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# Alone in the sustainable wilderness; transforming sustainable competences and didactics in a design for change education

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## Abstract

According to UNESCO (2012) pedagogies associated with Educations for Sustainable Development (ESD) should spur and inspire students to think critically, ask questions and reflect. The assumption is, that pedagogies are moving towards student-centred participatory learning. Still, the educator is at the core of the transition towards developing ESD's, so changes of the educators' worldviews and practices are emerging. The educators' competences and knowledge on ESD-development becomes central as the question of the what and the how the students are taught becomes more pressing.

Today many sustainable educations still have a high focus on systemic issues (external systems); politics, technology, or socioeconomic structures (Parodi & Tamm, 2018, Wamsler, 2019) and lately the UNESCO (2021) has stressed the need for adapting cognitive, transformative, personal, emotional, dimensions of learning into ESD.

In a transformative learning setting the educators should provide real-heartfelt experiences generating the students with capacities to reflect critically on both systems and personal design practice methods and help them aligning their methods with their personal emotional values. In doing so, the educators feel left "alone in the Wilderness" and research in the personal dimension of sustainable transformation and connection of this to ESD's is scarce (Parodi & Tamm, 2018, Wamsler, 2019).

On this backdrop, this article provides a reflexive case study of a BA level course on "Design for Change" performed from 2019 – 2021 using transformative learning practices and the connected interventions in the form of a reflection tool, the Decoding Creativity Tool (DCT). The data was collected to discover if and how the students could enhance personal sustainable competences using transformative learning focusing on the personal emotional and creative development and awareness, reflection tools and "visiting" methods.

Implementing transformative learning and ESD's into educational practices requires radical revisions of the design education system, managerial strategic commitment and involves many levels of the HE's. It requires both internal and external collaborations for the design educations and could involve developing new didactics and methods where ideas can grow. (Barth & Rieckmann, 2012).

## Keywords

Design Education, Design for Social & Sustainable Innovation, Entrepreneurship, Design Didactics, Education for Sustainable Development

## Introduction

We are faced with an unprecedented and huge learning challenge at every level, in which educational policy and practice need to play a pivotal role. How do we 'reorient our systems of knowledge creation and education'? How do we ensure that education for these extraordinary times can manifest a culture of critical commitment—engaged enough to make a real difference to social–ecological resilience and sustainability but reflexively critical enough to learn from experience and to keep options open into the future? (Sterling, 2016, p. 212)

88% of the Danes think it highly important that young people receive proper and coherent education in how we as a society handle the climate challenge, according to a recent survey performed by the Climate Barometer 2020 (Thinktank Concito, 2021). With numerous initiatives forming over the years such as A Nordic Textile Strategy initiated by the Nordic Council for Ministers targeting increased collection, sorting, reuse and recycling, Global Fashion Agenda or Mistra Future Fashion research program from Mista and RISE Research Institute of Sweden, the intention is to bring together research, business and governments for a unified approach to accelerate the transition towards sustainable development and circularity in the fashion industry. However, little focus has been placed on the educational feature. As for Denmark, it ranked second in 2019 on the Eco-Innovation Index, an initiative of the European Commission aiming to measure and evaluate eco-innovation performance across the EU Member States at a research business' and policy level (European Commission 2021). But advancements are developing at a painfully slow pace as translating theory into practice is highly intricate and requires many iterations.

The Nordic Countries are often considered to be pioneers in the sustainability agenda and research provided by the international collaboration of design-schools "Fashion-Seeds, 2020, Education and Research, The Benchmarking Report" somehow confirms this position. With 17 publicly funded Higher Education Institutions (HEs) within the fashion and textiles disciplines, either deriving from design, engineering, business or arts and craft traditions many of these now have academic sustainability research and educational offers around ESD.

"Fashion Seeds, 2020" describes the development of sustainable curriculum in the Nordic countries; "To some HEIs it is still a challenge to integrate progressive learning of the subject within their full range of BA and MA programmes. … going from individual courses focusing on selected sustainability aspects to a more holistic and institutional perspective, in some cases supported, in others imposed by management." (Ræbild, Riisberg & Hasling, 2019, p. 61).

Even as the "Benchmarking Report" finds the level of teaching in ESD at the design-schools in the Nordic Countries well integrated, recent studies show huge gaps in the practice of the design-students in social, sustainable, and complex challenges. (Østergaard, T., 2018, Østergaard, 2019, Dan, M. C., & Østergaard, T., 2021) One of the leading design-didactics, Ken Friedmann, stresses that many European design-graduates finish their studies with a narrow concentration in design skills and lacks competencies to cope with the complex reality. (Friedman, K. 2019) In this way, what and how they are taught becomes essential. But it also becomes central if the educators have the right competencies and didactic understanding to teach the students sustainability competencies. (Sterling, 2001, UNESCO, 2017, Sleurs, 2008)

The call from outside for teaching ESD has created a variety of didactic approaches to teaching at HE's. It requires selecting decisions of cases, collaborating partners, didactics, and evaluation tools, which are all political choices made from the educators' perspective. Teaching sustainability is thereby fundamentally about how the educator perceive the reality and engage with or envision societal values. (Parodi and Tamm, 2018) In this way the use of learning theories which enables the student's ability to challenge their personal perceptions of the World through new ways of thinking and critically reflect on their learning process may differ in practice. But lately research indicates that "Transformative Learning" can be used as driver for sustainable change. (Illeris, 2014c, Vare, 2018, Mulà et al, 2017)

An example of the use of transformative learning principles in ESD can be found the Rounder Sense of Purpose-project (RSP). In 2019 the three-year EU-funded project RSP (working since 2015 to develop an accredited framework of sustainable competences) presented 12 key competencies for ESD. The project results showed twelve key competences of which three were especially highlighted. These three competences are the "basics" of sustainable competences and the report encourages educators to focus on developing the systemic, the critical and the anticipatory thinking competences. (Vare, 2018)

