonomies

One of the simplest ways to structure teaching is through clear educational goals (Anderson et al., 2001; Bloom, 1956). It is important that pupils and students can get a sense of to what extent they reach the educational goals, and that it is possible to give specific feedback as to what needs to be improved (Boud, 1995). This is important when the course subject has vague and diffuse concepts and definitions (Moberg, 2014). According to O'Byrne et al. (2015), many educations that focus on sustainability lack articulated educational goals. For this reason, many students struggle to articulate what specific competences they have learnt (Barber, 2016).

In order to advance educators and create legitimacy for sustainability education, a number of attempts have been made by organisations (Bianchi et al., 2022; UNESCO, 2017; UNECE, 2011) and researchers to develop competence frameworks and taxonomies that identify the central

competences for sustainable behaviour and sustainable problem solving (see f.x.: Barth et al., 2007; Cebrián et al., 2020; Glasser & Hirsh, 2016; Redman & Wiek, 2021; Rieckmann, 2012; Vare et al., 2019; Wiek et al., 2011).

Many researchers have stressed the importance of considering “sustainable competences” as parts in a cohesive framework (Engle et al., 2017; Glasser & Hirsh, 2016; Wals, 2015; Wilhelm et al., 2019). Recently, an international research group completed a Delphi study¹ (Brundiers et al., 2020). It was based on the established framework (Wiek et al., 2011; Wiek et al., 2016), which identifies the following six competences as especially important: 1) system thinking, 2) future thinking, 3) value thinking, 4) strategic thinking, 5) interpersonal competence/collaborative competence, 6) integrated problem-solving competence. The experts approved of this framework with just a few adjustments, but they added a seventh competence: 7) implementation competence, and they discussed whether an eighth competence, “intrapersonal competence”, should also be included. In table 1, an overview of the competences is presented.

Competences	To be able to...
System-thinking competence	In collaboration, analyse complex systems across different areas (society, environment, economy, etc.) and across different scales (from local to global). And thereby being able to account for cascading effects, inertia, feedback loops and other systemic functions related to questions of sustainability and frameworks within problem-solving of sustainability problems.
Future-thinking competence	To be able to iterate and continuously refine one’s own futures thinking (visions, scenarios, etc.), in productive and explicit tension to the status quo; recognizing the implicitly held (and largely unrecognised) assumptions about how society works and how they influence the status quo and critically reflecting how they might influence futures thinking
Value-thinking competence	To be able to differentiate between intrinsic and extrinsic values in the social and natural world; to recognize normalised oppressive structures; to identify and clarify one’s own values; to explain how values are contextually, culturally, and historically reinforced; to critically evaluate how particular stated values align with agreed-upon

¹ A study in which experts on a specific topic fill out various surveys, discuss and comment on previous findings, in order to reach consensus about a specific topic (Linestone & Turoff, 1975).

	sustainability values; and to differentiate between espoused values and practised values.
Interpersonal competence	To be able to apply the concepts and methods of each competence not merely as “technical skills,” but in ways that truly engage and motivate diverse stakeholders and to empathically work with collaborators’ and citizens’ different ways of knowing and communication.
Integrated problem-solving competence	To be able to combine and integrate steps of the sustainability problem solving process or competences, while drawing on pertinent disciplinary, interdisciplinary, transdisciplinary, and other ways of knowing.
Strategic-thinking competence	To be able to recognize the historical roots and embedded resilience of deliberate and unintended unsustainability and the barriers to change; to creatively plan innovative experiments to test strategies.
Implementation competence	The collective ability to realize a planned solution toward a sustainability-informed vision, to monitor and evaluate the realization process, and to address emerging challenges (adjustments), recognizing that sustainability problem-solving is a long-term, iterative process between planning, realization, and evaluation.

Table 1: Competences for sustainable action and sustainable problem solving (based on Brundiens et al., 2020)

The addition of “Implementation Competence” to the competence framework was discussed, since it was not deemed fitting for all educational institutions, since it, unlike the other cognitively oriented competences, is more practically oriented (Brundiens et al., 2020). Sustainability research is seen as a committed science that contributes to change, but that change typically happens through partnerships with practitioners (Hart et al. 2016; Kates 2011; Lang et al. 2012; Miller et al. 2014; Oberlack et al. 2019; Wiek et al. 2015; Yarime et al. 2012). The experts in favour of including *Implementation Competence* in the framework believe that this division of labour between science and practice should be reduced. Moral reflections are triggered by action, just as action is triggered by moral reflections (Blok et al., 2016; Lans et al., 2014; Mogensen & Schnack, 2010; Pohling et al., 2015). This emphasises the importance of combining sustainability and entrepreneurship.

Just as competences within sustainable action have been debated for several decades (Sterling et al., 2017; Shepherd et al., 2018), researchers and practitioners within entrepreneurship have discussed which competences can be considered as key competences for acting entrepreneurially (Chen et al.,

1998; DeNoble et al., 1999; McGee et al., 2009; Moberg, 2014, 2021; Rasmusen & Moberg, 2016; Williams-Middleton et al., 2021). The development of the EntreComp taxonomy was, however, important in terms of entrepreneurial competences (Bacigalupo et al., 2016). On behalf of the EU Commission, the Joint Research Centre (JRC) gathered experts and practitioners from the field and, through several meetings and iterations, developed a framework that identifies three main thematic areas, each of which is defined by five competences. A taxonomic understanding of how these competences develop, based on increased levels of complexity and autonomy, makes this framework applicable within all educational institutions.

Combining these two highly debated areas is anything but easy. Entrepreneurship educators often view sustainability as merely “a supplement” (Lans et al., 2014; Ploum et al., 2018), and it is not uncommon for those in the field of sustainability to be very sceptical about entrepreneurship (Wyness & Jones, 2019). Sustainable change takes action, but it is also important for entrepreneurs to gain greater awareness of their social and ecological responsibilities (Cohen & Winn, 2007; Dean & McMullen, 2007; De Clercq & Voronov, 2011; Giacalone & Thompson, 2006; Hockerts & Wüstenhagen, 2010; Joyce & Paquin, 2016; Lourenço et al., 2013; Pacheco et al., 2010; York & Venkataraman, 2010). Despite the increased focus on sustainability generally, and sustainable entrepreneurship specifically, it is a subject that still struggles to gain academic legitimacy (Rodríguez-García et al., 2019).

Sustainable entrepreneurship is a relatively young field that has gone through several reiterations. According to Schaper (2010), the origins of the field can be traced back to researchers who in the early 90’s gave the field various labels such as “climate entrepreneurship”, “green entrepreneurship”, and “eco entrepreneurship” (Bennett, 1991; Berle, 1991; Blue, 1990). This early interest was followed by a period of silence, after which the new millennium brought increased interest (see for instance: Adeoti, 2000; Andersen, 1998; Anderson & Leal, 1997; Cohen & Winn, 2007; Dean & McMullen, 2007; Dixon & Clifford, 2007; Hostager et al. 1998; Isaak, 1998; Keogh & Polonsky, 1998; Kyrö, 2001; Larson, 2000; Pastakia, 2002; Schaltegger, 2011). However, by far the most articles have been published within the last five years (Schadenberg et al., 2021, Sharma et al., 2021).

One of the reasons why sustainable entrepreneurship has struggled to find a foothold within university education is that it is an action-oriented discipline, which often defies testing via conventional methods (Biberhofer & Rammel, 2017; Brekken et al., 2018; Burden & Sprei, 2020;

Castro, 2020; Herman et al., 2020; Jennings et al., 2015; Parris & McInnis-Bowers, 2017; Silva et al., 2018). In order to test it as a discipline, clear educational goals are important. Taxonomies and competence frameworks that focus on sustainable entrepreneurship are clearly influenced by earlier frameworks that focused on sustainable competences (see for example Bernhardt et al., 2016; Biberhofer, 2019; Lintner, 2016; Mindt & Rieckmann, 2017). For instance, the competence framework developed by Lans et al. (2014) and validated in a Ph.D. dissertation by Ploum (2018), are based on the theoretical frameworks of De Haan (2006), Hesselbarth & Schaltegger (2014), Rieckmann (2012), and Wiek et al. (2011). For this reason, tools for evaluation that are based on these frameworks become context specific and difficult to use with a control group. We developed a survey with a focus on eight competences, wherein we avoided the most context specific wordings in Ploum’s scale for competences within sustainable entrepreneurship. The way in which these competences are described in the survey is presented in Table 2.