In this way, the RSP project stresses the importance of the educator having a critical understanding of sustainable development as well a profound grounding in the pedagogy of Education for Sustainable Development (ESD). The Rounder Sense of Purpose was designed to help educators find ways of using new didactic methods on one hand and at the same time making new contributions developing new methods. The RSP framework presents twelve educator competences as the basics in a learning process and a method to for educators to assess their ESD capabilities. Like the other reflective and transformative Decoding European Creative Skills project, (DECS) (Martinez-Villagrasa et al, 2018) each competence has several (three) learning outcomes and under these and underpinning components. As the project understands "teaching as an art" – these are presented on an interactive artists palette and by clicking on the competence you find a link to activities developed to enhance the specific competence. The RSP framework is presented in a matrix of 12 competences arranged in the same three columns as the UNECE framework: holistic approach, envisioning change and achieving transformation. The RSP competence-table proposes a progress which the educator could follow: (a) Integration—using knowledge from different dimensions, looking at interconnections and cause-effect relationships. (b) Involvement—building this understanding into their personal sense of commitment. (c) Practice—combining the two stages above in their practical work as an educator. (d) Reflection—evaluating the process and results of their work, assuming responsibility, and taking decisions before repeating the process in an iterative learning loop.

But overall, the RSP framework encourages educators to develop a transformative, action-oriented, pedagogy which will encourage the students in involving / participatory, creative, systemic, critical reflecting actions. (Vare, 2018). In order to understand the principles of developing sustainable competences in the DFC, the course will be analysed into the context of the principles and compared to the work with the Decoding Creativity-tool (DC-tool).

The Decoding European Creative Skills (DECS) project will be highlighted as another example and a practical tool for enhancing the students creative and sustainable competences. DECS

was a co-funded project by the Creative Europe Program of the European Union lead by ELISAVA, School of Design & Engineering together with Fachhochschule Salzburg University of Applied Sciences and Eindhoven University of Technology. The aim of the project has been the mapping and categorization of a variation of creative skills which defines the knowledge of present designers and designers-to-be. (Martinez-Villagrasa et al, 2018)

DECS poses questions on the 21'st century design student's competencies and the "gaps" discovered between the research findings and the wishes to encompass future social, technological and environ-mental challenges and presents the notion that creativity is a multidimensional construction connected to many other competencies and not an autonomous or isolated skill. The methodology identified a list of ten competencies and 20 dimensions of these, which have been used to create a radiograph on the model, -related to the creative process. In this regard the DECS project and the DC-tool will be analyzed in comparison with UNESCO's canonized eight competencies applied to the students in the DFC course. The DECS approach is used as an example out of many on how educators can make the students reflect on own competences, worldviews and future expectations and thereby support the student in his/her own personal development and performance.

In the DECS project, the researchers created "The Creative Competencies Dictionary" and thereby invited designers to self-reflection and insight into the practice and skills for design in the creative process giving the teachers of design and helping the students to understand or even improve their own creative competencies.

By adding the CDT and using the Dictionary as a theoretical backdrop the educators can have a tool to discover individual gaps and potentials of the students' competencies as well as their work behaviour and thereby providing a self-assessment tool for universities to use also in developing educations for specific sectors. To the Professionals the tools can be used to detect and work on the progression of improving competencies within the company, when hiring or developing employee-strategies and personal development tools. Finally, the DECS project and the CDT provides new knowledge – a common language (grammar and a dictionary) and research on the creative competencies of designers across disciplines and challenges across Europe.

Still, a definition of competences relies on an interlinked complex of knowledge, skills, and attitudes that enables the performance of successful tasks and problem solving. (Barth, et al. 2007, Rauch & Steiner, 2013, Rieckmann, 2018, Sterling, S., 2016, UNESCO, 2021). The ESD discourse has presented eight key competencies of particular importance for thinking and acting in favour of sustainable development: 1. Systems thinking competency, 2. Anticipatory competency, 3. Normative competency, 4. Strategic competency, 5. Collaboration competency, 6. Critical thinking competency, 7. Self-awareness competency, 8. Integrated problem-solving competency. (Rieckmann, 2018, Sterling, 2001) If ESD courses and elements are only defined by lecturers it is still very unlikely students will feel the urge of commitment to work on SDG challenges, research shows. Didactic approaches to ESD reflect the latest trends in trying to develop "participatory" or "democratic" approaches combining active student involvement with empowerment (Barth et al. 2007, Mezirow, 2009, Østergaard, 2019).

As such, the DECS project, provides a vocabulary, a method for construing the 10 competencies and a relatively non-curricular informal tool for a continuing personal development proposes

elements of the informal, “experiential learning” - developing a life competency - using intellectual, sensory as well as emotional responses in the assessment of the individual and the group in the process.

As the DCT provides a method to reflect on earlier experiences and the individual evolution of competencies. But as the vocabulary and the DCT-tool is a mixture of both knowledge based and experiential learning methodology it doesn’t quite meet the sustainability focused standards of the eight UNESCO competencies.