Competence	The ability to...
Foresighted thinking competence	Collectively analyse, evaluate, and craft “pictures” of the future in which the impact of local and/or short-term decisions on environmental, social and economic issues is viewed on a global/cosmopolitan scale and in the long term.
System thinking competence	Identify and analyse all relevant (sub)systems across different domains (people, planet, profit) and disciplines, including their boundaries.
Interpersonal competence	Motivate, enable, and facilitate collaborative and participatory sustainability activities and research.
Normative competence	Map, apply and reconcile sustainability values, principles, and targets with internal and external stakeholders, without embracing any given norm but based on the good character of the one who is involved in sustainability issues.
Embracing diversity and interdisciplinary competence	Structure relationships, spot issues, and recognize the legitimacy of other viewpoints.
Strategic	Collectively design projects, implement interventions, transitions, and strategies for

management competence	sustainable development practises for the improvement of the sustainability of social-ecological systems.
Creativity competence	Develop ideas and solutions to already existing - and new - challenges.
Handling uncertainty competence	Feel safe to make decisions when the available information is partial or ambiguous, or when the decision involves uncertain results.

Table 2: Competence framework for sustainable entrepreneurship. Based on Lans et al. (2014) and Ploum (2018)

The survey (see appendix) was successfully tested with a limited number of students, but needs validation in more comprehensive studies, which include a control group.

Summary of the theoretical background

Sustainable entrepreneurship is a relatively new subject, and one which has gained increased attention in the last decades, especially within the last five years. It is a merger of two disciplines that have also experienced a substantial increase in interest, but both of these disciplines focus on competences which are difficult to include in traditional education. This conceptual vagueness when it comes to definitions, boundaries, competences, and educational goals, combined with an increased institutional pressure on universities to create more sustainable entrepreneurs, create ambiguity and uncertainty among many educators, while at the same time opening up for new possibilities. Looking into how agents in the entrepreneurial ecosystem, educators and students, make sense of this, can therefore be seen as a highly topical subject if we are to increase our understanding of how we best work with sustainable entrepreneurship in educational institutions. In the following, we will present a brief overview of our methodical considerations, research design and our collection of empirical data.

METHOD AND RESEARCH DESIGN

Unlike many research projects that focus on sensemaking, we are not employing the method of case studies (Yin, 2003). This is because we are interested in gaining insight into how various educators and students, from within several different disciplines, interpret and make sense of the policy push we have experienced over the last couple of years, as well as how agents in the entrepreneurial ecosystem perceive and act on it. We will, though, in accordance with the sensemaking perspective,

take as a starting point an interpreting and interpretivist approach (Packard, 2017; Rabinow & Sullivan 1979). The purpose of this research project is to uncover how educational and competence developing environments contribute to developing competences in sustainable entrepreneurship amongst students at university level, as well as which competences the students acquire as a result thereof. In our analysis of the empirical data, we have coded how informants describe three themes, and we have compared both aspects that are similar, and aspects that vary, between the three groups of research subjects. We are looking for what matters to them while being aware of what is not mentioned.

Selected educational- and competence developing environments

The educational environments that are part of the research project are four courses on a master's level, and one course on a bachelor's level at three Danish universities, that teach entrepreneurship and that, to varying degrees, have a concurring focus on sustainable entrepreneurship. Besides university environments, two incubator environments that are associated with two Danish universities, as well as an incubator environment that is separate to educational institutions, are included in the research project.

The university courses are tailored to master's degree students from different disciplines. The disciplines range from the humanities to natural science, technical/natural sciences as well as health. For the students in this study, the courses that teach sustainable entrepreneurship are either obligatory or only partially elective, meaning that the students have the freedom to choose the course from a set of courses offered, but that they are obliged to choose an elective subject, as per their curriculum.

The two incubator environments that are associated with universities primarily offer advice and sparring activities for students at the university. The incubator environments also work with young people that are about to enter into university education, as well as Ph.D. students and researchers at the university in question, whose projects show entrepreneurial or innovative potential. The third incubator environment in the study specifically works with green entrepreneurs. Four business developers from these incubator environments have been interviewed for this research project and function as representatives for the way incubator environments currently support sustainable entrepreneurship and competence development amongst aspiring sustainable entrepreneurs.

Qualitative interviews as empirical material

A total of 19 informants have been interviewed for this research project. These interviews make up the empirical material for the qualitative study. The informant base is comprised of 10 students, five educators and four counsellors. The interviews are conducted in accordance with a structured interview guide that allows for follow-up questions. The interview guide is constructed around open-ended questions about competences within sustainable entrepreneurship that the students gain through the educational and incubator environments that are part of the research project (see Appendix). The interviews are conducted online between the 18th of October and 24th of November 2021. Informants quoted are anonymised and referred to by professional title (student, educator or advisor) and the educational or competence developing environment they represent (natural science, technical/natural science, health, humanities or incubator environment).

ANALYSIS

We have focused on three themes in our analysis. Despite the relatively confined scope of the study, it nevertheless embraces a heterogenous group of respondents, which makes presentation of the results complex. In order to make the analysis as reader friendly as possible, we have limited the extent of our comments and analytical considerations in the following analysis. Since the perspectives from students and educators are naturally connected, we will not separate these. The perspectives from business developers are presented last, as they are not integrated in the curricula in the same way.

Theme 1: Design and structure

The courses represent a breadth of scientific disciplines: from the humanities to technical/natural, natural- and health science disciplines. The teaching is planned with several types of educational elements and comprises theoretical teaching and guest lectures from agents who are involved in sustainable entrepreneurship. Characteristic for all the courses is that they have integrated a practical dimension, where students try out and acquire competences within sustainable entrepreneurship. The students typically test their competences through project- or group work. Three of these courses are designed so that the students themselves define their own project inspired by a string of introductory lectures about either UN's Global Goals or "mega trends". Concurrently with the students developing a project or case, they are taught entrepreneurship and innovation, during which some of them likewise receive ongoing sparring and guidance about their specific cases.

By far the most commonly used method is design thinking (Berglund et al., 2020; Brown, 2008). According to the educators who used design thinking, this method is well suited to their teachings as it is both a theoretical approach and a methodical tool for designing solutions to complex problems. Furthermore, it takes an *empathetic point of departure*, in which the innovator places themselves in the problem holder's shoes. Two educators from the technical/natural and natural science studies are of the perception that behind sustainable entrepreneurship and earlier forms of entrepreneurship, lies the same methodical approach, which can, for example, be design thinking. According to the educators, sustainable entrepreneurship is present in the early creative phase, where the problem has to be defined - for example, it might be defined in light of the UN's Global Goals, and lead to the development of a likewise sustainable solution. One of these courses explicitly draws on the UN's Global Goals and design thinking:

"In design thinking, the first thing you do is define the problem. In the process of defining the problem, you gain knowledge and you reflect on this knowledge. You typically start with an observation and you have a lot of assumptions as to what the problem is. Then you test, explore and gather information and data. Next, you narrow it down to a specific problem. For example, there might be 20 different problems you can define by the observation you've made, but they're somehow interwoven. Here, you have to narrow it down to one specific problem that can be solved. And when you enter that phase, the solutions multiply as well. (...) So it's a back-and-forth way of learning."
(educator, technical/natural science)