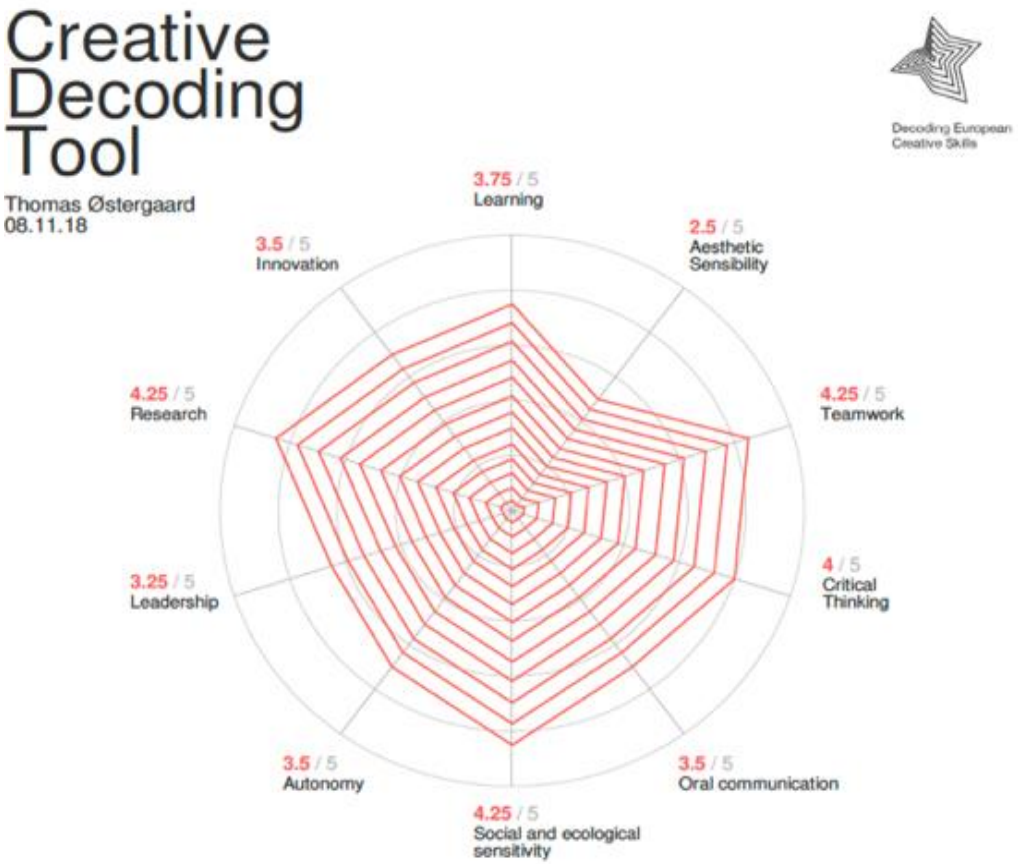


***Figure 1; The radiograph on the behavioural models related to the creative process from the DCT applied.***

On the other hand, as the DCT tool is a powerful competency development facilitator, it suggests a useful combination or use of the “regular” design competencies, such as “Learning”, (curiosity + knowledge internalization), Critical Thinking, (questioning + proposing), Oral Communication, (planning + charisma) Autonomy, (self-management + initiative) and of course Social and Ecological Sensitivity, (awareness + compromise) in a sustainability context. In a SE view, the DCT tool could help enhance the design-students self-awareness in relation to the UNESCO proposed competencies and add aesthetics and material-knowledge and science to the ESD competencies.

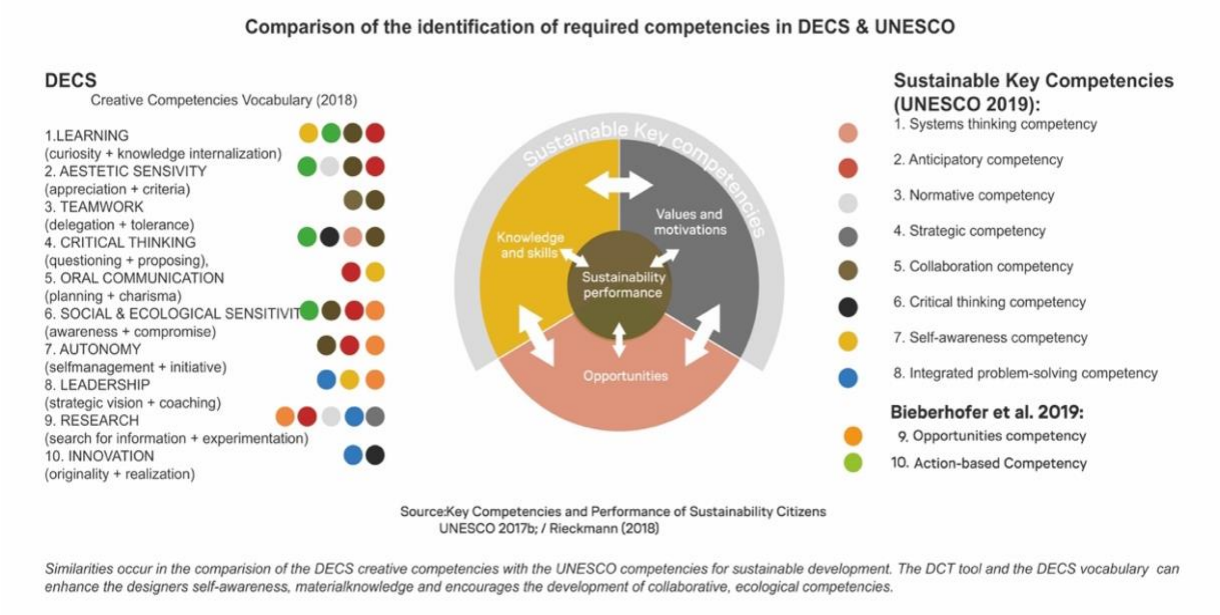


***Figure 2; Comparison of the identification of required competencies according to DECS & UNESCO***

The process of working with the development of the DFC course and the data gathered in interviews and surveys generated an opportunity to pose and respond the following question:

RQ1. Did participating in this course using the DCT Tool encourage a shift in the way students view their personal sustainable competences and possibilities in the industry and its systems? If so, in what way?

As the question has been the basis of the data analysis process, in helping to understand the experiences of the students surveyed it did not comply to the wish of investigating the role of the educator in transformative ESD. As a result, an additional secondary empirical literature review and research question was framed:

RQ2. How can design educators integrate transformative teaching strategies to encourage a shift in the way students view the sustainable future of their practice?

RQ3. How does the DFC course comply to the expectations of the educators sustainable competences and practices using transformative learning (RSP) in order to enhance the students' outcomes and learnings?