Planning teaching with the UN's Global Goals as an explicit point of departure is intended to not only let the students work specifically with sustainability problems, but also to create intentional creative challenges, as science shows that creativity is heightened by this:

"We give them (the students) some boundaries. You know, there is also research that proves that creativity works best when there is a certain level of boundaries. Where you have no boundaries at all, people cannot focus. You just, like, fly around. If you have too much boundary, you're very constrained, then you cannot create stuff. So there was a sweet spot where you have to provide a certain level of boundaries. Then they will be forced to navigate within these boundaries, and then creativity that will be quite interesting, will pop up. So I think that giving them the context of the SDG's, if they see these 17 different goals and have a good overview, has helped them have kind of a conscious understanding of the boundary here. Of what is to be created, a good business or a bad business. Not in financial terms, but in terms of the moral standard." (educator, technical/natural science)

In a course within the health science discipline, they have a human-centred approach, but emphasise a hands-on and pragmatic approach:

“The course is very practical, hands on. The students have to develop their own venture idea, and then we go through a number of different themes they have to relate to their venture. It’s built on [name of scientist] design approach, which structures the course. And it is also based around an effectuation theory. Meaning, for instance, the idea of focusing on what resources you have available, rather than focusing on the goal.” (educator, health)

One of the courses is structured so that the students, alongside individual internships, receive theoretical education within entrepreneurship and innovation with an additional focus on enacting change within sustainability. The methodical basis for the teaching in this course is problem-based learning (PBL). Here, they have developed the term “Entrepreneurial PBL”, which combines the problem-oriented methodical approach with entrepreneurship as a thematic framework:

“We include that problem-oriented teaching, where you have to be aware of what perspective you apply to the case, and what consequences your choice of literature and theory have. And then the entrepreneurial come in, in that you explore your assumptions, and actually try and experiment together with other people and discuss it, and in that way interact with your surroundings. What is really central to the whole thing is that you test and relate it to some real situations and real people. (...) So how can the students become aware of how other people address a transformation process, how people experience a situation and then understand their situation, which is a prerequisite to making sensible changes. (...) Otherwise, I don’t think they can create value for other people.” (educator, humanities)

A course, which is offered on a technical/natural science master’s degree, is especially distinguishable from the other courses which are part of the research project. The course is founded on actual partnerships with organisations outside of the university and with separate funding for this course. Private, as well as public organisations, apply to be accepted to the course as a “case”. From here, the university combines groups of students based on their professional diversity. The groups are then assigned a suitable case with a private or a public organisation, where they have to work to develop solutions and business models in cooperation with the organisation. Concurrently, the students receive education and guidance from a mentor, and additionally, they receive 10.000 DKK to develop a prototype when developing the case. According to the students from this course, it varies whether the cases that are part of the course are defined openly, abstract or more concretely beforehand. A student with a technical master’s degree has been assigned an “abstract case”, where a large company wishes to get a foothold within the wind industry, based on a further development on their existing products, which are currently sold in a different market:

“We’re working with a large company that develops this product (anonymised), that right now is very much within another industry, and they really want to get into the wind industry. So they come to us

and say “we develop these products (anonymised), can you somehow get us into the wind industry?” And from there we’ve kind of started analysing, what exactly there is within the wind industry that has anything to do with their products. Then we’ve tried analysing, where the future for the wind industry lies, and where they as a company can jump in. So we’re making a joint venture with them, where we develop a new product (anonymised), which we see in 5-10 years dominating the market. And then we’ll already be ready with just such a product for them.” (student, technical/natural science)

The students, via their educational background within the technical, natural and health science disciplines, typically already have extensive knowledge of sustainability challenges. Furthermore, the students from technical/natural sciences education, study in places where the physical environment also promotes the UN’s Global Goals. That’s why, in a course from a natural science education, the main focus is that the students gain competences within entrepreneurship, innovation and creativity:

“Our course is not about whether they understand the complexity in working with sustainability principles. It’s about them understanding innovation processes, creative processes, and being able to organise them.” (educator, natural science/health)

The Global Goals are evident in the way educators understand sustainability, and they typically play a central role in planning the courses. In one course, the educators take the UN’s Global Goals as an explicit point of departure, where the students are tasked with developing a product based on these, including the underlying targets for each Goal, ideally in combination. An example from this course is a group of students who have combined more than one Global Goal by creating a business model that offers training modules for people with disabilities. Within the company, a culture is fostered that can create empowerment for people with disabilities, improve their lifestyle and welfare, as well as contribute to increasing equality by training competences that match job market requirements.

In the courses aimed at students from natural sciences and health, the UN’s Global Goals are employed more indirectly, in that the students are introduced to “mega trends” in society and on a global scale. These mega trends include subjects such as sustainability, climate change, Ageing Society, urbanisation, health, etc. The students are briefly introduced to sustainable business models, but due to the length and resources of the course, the main focus is on these mega trends and general innovation and entrepreneurial competences. The educator is, however, still aware of the importance of the Global Goals:

"[...] it makes sense, in relation to different types of stakeholders, that you relate your venture to the Global Goals. For example, in relation to the bigger ones, which are increasingly aware of it and look out for, whether and how a given venture relates to differences in Global Goals." (educator, health)

Theme 2: How sustainable entrepreneurship is understood

Characteristically for the majority of students, educators, and advisors in the study is that the term 'sustainable entrepreneurship' is new to them. When asked what they associate with sustainable entrepreneurship, the interviewees give a range of guesses as to how to define or practice sustainable entrepreneurship:

"In relation to the 17 Global Goals, we have to think of a future that doesn't impair opportunities for future generations. That's why co-responsibility for, or with others, when it comes to your choice of action is enormously important, and that's why you get this ethical dimension, too. It must be a bit hard to be creating value entrepreneurially and at the same time destroy possibilities for future generations by contributing to them having less health, less equality and education. So in that sense, there's a sort of critical constructive dimension to our understanding of entrepreneurship in the form of a sustainability perspective." (educator, humanities)

Another educator from a natural science discipline also points out that sustainable entrepreneurship, unlike previous types of entrepreneurship, is distinguished by a sense of urgency around solving challenges within sustainability, which, by their very definition, are often quite complex, while at the same time having to think of the long term in when it comes to the solutions. An obligatory course offered on a humanities master's degree has integrated an interdisciplinary dimension using teaching elements from a master's degree in applied philosophy. The aim of integrating an interdisciplinary dimension is, among other things, to have the students develop competences in taking a critical stance towards the ethical aspects of change enactment within sustainability, which arise as a result from entrepreneurship and innovation in the field. Here, there is added attention on the Global Goals, but they work more specifically with a model for sustainability as well as concepts such as 'world citizens' and 'irreplaceability':

"In relation to sustainability, we use a model; the economic dimension, social dimension and ethical dimension has to be fulfilled before you can say that it is sustainability. And it has to be a sustainability that doesn't happen at the expense of for example inequality or equity. For there to be sustainability, it has to be based on inclusion of the affected, they have to be considered in the situation in question [...] Sustainability is tied to not harming the ability of future generations to have their needs met, and the ethical dimension inherent in that, we actually emphasise that a lot, being co-responsible to those who haven't been born yet, really. [...] We might be able to make quotas that can be sold and traded, but there's also something irreplaceable in animals and special animal

species, so that irreplaceability cannot be compensated for just by creating quotas, so there's an essence in that." (educator, humanities)

These statements clearly show that the normative competence is central to these educators, and that their teaching focuses on giving the students competences in taking a critical stance to their own and others' business. This is also reflected in the students' understanding of sustainable entrepreneurship, but many see the ethical dimension as a natural component of all entrepreneurship:

"It's difficult to attach the sustainability concept to the entrepreneurial concept, because I also struggle to imagine an entrepreneur who does the opposite of what's sustainable. How do you break through by doing development work, starting new initiatives, being an inventor and putting things into practice, if there isn't a focus on sustainability. It might not be accepted in the same way, so it would also be difficult to not consider sustainability in it. So sustainable entrepreneurship, that must be, sort of, a double up focus on the sustainable." (student, humanities)