**Findings**

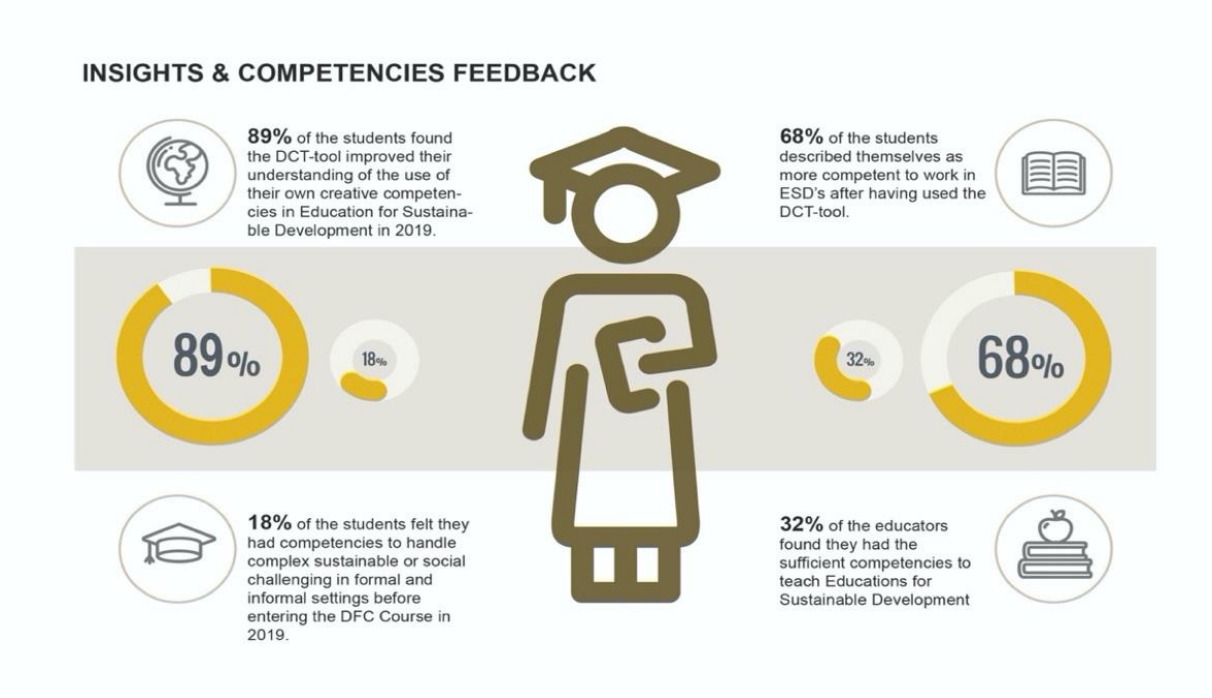


***Figure 3; The findings and insights of the surveys***

## Methodology

This article uses data from two R&D projects, from 2019-2021; DECS and the Design for Change Course (DFC) at VIA Design, Denmark and research performed during the Decoding European Creative Skills project (DECS), adapted to the DFC Course in 2019-2021. As a result of the authors participation as an affiliated researcher in the DECS-program, from 2019-2021, the course integrated the use of the Decoding Creativity Tool and adapted the methodology and didactics of the Rounder Sense Purpose (RSP) (transformative sustainable learning) model and performed new semi-structured interviews and collected data from the course.

The study thus uses a mixed sequential method that combines the quantitative (studies) with semi-structured interviews - as qualitative research methods. (Lund, 2012, Silverman, 2014). The data analysis was performed in three phases. First, a survey was sent to 37 students of which 22 responded. Secondly a survey was sent to 30 educators at VIA Design & Business of whom 25 responded. As the studies mainly contained open-ended questions, the analysis was conducted through qualitative content analysis, where common themes were identified and coded. In the third phase of the sequential study strategy (Lund, 2012) nine semi-structured in-depth interviews were conducted with students who have completed the course using the DCT tool. Data was analyzed through thematic analysis (clustering), which made it possible to identify common and / or varying patterns in the responses.

The results of the interviews were then compared with the results of the study. For the DFC project, both qualitative and quantitative methods have been used and combined in this way to address both exploratory hypothesis generating questions and hypothesis confirmatory test questions. [27] The results can become complementary, providing a better framework for interpretation of the research area. The Qualitative data collection (semi structured interviews)

consisted of 9 open in-depth interviews with students about their views on their personal sustainable competencies before entering the course, how the use of their creative competences could benefit their knowledge about sustainability and finally if the use of the DCT tool had changed their self-perception as capable of creating sustainable impacts.

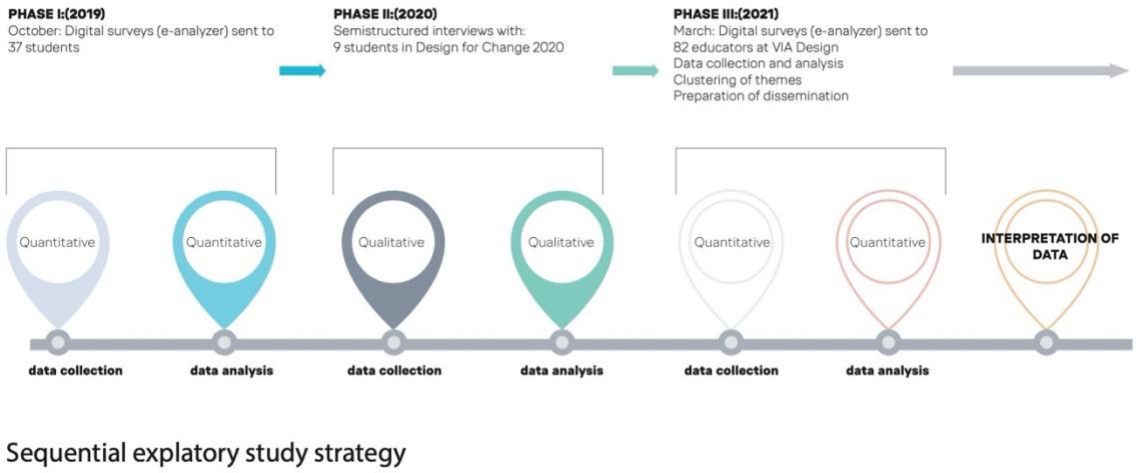


***Figure 4: Timeline of the Sequential Exploratory Study, (Lund, 2012).***

To bring knowledge on how the educators at VIA Design performs in ESD, a survey has been made to the educators at VIA Design (82 potential respondents) via the Enalyzer platform between February 24 and March 25, 2021.The data set came from a survey that consisted of ten questions with both dropdown and open-ended options for response. For this reason, the nature of the data and the type of research questions that the study addresses (Blaikie, 2003), the data has been analyzed using qualitative content analysis. The data analysis process consisted of coding and structuring codes into categories.  Finally, the data was collated into thematic clusters.

The survey was conducted (dissemination and data collection) The survey sample consisted of educators from VIA University College, Denmark, from the Design and Business educational program.

The primary objective of the survey was to contribute to the development of new knowledge on sustainable development educational practices within ESD at VIA Design. Therefore, questions addressed: educational area of the respondent, the level of relevance that respondents find in ESD, Circular Economy and Circular Design teaching and their motivation, which means of understanding the complexity of CE would they prioritize in adapting the principles to their curricula, and how important it is to develop sustainable or circular competences amongst educators.

Delimitation has been set for this research as the surveys and interviews are only made with both educators and students from VIA Design. This effects the results as the “composition” of students and educators is very different from other design-schools. At the speciality, Design, Innovation & Entrepreneurship, the students seek admittance to the study with very various

professional backgrounds. Students can have, like the educators a design-, a business-speciality, technical or arts-background. This makes the picture of "designers" blurry, but the definition of designers is here based on the notion that everybody who plans, performs, designs, and acts to change or make an impact on the world is a designer.

The research is also limited by the sample-size, as it is only based on 22 survey participants in the surveys to the students and only has 33 respondents from the educators, but it offers a brief glimpse on "how design educators can integrate transformative teaching strategies to encourage a shift in the way students view the sustainable future of their practice". Ideally, the research data would have benefitted in nuance and depth if it could have included more interviews - with educators as well. However, by combining interviews with students with survey analysis reflected on previous studies on the educators sustainable and Circular Economy competences this research gives a hint about the present potential of the role of the educators use of transformative learning methods in ESD.

## Empirical Setting: Design for Change at a Glance

The Design for Change course at VIA Design has a collaboration with the Center for Assisted Living Technology (CAT) under the City of Aarhus, Denmark. CAT hosts the CareWare, and Teknologi i Praksis, (TiP) a social-economic business. It consists of two teams of students from Via Design, Innovation & Entrepreneurship, who collaborates and works across faculties and campuses. The purpose of the collaboration with CAT is to develop new services, designs and solutions as part of the DFC course. Moreover, the collaboration aims to increase students' understanding of how to use their professional and academic skills, how knowledge production is on a societal level, in a novel and unknown context developing solutions with users of welfare innovation. The co-design-facility for the students has been Godsbanen, an entrepreneurial site for NGO's, designers, and start-ups in Aarhus. To the students the possibility to see welfare design and technology innovation at TiP's showroom and working with their partners and experts in transdisciplinary units, increases the understanding of the great potential of this area, providing students to understand how projects are designed, the technology used, and products applied.

The products exhibited include a wide variety of the latest products within high tech welfare innovations, including measuring devices, digital solutions, smart textiles, electrical fold-up scooters as well as more "traditional" geriatric aids in wood, furniture, and new wheelchair concepts. In additions the students were introduced to other start-ups, social entrepreneurs or NGO's working with Sustainable Development. The following two pictures are from the open exhibition at TiP, showing students from the 2020 course discovering themselves through trying new technologies and examples of the latest welfare innovation.

***Figure 5 Students exploring and learning from the curator in the exhibition, (Mie) about the exhibited examples of welfare design. Teknologi I Praksis is open for the public every day and visited by some 175.000 citizens and professionals per year.***

At the DFC course the key design approach has so far been the Design Thinking (DT) method – also known as the Stanford D-approach used in close connection with the principles of Transformative Learning. This DT approach is often described as one of two innovations as management concepts, but it differentiates from the Harvard Business School approach (HBS) as it focusses on creativity and designing a product or service. Critics of the DT correctly stresses how distant or "staged" Design Thinking away from the actual users – design-sprints or design-workshops, offer suffer from hollowness and becomes more form than content - an empty shell out of its context. In the DFC course the DT-tool is used as a steering and process tool, enabling the students to understand which phases, participants, users and needs are in use, but supplemented with real visiting authentic and volunteer people connected to the challenge; arthrosis, sclerosis, or other challenges related to the Sustainable Development Goals, which they may address during their work. By combining it with transformative Learning principles it gives the students' a wider and deeper understanding of the users.

The overall sustainable didactic framework for developing sustainable competences in the DFC is course is the Rounder Sense Project methodology, which will be used for interpreting the students' evaluations in a later part. But the DFC course tries to address three innovative elements in order to enhance their creativity and innovation competences. DFC tries to:

1. Make the students understand the role and levels of knowledge production. By interacting with real-time people, expert-users, in unorthodox and still novel contexts

for the student, they experience how knowledge (including their own) can be produced at several areas and levels of society, and how different actors from different fields of society produce knowledge: technologically, artistic, economic, cultural, public, private, NGO-based knowledge. This is supported using both the Decoding Creativity Tool and the use of transformative learning principles, in which the students reflect on own learning and re-visits their own practices, products or ideas meeting new audiences, which at first seems "foreign" or external to the students' own academic practice, but at the same time creates value for the idea. (Parodi, & Tamm, 2018)

2. Make the students foster realistic imagination by "visiting" real, authentic people, companies, NGO's public institutions and citizens, who can alter, disrupt and surprise the students' prejudices or self-perception. This has shown to be both "mind-blowing" and generates a high level of uncertainty amongst the students, but it often makes the results personal, authentic and in accordance with the people the collaborate with – apart from generate creativity and new networks. (Parodi, & Tamm, 2018)
3. Foster the students' and thereby VIA's engagement and action in the society and provide frameworks for generating solutions to uncertainty through entrepreneurial didactics, self-reflection, and emotional awareness. (Parodi, & Tamm, 2018)

The DFC course has been nominated VIA education of the year in 2018 and 2019 and has been nominated for the national Tietgen Award by the Danish Society for Education and Business in 2021.