Some teachers and students also consider system thinking an important aspect of sustainable entrepreneurship:

"The idea of system thinking is more important when it comes to sustainable entrepreneurship. Because it's not sufficient to understand whether it gives an [economic] return or not, it is also necessary to understand what the different directly and indirectly derived environmental and social effects of our business model is. (...) Of course, it is still important to focus on whether this is economically sustainable or not. Otherwise there won't be any positive social or environmental effects longer term, if the company cannot survive. But it's obvious that it (sustainable entrepreneurship) necessitates other requirements in order to understand the social and environmental effects." (educator, health)

"If it's relevant, here's my take, just based on my education, in terms of what sustainability [as a focus] has given me, it's this new way of thinking, that our focus is not that there's a problem, and then we create a solution and then we make money off the profit. Instead we focus more on, here we have a system, and then we take a slightly broader perspective on things, meaning where we can optimise and how we can do it more efficiently, so we can make money. So, this new way is, where do we place the solution, rather than just where is there a problem and then [develop a] solution to it, it now becomes more about looking at the system." (student, technical/natural science)

Continuing on from this system thinking, some of the students' entrepreneurial projects focus on sustainability problems that are based on prospects that are far into the future, which current industrial agents struggle to take care of:

“The major energy companies can’t seem to get into the game and ask for money to establish new green energy plants (...). The problem is, though, that there are a handful of companies in Denmark that are so big that they plan their energy usage 10 years into the future. That’s what it takes to get such an agreement. So what (anonymised student 1) and (anonymised student 2) are doing, is that they create synthetic companies out of small and medium sized companies that wish to purchase green energy, but cannot commit on a 10 year scale. They then pool the companies together, and then they make a 10 year agreement instead. That way you can make green energy, and more green energy, because more people have a chance to buy it. So that is really making a difference in the world, also for the people who normally can’t be a part of this.” (educator, technical/natural science)

Educators emphasise that the students are part of a generation which is generally concerned with the climate agenda on a personal level, but that they also, via their secondary education, have already been introduced to the Global Goals. That being said, the majority of students, regardless of educational field, first and foremost associate sustainable entrepreneurship with a focus on climate:

“Entrepreneurship is a very, very broad field, and now you bring in this new invention and have that put into use out in the world, so it must be something like, where you think of a use or reuse and use of resources that aren’t used. (...) So to me, there’s connotations with green transition and resource use - and a lot of connotations with the environment.” (student, humanities)

This obvious association with climate, recycling and circular economy can make it difficult for educators to their students, e.g. from humanities educations, to see how sustainability, including sustainable entrepreneurship, relates to their profession:

“Actually, it’s been a challenge to introduce sustainability, because apparently the students largely couldn’t understand why they had to work with sustainability, and they saw sustainability in many ways as just a question of sorting and handling trash. I was a bit surprised to learn that they just didn’t think it was important for them to work with sustainability.” (educator, humanities)

Despite many students equating sustainability with a focus on climate challenges, the act of focusing on taking a critical and ethical stance, and on system thinking, leads to students viewing sustainable entrepreneurship as a “brand new mindset”. Rather than creating completely new solutions, sustainable entrepreneurship might for example be about reinventing or rethinking solutions that already exist:

“To me, it looks like a completely new way of thinking. That before, we would solve problems by saying, this is a specific problem, how many resources do we have to throw into it to solve it. Whereas now, you’re starting to think more in terms of, now we have a good platform and many of the problems we have, have been solved, so we’re starting to reinvent ourselves and solutions to old

problems (...) So a kind of new challenge, I'd say, and a new way of thinking." (student, technical/natural science)

It is interesting to see that most students clearly see the benefits of focusing on sustainability. However, sustainability is still seen as something that limits the potential for profit. In their understanding, it is the current major institutional focus on sustainability that creates the possibilities for sustainable entrepreneurship, rather than the fact that there actually are unexplored market opportunities for sustainable solutions:

"Sustainability hasn't been a hindrance as such, it's more that we know that there is a lot of money to be made if we make this sustainable. It's really good branding. However a lot of the sustainable solutions we want to make aren't profitable. So it's less the sustainability that is in the way, it's a bonus. If you can label your company as sustainable, it looks even better. And there are a lot of sustainability challenges that could be opportunities for businesses, but on the other hand: Is there enough profit in it?" (student, technical/natural science)

The incubator environments

The three incubator environments reflect three quite clear approaches to sustainable entrepreneurship: "Triple bottom line", "Just climate" and "Preferably not". What they have in common is that this is new to them, and that they are still navigating and finding their way through it. The incubator with a focus on triple bottom line has a clear ambition of being able to offer advice on the subject, but haven't yet found a good model to use when advising the students:

"It's actually also an area where it can be a bit difficult to find models that really suit the students in start-ups that we have here. I mean, we're still looking and we're very open and want to hear what's out there, so we're ready to take something on board. But until now we've not really landed on anything which we feel is a really good supplement model that illustrates how to incorporate sustainability into the business. (...) What we're trying to be careful with, is also to not be too theoretical, I mean we also want to illustrate something bound in reality, to show that we're the link between the theoretical university world and the market." (advisor, incubator environment)

However, it does appear that this is a clear strategy for them, and something they want to work to improve, and they have planned a summer school teaching the subject:

"One of the components in this larger project is about sustainability and entrepreneurship. So you can say that, of course it's these here-and-there initiatives, but we also want to make it a bit more organised and a bit more strategic, how we want to work with sustainability. And we will definitely get there, we're not there yet, but we're getting there." (advisor, incubator environment)

The incubator environment which we have categorised as “Just climate” is particularly focused on ‘green entrepreneurship’, including the environmental dimension within sustainable entrepreneurship. They use a broad definition of green entrepreneurship and do not include any specific requirements or clear boundaries:

“That it makes a green difference to consumers, companies, organisations, and that could be in a lot of different ways. Use of needs, better use of the resources, use less resources, reuse resources. So, sharing economy, circular products, bringing down CO2 in some way or another. It can be within communication and technology, or development of products. It’s very broad.” (advisor, incubator environment)

Since this incubator environment is in a startup phase, they currently haven’t developed any specific parameters as to when a startup looking for counselling with them can be seen as ‘green’. However, as a rule, a startup is ‘green’ if the product manages to lower CO2, and if the business model is solid enough to support this purpose. The advisor elaborates:

“We have softened it up a bit and have invited somewhat newer [startups] as well. But we have a group that does sell and that has some functioning business models, and that also has a product that somehow manages to successfully lower CO2. And we haven’t exactly defined that success yet.” (advisor, incubator environment)

At another incubator environment, which is also associated with a university, there is no explicit sparring about sustainable entrepreneurship. Here, sustainable entrepreneurship is mainly associated with wanting to ‘save the world’, following the UN’s Global Goals. The incubator environments try and advise the students within the theme in the cases where they themselves are driven by it:

“We have some here with the purpose that they want to save the world. I mean, that it’s number 1 [for them]. We have to help water projects in Bangladesh, we have to make clothes out of reused resources, we have to minimise resource usage - where that is what’s driving them. (...) It’s a growing development, we see more and more of them, and I’d say that all of them at some point are imprinted with the SDG’s, use them and look towards them. But where it’s not the primary driver. (...) We try [to advise them on the subject]. (...) But there are also some students who do a cross in front of their hearts when they hear the words SDG’s and they go “oh no, that again?”. We’ve talked about it in high school, we hear about it all the time, and it’s such a natural thing, like, “show it, don’t tell it”. So it’s just there like background music or an underlying theme. And if we (incubators) [actively] bring it up, that sucks.” (advisor, incubator environment)

In this incubator, the counsellors emphasise particularly the economic dimension of creating a sustainable business model:

“But those that try and save the world, when it comes to sustainability, also financial sustainability, they also want to save the world, and they’ll also almost [do it] without getting paid for it. But it’s a really big discussion that we have with them that, if you can’t make money from this, you can’t keep doing it. So when we talk about sustainability, it’s also about talking to them about financial sustainability.” (advisor, incubator environment)

Amongst the incubator environments, the potential in focusing on sustainability is seen as something stemming from the current institutional climate, rather than something that in itself has a noticeable market potential. An advisor from an incubator environment that doesn’t specifically focus on sustainable entrepreneurship, sees that entrepreneurs and start-ups are forced to consider sustainability in their business models in light of the feedback they receive from the world around them. This could for example be in relation to pitch competitions, financing processes, and in generating capital. Entrepreneurs and start-ups, whose product does not in itself have to do with sustainability, are often forced to consider sustainability anyway:

“It’s not necessarily that their start-up is based on a sustainability problem, if you can put it that way, or that they directly solve a problem relating to sustainability. But they might integrate it while they work with this start-up and try to find arguments for why this also has a sustainable dimension and why it might work on those premises. (...) I think that’s also very much connected to the fact that the start-ups that are part of the ecosystems as such, or outside of (anonymised name of incubator) are confronted with the fact that this is a question that will come up every once in a while, e.g. in pitch competitions or in different application processes, e.g. “how will you relate to these questions”. And for that reason it becomes more and more integrated. So it’s also an outside influence, that they [the students] start to see that this is something they have to consider.” (advisor, incubator environment)

Theme 3: Challenges, competences and learning

Through the practical dimension in the courses, the students have experienced different types of challenges in the processes of testing and gaining competences within sustainable entrepreneurship. The students often refer to competences connected to developing sustainable business models, and the challenge of making these financially sustainable. Which elements that have been challenging vary according to which professional and personal competences the students possessed before the course began. The most frequently occurring challenge mentioned is co-working challenges, which is quite typical for courses based on group work. When it comes to sustainable entrepreneurship, however, the co-working challenge is how to succeed in getting the functional diversity to work well:

“We [in the group] have such different professional skills, there are just completely different opinions of what is possible, and what is interesting to work with. So just sitting down and trying to say, well, what is it that you want, and how can we make that happen, and how can it align with what the rest of the team wants. Like, how do we get everyone working towards the same goal - both external partners and the team. To me, that was a big challenge.” (student, technical/natural science)

“I’m used to working alone and having everything inside my head, and I know exactly how I want things to look. With these types of courses it’s a requirement that you work in groups (...) You have to work together on so many things, and it’s impossible to be an expert in all fields, so you need other people, and that’s just not how I’m used to thinking. When we do these types of assignments, the primary idea is based on several brains. (...) There are a lot of people involved in the creation process, so it’s quite difficult. There’s a lot of trust involved.” (student, technical/natural science)

Educators, however, see the focus on sustainability and entrepreneurship as a good way to work with different disciplines, to get the students to engage different talents, to get them to understand the advantages of diversity and of working with different expectations from external partners:

“They [the students] can easily fall in love with technology, especially if they think it’s exciting, and they do. But [you have to] always keep in mind why we do what we do. And in that way, I actually think that there’s a perspective on sustainability that’s enormously relevant and exciting, when we start to look at, why are we doing this, what difference are we making when we do this. (...) and who are the people that this creates value for.” (educator, technical/natural science)

Different expectations from external partners is a dimension that some students have not experienced before and struggle to work with:

“I also think our biggest challenge has been to coordinate expectations, both within your team, but also with the external partners you have. We had our partner company (anonymised) coming in, and what they really just wanted was to get a market report about where they could sell their current products - whereas we wanted to build a company.” (student, technical/natural science)

This was experienced as especially tough when there was a lot at risk, and there were several organisations involved. Finding entry points and getting access to the relevant agents requires that you really use your network, which can be especially difficult for students since that is often not something they are used to doing, and most are typically at an age where they still have limited company contacts:

“Closed doors. The problem with our solution is that when we go to (authority’s digital platform number 1) and to (authority’s digital platform number 2), it’s a really high goal. It means we have to talk to (anonymised authority 1) and (anonymised authority 2) and then say that we’re going out to

“the big guns”. And if we go there as six students from (anonymised university) and say: “Hey, we have a project, we want to talk to you”, then they’ll say “Well, we’re too busy”. So you have to know someone who knows someone who knows someone in order to get in. And we have one shot, meaning that we really have to be ready with an idea, business model, and how we can help them and what we offer. So we have one shot with (anonymised authority 3), we have one shot with (anonymised authority 2), and so we just have to be ready. (...) So network is so very important in the start-up world, especially in the beginning.” (student, technical/natural science)

Educators also identified time constraints as a central problem. The students often don’t have time to test their projects and cases as to how they actually contribute to sustainability, and how a business is actually carried out, which can feel unfulfilled. Several educators also highlight the complexity in sustainability problems as a challenge that the students face via the practical dimension where they work with developing projects and cases. Students want to tick off several sustainability parameters, but that can prove challenging to fulfil in practice:

“We’ve had several groups that have been interested in consumer choices, especially in relation to retail. How you help consumers make more sustainable choices. The type of problems that are super important and significant. But where they face a challenge (...) [is when they] then have to operationalise sustainable choices. (...) And then it either becomes a transition which is scaled down to, so now we have a very narrow focus on organic choices. Organic produce etc. is more sustainable than the conventional choices, but it is not in itself a sign that something is sustainable, that for instance organic blueberries are flown in from Chile. That’s kind of where the complexity becomes difficult for the students to handle. And that’s completely reasonable, because that complexity would be just as difficult to handle out in the real world when you start a business today, (...) and creating a clear overview for the consumer about what’s the sustainable solution, and what’s not a sustainable solution. (...) They [the students] come with the ambition that it has to be climate footprint, it has to be working conditions, it has to be water usage, and it has to be all sorts of things. But how exactly do you fit that into one solution? Yeah, that’s hard.” (educator, natural science/health)

It is interesting to see that the students, who have just gained a sense of how to work with sustainability, get more opportunities to use this and to function as sense-givers in relation to other people:

“I’ve also interviewed my team leader out there [in the internship] now, to hear what considerations they’ve had, and there were not really any [considerations] and they had never heard of the UN’s Global Goals. So that’s like “well, well” (laughs), I mean, they’ve heard about it, but not in relation to the company. So that’s a bit of a challenge (...) Now, they’re also these really typical (anonymised Danish region) companies, where it’s like cut to the chase, and not so much bullshit-type of thing. So they [the internship] are also like “well, so what could we do for green energy”, because they sit in

some office park: “well, we’re not the ones providing the electricity”, so that’s about what they can think of, if they were to try and think of anything.” (student, humanities)

Despite - or maybe because of - the challenges that come with the practice-oriented teaching, all the students that have taken part in this research project feel that they have gained new competences through the courses, and that they have expanded their horizons and scope of action. In addition to having gained professional competences within sustainability and entrepreneurship, several students mention that they have gained personal competences, too, via the university courses. Amongst those competences, confidence and a greater gumption in pursuing and creating opportunities within sustainable entrepreneurship, are mentioned:

“We can do more than we think we can. You often see that “well, we’re students, there’s so much we can’t do”, and so the fact that you’re forced to sit down and work with (anonymised company 1), and your (anonymised fellow student) work with (anonymised company 2), some quite big companies, and we actually have a lot to say when we’ve sat in those board meetings, where the companies have wanted something specific, and we’ve said “Well, that’s not what we want to do”. Even though we’re students, who haven’t even finished a master’s degree, we can say to these Ph.D.-types, that this isn’t how we’re going to do this. We have to do it another way. That gives you some courage, a sense of go-out-there-and-get-’em, and it’s made you realise that you actually can do something now.”
(student, technical/natural science)

A couple of students mention that having dealt with entrepreneurship, innovation and sustainable entrepreneurship throughout the courses have motivated them to continue on in that direction in their further studies, and even after finishing their degree. For example, a student from a humanities master’s degree explains how several guest speakers in the course served as an inspiration to pursue a student job relating to enacting sustainable change:

“I was, like, truly very inspired and I went home and applied for a student job that I’ve actually gotten, where I start on Tuesday. The job is to communicate the Global Goals in (anonymised) municipality, so I’ll be working there in their development and service department (...) So that’s kind of my starting point [for working with sustainability], and then I hope I can continue in that trajectory.” (student, humanities)

It is interesting that the courses give the students ample opportunity to make sense for themselves about what working with sustainability and sustainable entrepreneurship is, through working and interacting with others. The diversity of perspectives and concepts that influence this field are interpreted by the students when they are working with them in practice. Here, it becomes clear why there is so much focus on action in this field.