## Pedagogic Principles of The Design for Change Course

The DFC course is generically developed over a period from 2014 – 2021 and in 2019-2021 consisted of "Transformative Learning Practice". Using the methodology of Mezirow (2009) and Illeris (2014a) in project-design and development. The basic ten pedagogic principles, as defined by Mezirow, (1997) could be described as the educator providing:

1. A disorienting dilemma which could be a setting in which the learner discovers own prejudices not to be applicable to a given new context or situation. This is often the case, when design students are expected to collaborate with the user-experts with psychical handicaps, sclerosis, or social issues. This dilemma is often challenging for some students, but also ignites the actual transformational learning.
2. Self-examination after a disorienting dilemma. On class the students will do a self-examination of beliefs and worldviews. Students reflect on their own background experiences and how this relates to the disorienting dilemma. This leads to the;
3. Critical assessment of own assumptions, taking a more critical and in depth look at their own past prejudices and practices. How does this impact our emotions and work? This hopefully creates a more unbiased worldview and opens the students towards new impressions. The next step is;
4. Planning a course of action, considering what learnings they now need and who they could collaborate with and how the;
5. Acquisition of new knowledge or skills to carry out the plan is needed. The students may have to re-think their own skills and competences and discover new perspectives from a design approach (Design Thinking) to enhance their learning and collaboration skills. After finding gaps or potentials in competences and learning the students' needs to

discover new functions, roles and learn about themselves and their competences by collaborating with other professions. By acting and interviewing other profession and reflecting on the DCT tool the students often experience new facets and capacities as well as new competencies they didn't know they had. Finally, the DFC encourages the students to believe in their newly discovered competences and;

6. self-efficacy and tries to support the construction of self-confidence and determination on working with sustainable changes.

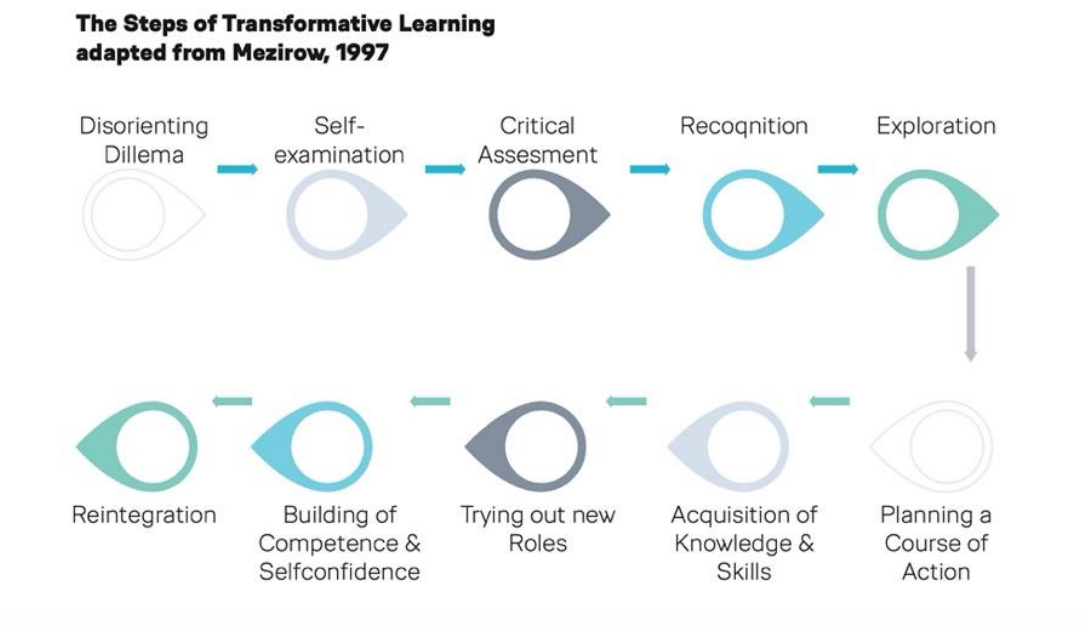


***Figure 6: The steps of Transformative Learning, adapted from Mezirow, 1997***

## Research phase one: Design of survey sample

A survey consisting of seven questions was conducted via the E-Analyzer platform to 37 students of whom 22 replied in October 2019 after the DFC Course and with both dropdown and open-ended options to further elaborate on their answer. The data was analyzed using mainly qualitative content analysis but also had a data-driven approach. The survey sample consisted of students from VIA University College, Design, Entrepreneurship & Innovation at the DFC Course, Denmark, coming from both the Design and Business educational program. The questions worked as the framework for the following semi-structured interviews, trying to make the students reflect on; how transformative learning through the DFC worked; was the course different from other ESD courses, - reflection on the students self-assessment of sustainable competencies before, during and after the DFC-course, how the student used the DC-tool, if self-assessment, reflection and dialogue enhance personal and sustainable competences, which competences could be important to use in complex / sustainable design challenges and finally how the DC-tool helped the student to understand her/his creative competences and their relation to sustainable competences.