The educators, who have all included plenty of practical elements in their courses, do have different ambitions when it comes to whether the students start their own businesses. Some hope that the courses will directly motivate the students to start a business that works with sustainability, while other educators believe that the competences the students gain via the course can also be useful in other types of work contexts. With one educator from a technical/natural science education it is the ambition that the students create a company that they continue to develop after the course finishes:

“We constantly work to create the best structural conditions for these start-ups, so that there’s a greater chance that they can actually get out there and be sustainable from a business perspective. That they can actually get by, they can earn enough income that they’ll still be here tomorrow, making a difference, and that’s a part of it, too, if you look at sustainability with a broad definition, of what we’re really teaching them. How can you still be here tomorrow, so that you can continue doing good (...) Hopefully it’ll become more than a practice ground, hopefully it’ll be a starting point. That’s part of the point of it, that they have the opportunity to go straight out there and do something with it. Sometimes it takes a long time, it might take 10 years (...) but you can start your start-up journey with us. (...) I normally say that the difference between us and others, both courses and incubators, is that we build start-ups, the others augment start-ups or teach.” (educator, technical/natural science)

An educator from a technical/natural science degree believe that the competences, the students gain through the course, are also transferable in other work contexts:

“Taking part in this course and working in groups, learning these different methods, using them in real life projects that they create themselves, that’s where we train future (anonymised profession) to possess these qualities, which can be very useful. Whether they become entrepreneurs or not is not the point. They can work in small, medium or large companies and still work with innovative projects, so it’ll come in handy throughout their entire career.” (educator, technical/natural science)

“If any of the students here go out and help influence and orientate existing, larger players, in a more sustainable direction, that would be incredible. So I hope that happens.” (educator, health)

An educator from a humanities master’s degree highlights how, the fact that students from this professional discipline are taught elements concerning sustainable entrepreneurship, helps to open the students’ eyes to potential future job opportunities and to increase their employability. This is particularly important as the students come from a discipline that traditionally have faced structural unemployment. By hearing from guest lecturers, the students’ horizons are expanded in terms of how humanities graduates can work with sustainable transformation processes:

“We were made aware that the Evangelical-Lutheran Church in Denmark [*Folkekirken*] actually plays a significant role [in sustainability], and that they had taken on a new task in transitioning to sustainability. It was a surprise to us and to the students. It was enormously inspiring to hear the bishop explain how important the grave digger was in supporting the sustainable transition from the bottom up, by thinking differently about area planning in their projects. For instance, that means that you can pick up flowers on the church grounds, instead of having to go out and buy pre-cut flowers. So it’s kind of small scale, but it’s also really the bigger picture.” (educator, humanities)

With the students, it is clear that their ambitions vary. For some of the students, the experience has had a direct influence, for others it has rather changed how they see their future. A student from a technical/natural science master’s degree explains that the course in question has served as inspiration to change course from a more academic to a more business-oriented course based in innovation. In addition, several students mention that they, through the courses, have realised that they, using sustainable entrepreneurship, can be a part of ‘doing something good for the world’:

“A lot of people who work with sustainable technology, including us students, have a willingness to work with something that is sustainable, because that way we also feel that we’re doing something good for the world. There’s also the motivation that you have a choice between something sustainable and something not sustainable, so even if the profit is higher somewhere else, you would probably work towards something that is sustainable.” (student, technical/natural science).

A student from a health education is considering entrepreneurship, but in the future:

“I actually think it’s been really very exciting to work with someone you didn’t really know in advance, and who had the same interest, but just with ideas from (anonymised profession) and motivation (...) I don’t know if it’s something I’d try and do now, but we were told that what we had made was a good idea. So if you try and develop it in 5-ish years time. That could be kind of exciting.” (student, health)

One student explains how testing and gaining more competences within entrepreneurship and innovation has demystified it, and she has gained insight about herself. In her case it did, however, become clear that entrepreneurship is not something for her:

“I just think it confirmed for me that this is not the type of job I’d want. I mean, I think it’s a really interesting process, and I’m full of admiration for those who do it. But it only confirmed for me that I love having a job where I go to work, and then I go home and that’s it, that I probably couldn’t stand going through those phases that are a part of innovation, that there’s also a lot of betting involved, maybe you’ll succeed, maybe you won’t, maybe it’ll be 10 years before you succeed. But most of all, I think I learnt a lot and got a better insight when it comes to understanding that world, which I’ll

recognise in others later on - but it hasn't made me interested in pursuing it myself, at all." (student, health)

Besides new perspectives on sustainability, and what change enactment entails, the majority of students describe having gained competences in the economic dimension of creating a sustainable business model. Examples of this include gaining more knowledge of how the economic world works when it comes to running a sustainable business, and that it opens a lot of doors to private foundations and investments, if sustainability is part of the project. A student explains how failing and making mistakes in the process have given them more competences in creating a sustainable business model:

"I've also learnt that you can learn so, so much from your business being in deficit. And, and this has often been said, but I've not really seen examples of the fact that even if you don't come away from it with a company, you'll still learn a lot from it. One thing is to be told this again and again, but it's another thing to actually experience it." (student, technical/natural science)

DISCUSSION AND IMPLICATIONS

It is clear that sustainable entrepreneurship can be interpreted in many ways, and that to many of the interviewees in this research project, it is a new concept, the meaning of which is negotiated through interaction with the institutional systems and the signals they receive from the system. Interviewees often refer to different pedagogical models for active and explorative learning, and the UN's Sustainable Development Goals clearly play a role in teachings and in the entrepreneurial ecosystems. Competence frameworks and taxonomies for entrepreneurial and sustainable competences do not, however, seem to have a direct influence on how educators construct their educational goals, just as the students do not express, either, how various abilities are connected. It nonetheless remains clear that the students are equipped with these skills when they partake in education with a focus on sustainable entrepreneurship.

The students gain key competences for sustainable entrepreneurship

Through teaching methods that are closely aligned with practice, the students learn to cooperate with group members with different backgrounds and to navigate various demands from different external partners. They often stress that they have had to handle a lot of uncertainty throughout the entire process, and that they have learnt a whole lot about strategic and entrepreneurial competences, as well as system thinking. Just like the experts in the Delphi study (Brundiers et al., 2020), many of the teachers and students mention the ethical aspects as most central to sustainable entrepreneurship, even though many of them equate sustainability with climate, circular economy

and recycling. Strategic management competence, cooperation and system thinking can also be used to engage in unethical activities, so the ability to take a critical stance and consider the ethical dimensions, should be embedded in all of the other competences. The students never mention the foresighted thinking and creativity competences, but the competences are, according to the educators, integrated into the teachings, even if they are mentioned less frequently.

Working with competence frameworks

Since the students seem to have acquired the central competences for sustainable entrepreneurship, you could question the value that this type of competence framework adds. The educators seem to be able to create well balanced courses without these taxonomic classifications. It is of course valuable that the students can articulate clearly what skills they have exercised, and the clearer it is from the teachings, the easier it is for the students to articulate. In the same way that the UN's Sustainable Development Goals are clearly mediated, competences exercised could be illustrated in both lectures and teaching materials. An easy way to do this is to let the students evaluate their own competences. This type of self-evaluation could be based on the survey in the appendix, which is set up to generate simple personal competence reports that illustrate how students have developed. Another way to illustrate these competences is by, in cooperation with students, developing learning rubrics (e.g. not approved, approved, highly approved, etc.) for the different educational goals. The students can then be task with giving feedback on each other's projects based on these rubrics. Examples of this could be to assess the ethical aspects, or to what extent and how much systemic aspects are integrated, how much groups members have contributed to the group work, how external agents have been handled, etc.

View sustainability as a possibility

Even if both students and advisors in the incubator environments see many possibilities in working with issues of sustainability, it is first and foremost about getting the most out of the new focus which institutional agents have given the area, rather than about the business potential of sustainability in itself. According to Aldrich and Martinez (2015), entrepreneurs are generally not innovative, not even compared to established companies. They claim that this is due to the fact that entrepreneurs are more limited by institutional forces than established companies are, and that start-up teams are generally less diverse in their team composition when compared with established companies. But if we follow Aldrich and Martinez' explanations, we can identify many reasons why we can expect that entrepreneurship focused on sustainable solutions is more innovative than traditional entrepreneurship.

Since sustainable entrepreneurs work with issues of sustainability that are often a result of the institutional order, they have to challenge the system and the status quo (Isaak, 2010). According to Luhmann (1986), it is impossible for a society to react to problems before they become public using social communication systems. By challenging existing norms and institutional forces, the socialisation of the problems can be initiated, which is also a prerequisite for them being eliminated. This change in institutional climate leads to an increased institutional complexity. According to Aldrich and Martinez (2015), this creates opportunities for entrepreneurial possibilities, not just for those who initiated the change, but for everyone who knows how to navigate the new institutional climate. It normally takes collective action from producers, consumers and sustainable entrepreneurs to challenge the institutional order (Rodríguez-García et al., 2019). This means that sustainable entrepreneurs have to gather a large and diverse network and include many different approaches and perspectives (Parrish & Tilley, 2010). Since diversity is an important postulate for innovation, it is more likely that a diverse network, including both weaker and stronger ties, will cause creative entrepreneurial change.

Sustainability related market failures are also potential opportunities for profitable companies (Dean & McMullen, 2007). As public awareness about sustainability issues increases, so too, is there an increased focus on correcting these market failures. This makes them more profitable and suitable targets for sustainable entrepreneurs (Hockerts & Wüstenhagen, 2010). Sustainable entrepreneurship can also increasingly be expected to receive more diverse input from its target group and customer base. Since sustainable entrepreneurs generally have to focus on new solutions and new markets, their customers are most often early adopters with high standards. These early adopters are often eager to find and communicate possible improvements of products and services, and they often take part in global communities where new products, services and advancements are discussed based on different local contexts.

As such, there are many good reasons why policy makers can focus on sustainable entrepreneurship, if the goal is to increase society's innovation capacity and role in the global market. But for the individual entrepreneurs, there are also many business opportunities. It is therefore worrying to see that there are several students and advisors in the incubator environments, who view sustainable entrepreneurship as a "second class" innovation activity, and that its primary potential is that it gets extra support and attention from institutional agents. The incubators help the entrepreneurs that come to them with ideas for sustainable services and products, but we do not find that they work

proactively with sustainability issues and opportunities with the more traditional entrepreneurs. This is unfortunate, since sustainability, if it is to be seen as an opportunity rather than a burden, should be included early in the entrepreneurial process (Freimann et al., 2010).

Examples of clear methods and materials

A clear result of the research project was that many interviewees struggle with the scope and definition of sustainability and sustainable entrepreneurship, which makes it challenging for them to work within the field. This is maybe mainly relevant for the incubators that often want clear and thoroughly tested methods and models. The concepts and ideas that sustainable entrepreneurs bring to the incubators are often context specific and very different, which makes it problematic to try and fit them into simplistic templates and models, especially when it comes to measuring their “impact”. The “sustainable start-up canvas” is therefore not sufficient. Some educators in the study do not believe that there is more of a difference between sustainable entrepreneurs and “traditional” entrepreneurs than the focus that the students have in the initiating phase. According to them, methods such as design thinking are also appropriate here. It does seem, though, that incubator environments, with their frequent change of personnel, requests something more specific when it comes to sustainable entrepreneurship.

SELECTION AND LIMITATIONS

The results of this research project depend, of course, on our selection of interviewees. Our goal was to shed light on how educators from different disciplines currently experience teaching sustainable entrepreneurship as well as how this is reflected in their students’ experiences. Since the incubator environments also play an important role in entrepreneurship education, especially for the students, we chose to include them in our research project as well. This resulted in a very heterogeneous group, allowing us to gain wide-reaching insight into different educators’ work as well as into many different perspectives. Even though we have identified many differences between different specialties and educational contexts, they also have a lot in common when it comes to methods, educational goals, and competences. However, this wide-reaching research design has meant that we cannot gain a deeper knowledge on the subject. Even though we have had a peek under the surface and gained insight into what actually happens in practice at the universities, the strategic and communicative work only brought us as far as the top layers. If we want more insight into how educators make sense of the signals they receive internally and externally, we must follow them more closely and for a longer period of time.

CONCLUDING SUMMARY

The focus of this research project has been to gain insight into how educators make sense of the signals they receive, both internally and externally, about how to interpret and work with sustainable entrepreneurship in their education, as well as how this is practised, as explored through how students perceive their courses. Our analysis shows that it is experienced as something new and unknown to many students, and many equate it with a focus on climate challenges and technical solutions, rather than questions of justice and social inequality. Many interviewees do not believe that there is a great difference between traditional entrepreneurship and sustainable entrepreneurship, and that no matter the focus, the educational methods used could largely be the same. However, other interviewees call for methods that are more specifically adapted towards sustainable entrepreneurship.

Students clearly trained competences that have been identified as important to sustainable entrepreneurship, even though educators were not utilising the competence frameworks and taxonomies developed for the subject area. A framework which was frequently referred to was the UN's Sustainable Development Goals. In a short amount of time, this framework has had a great influence on education and the entrepreneurial ecosystems. We can learn a lot from the success of implementing this framework when working with implementing competence frameworks, such as GreenComp, on a broader scale.

Finally, it was clear that our interviewees felt that the focus the area currently gets was the main reason to why you as an entrepreneur should focus on it, along with “doing something good for the world”, rather than doing so because sustainable solutions have market potential in and of themselves. The focus on social and ecological sustainability is more often seen as a hindrance to economic sustainability. Herein lies a big task of getting students and future entrepreneurs to also see the economic potential in focusing on sustainability. This work should begin sooner rather than later, so the incubator environments will have a lot of work to do to work proactively with sustainability in start-ups, and not just advise those start-ups that are already “converted”.