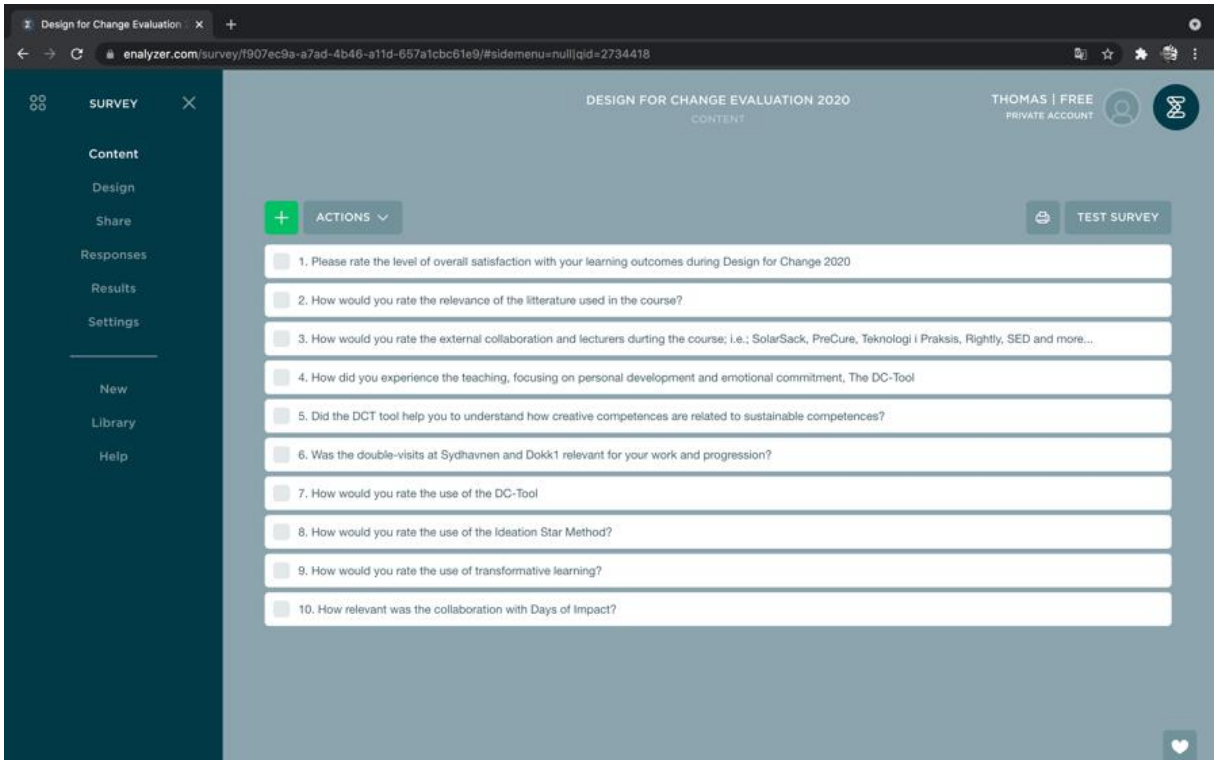


***Figure 7: The overall question frame – evaluating the DFC Course, 2020.***

Q4: How did you experience the teaching, focusing on personal development and emotional commitment, The DC-Tool