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APPENDIX

Survey

1	What is the name of the course you have participated in?	
2	To what degree has there been a focus on sustainability in this course?	1- Not at all / 7 - To a high degree
3	Has the focus been mainly on social sustainability or ecological sustainability?	1- Mostly social sustainability / 7 - Mostly ecological sustainability
4	To what degree has there been a focus on working actively with developing projects in this course?	1- Not at all / 7 - To a high degree
5	To what degree has there been a focus on entrepreneurship in this course?	1- Not at all / 7 - To a high degree
6	Foresighted thinking competence: The ability to collectively analyse, evaluate, and craft 'pictures' of the future in which the impact of local and/or short-term decisions on environmental, social, and economic issues is viewed on a global/cosmopolitan scale and in the long term.	
	<i>I am able to...</i>	
6.1.	Construct and consider different directions for sustainability in the future	At the start of this course / Now - To a low degree / To a high degree
6.2.	Identify risks and opportunities inherent in present and future developments	At the start of this course / Now - To a low degree / To a high degree
6.3.	Consider both short- and long-term impact when evaluating scenarios for action	At the start of this course / Now - To a low degree / To a high degree
7	Systems thinking competence: The ability to identify and analyse all relevant (sub)systems across different domains (people, profit, planet) and disciplines, including their boundaries.	
	<i>I am able to...</i>	
7.1.	Identify key aspects of production chains and ecosystems	At the start of this course / Now - To a low degree / To a high degree
7.2.	Systematically integrate social, environmental, and societal issues into my plans	At the start of this course / Now - To a low degree / To a high degree
7.3.	Identify the key operations that have a negative impact on the environment or society	At the start of this course / Now - To a low degree / To a high degree
8	Interpersonal competence: The ability to motivate, enable, and facilitate collaborative and participatory sustainability activities	
	<i>I am able to...</i>	
8.1.	Make my team members feel seen and appreciated	At the start of this course / Now - To a low degree / To a high degree
8.2.	Reinforce my conviction to team members about issues that are important to me	At the start of this course / Now - To a low degree / To a high degree
8.3.	Judge the extent stakeholders are willing to collaborate in a project	At the start of this course / Now - To a low degree / To a high degree
9	Normative competence: The ability to map, apply, and reconcile sustainability values, principles, and targets with internal and external stakeholders, without embracing any given norm, but based on the good character of the one who is involved in sustainability issues.	
	<i>I am able to...</i>	
9.1.	Critically reflect upon what is viewed as "good sustainable practice" in my field of study	At the start of this course / Now - To a low degree / To a high degree
9.2.	Explain my thinking behind decisions concerning sustainability	At the start of this course / Now - To a low degree / To a high degree

9.3.	Apply norms, values, and principles of sustainability to my own practice	At the start of this course / Now - To a low degree / To a high degree
10	Diversity competence: The ability to structure relations, spot issues and recognize the legitimacy of other viewpoints.	
	<i>I am able to...</i>	
10.1.	Bring together economic, social and environmental conflicts of interest	At the start of this course / Now - To a low degree / To a high degree
10.2.	Use the experiences and values of various stakeholders in addressing sustainability issues	At the start of this course / Now - To a low degree / To a high degree
10.3.	Actively involve professionals from other disciplines in addressing sustainability issues	At the start of this course / Now - To a low degree / To a high degree
11	Strategic action competence: The ability to collectively design projects, implement interventions, transitions, and strategies, and translate these strategies to responsible actions for the improvement of the sustainability of social-ecological systems.	
	<i>I am able to...</i>	
11.1.	Challenge non sustainable ways of working	At the start of this course / Now - To a low degree / To a high degree
11.2.	Identify opportunities for sustainable development	At the start of this course / Now - To a low degree / To a high degree
11.3.	Identify how social and environmental challenges can be turned into opportunities for organizations/companies	At the start of this course / Now - To a low degree / To a high degree
11.4.	Involve the right people when it comes to achieving goals in sustainability projects	At the start of this course / Now - To a low degree / To a high degree
11.5.	Identify which steps to take to be successful in sustainability projects	At the start of this course / Now - To a low degree / To a high degree
11.6.	Use strategic ways of working in sustainability projects	At the start of this course / Now - To a low degree / To a high degree
12	I am...	Male / Female / Other
13	Overall, how satisfied are you with this course?	1-7 (Not at all / To a high degree)
14	Do you plan to continue to develop the idea/project that you have developed in this course?	Yes / No / I did not develop an idea/project in this course
15	Have any of your parents been self-employed?	
16	Would you describe yourself as a person that is engaged in...	
16.1.	Ecological movements	1=Not at all / 7=To a high degree
16.2.	Social justice movements	1=Not at all / 7=To a high degree
17	Creativity is about the development of ideas and solutions for already existing - and new challenges.	
	<i>I am able to...</i>	
17.1.	Come up with new ideas	At the start of this course / Now - To a low degree / To a high degree
17.2.	Combine ideas in a new way	At the start of this course / Now - To a low degree / To a high degree
17.3.	Build on the ideas of others	At the start of this course / Now - To a low degree / To a high degree
18	Managing uncertainty is about feeling comfortable with making decisions when the information available is partial or ambiguous or when the decision implies uncertain outcomes.	
	<i>I am able to...</i>	
18.1.	Deal with uncertainty when implementing new activities	At the start of this course / Now - To a low degree / To a high degree
18.2.	Work under stress and pressure	At the start of this course / Now - To a low degree / To a high degree

18.3.	Deal with sudden changes and surprises	At the start of this course / Now - To a low degree / To a high degree
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Interview guide - students

Purpose

- What competences have they gained
- How students have experienced the courses

Background information

Name:

Course:

Education:

Professional field:

University:

Focus on sustainability in the project? Yes/No:

Introduction

- Thanks for agreeing to talk to me
- Short description of the purpose of the research project and what will happen during the interview (time frame, subject)
- Consent: They have to have signed a consent form before the interview. Let them know when you press record, so they know they are being recorded

Could you start by telling me a bit about [name of course]?

- What is it about?
- If elective course: Why did you choose it? (motivation)
- What is your project about? (KU and DTU courses focus on developing a business idea or a product)

What do you think when you hear the words sustainable entrepreneurship?

What is the most important thing you've learnt on the course? What has made the biggest impression on you?

What has been the biggest challenge when it comes to developing a sustainable project?

Is there anything you had wanted to learn on the course? Anything that could have been done better?

Use of competences in the future

- How will you use what you have learnt (about sustainable entrepreneurship) on the course in the future?

Rounding off

- Thanks for taking part
- Do you have any questions for me (about the research project)?

Interview guide - educators

Purpose:

- Understand their ambition with their course design

Background information

Name:

Course:

Job title:

Professional field:

University:

Focus on sustainability in the project? Yes/No:

Introduction

- Thanks for agreeing to talk to me
- Short description of the purpose of the research project and what will happen during the interview (time frame, subject)
- Consent: They have to have signed a consent form before the interview. Let them know when you press record, so they know they are being recorded

Could you start by telling me a little bit about course X?

- Teaching method: how is teaching structured (project work, lectures, etc)?
- How does the course focus on sustainability? How do the students work with it?
- Who are the students? And what is their motivation for doing the course?

Did you develop the course?

- If yes, what was your motivation behind doing so?

Students' competences

- What are the most important competences the students need to have in order to develop solutions to sustainability related problems?
- Do the students need other types of knowledge and competences when working with sustainable entrepreneurship, rather than entrepreneurship without a sustainability focus?
- What do you hope the students will gain from taking part in your course?
- What are the students' main challenges when developing sustainable solutions to problems and businesses?

Rounding off

- Thanks for taking part
- Do you have any questions for me (about the research project)?

Interview guide - incubators**Purpose:**

- Gaining knowledge about what knowledge and competences new green entrepreneurs want
- Getting to know what incubator environments etc. do to accommodate them

Background information

Date:

Name of organisation:

Name of interview person:

Target group they work with:

Number of green entrepreneurs/startups they currently work with:

Introduction

- Thanks for agreeing to talk to me
- Short description of the purpose of the research project and what will happen during the interview (time frame, subject)
- Consent to the interview being recorded (if relevant)

Could you start by telling me a little bit about your hub/entrepreneur environment?

- Target group
- Do you have many students coming to you with green business ideas?

What help do young green entrepreneurs request when they come to you?

- Do they have other needs than entrepreneurs who do not have a green focus?

What do you do to help them?

- Courses, workshops, competence development, knowledge sharing, etc?
- Are there any other organisations you can refer them to, that specialises in green entrepreneurship?

Is there any knowledge or some competences that green entrepreneurs especially would benefit from learning during their studies?

Rounding off

- Is there anything you would like to add?
- Do you have any questions for me or about the research project?
- Thanks for your time