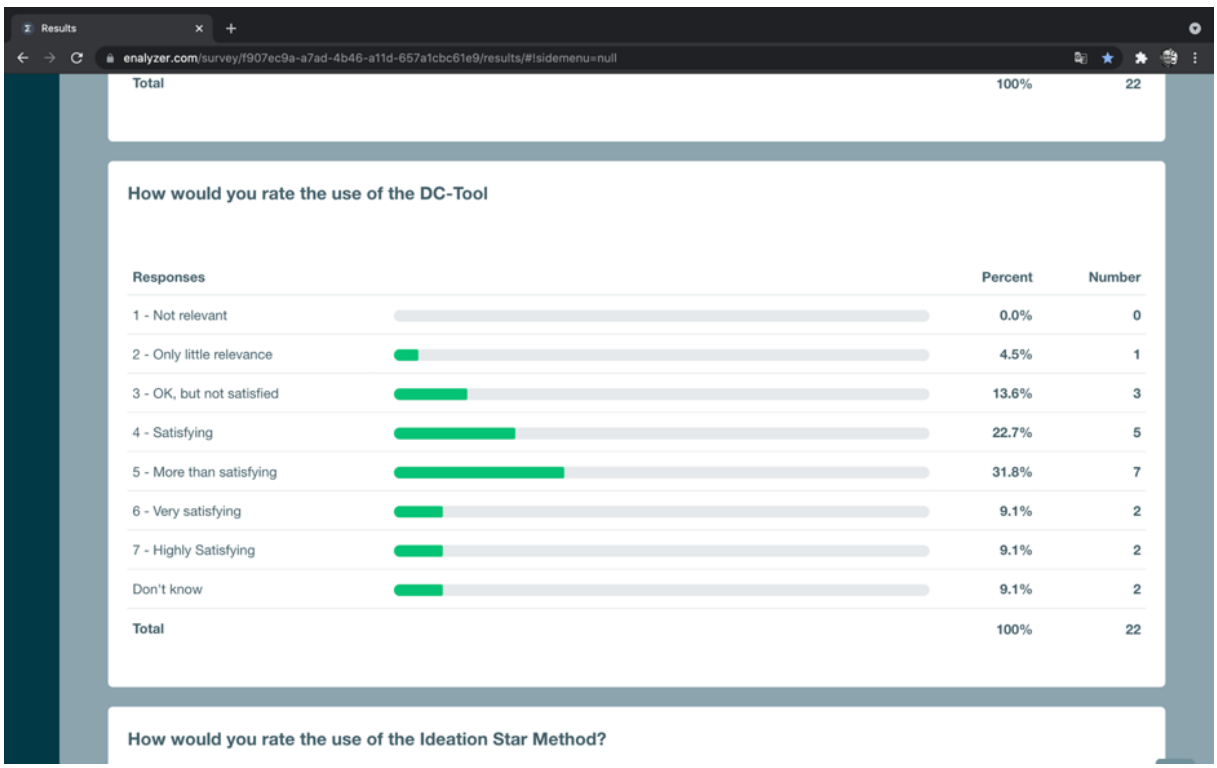


***Figure 8: The majority of students found the DC-tool relevant and useful during the course.***

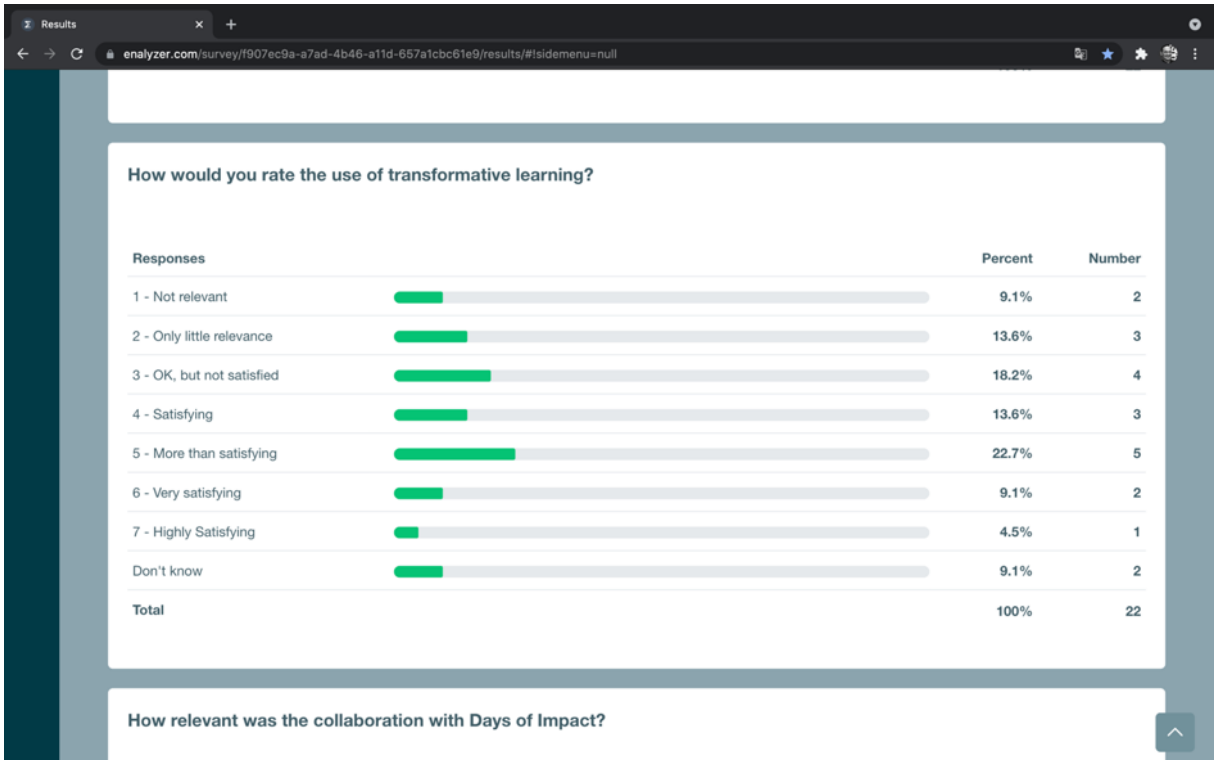


***Figure 9: Not all the students complied to the idea of transformative learning.***

## Research phase two: Interviews, design & analysis

The nine interviews were conducted (qualitative data collection) in October 2020 via Zoom. This phase aimed to bring greater depth to previous survey results but also to compare and place within personal reflections from the students on their personal development in accordance with developing sustainable competences. The semi-structured interviews (Lund, 2012) had a duration between 40–60 min. The semi-structured expert interviews (Silverman 2014) had a duration between 60–90 min. The themes addressed through the interviews are listed below:

- Educational background information of the participant
- Evaluation of transformative learning through the DFC; was the course different from other ESD courses? If yes how?
- Reflection on the student's self-assessment of sustainable competencies before, during and after the DFC-course
- How did the student use the DC-tool?
- Does self-assessment, reflection and dialogue enhance personal and sustainable competences? If yes – how?
- Which competences are the most important to use in complex / sustainable design challenges?
- How did the DC-tool help the student to understand her/his creative competences and their relation to sustainable competences?

The interviews were recorded and transcribed. Then they were analyzed through thematic analysis. Relevant sample texts were selected, and a coding frame was constructed following both theoretical considerations and the materials at hand (Lund, 2012).

## Results

The objective of the survey was to acquire new knowledge on how transformative learning methods using the DCT tool could enhance the student's reflection and self-awareness of sustainable competencies. The students were introduced to the DCT tool during the Design for Change course. It was used as a vocabulary and reflection-frame repeatedly for their performance and development as they were introduced to UNESCO's eight competences and the RSP model.

In the survey 89% of the students found the DCT-tool estimated they improved their understanding of the use of their own creative competencies in ESD / DFC. Before entering the course only 18% assessed they had the competencies to handle complex, sustainable, or social challenges. After having used the DCT tool and finished the course 68% of the students described themselves as more competent to work in ESD's.

**Q 3: Do you feel more or less competent to work with sustainable challenges in the future after using the DC-Tool?**

R4: "The Decoding Creativity Tool is for me is strong and nice tool to get a clearer perception of who I am, what is important to me and help to remind me later when I feel lost."

**Q4: Does self-assessment, reflection and dialogue enhance personal and sustainable competences? If yes – how?**

R1: "To me it was something new and scary. I was afraid I couldn't keep up with my own or the educators' expectations. I was a little anxious when I did the first try out – and when I saw the result, I was amazed that I have so many competences. I honestly didn't know my educational background, or my personality could contribute – but I think I have learned to believe in my potentials."

R6: "We had so much quarrel in the group regrading using the DC-Tool. Self-assessment was really not nice, I think. It became something un-cool in our group, as I think there was a competition going on about who was the best and most sustainable creative of us. That was not nice. But I think we could have gained more from it, if we had learned how to interpret it better on the class – but time was an issue. We didn't have the time with the educator to understand the full picture, unfortunately."

**Q5: Which competences do you think have been the most useful / are the most important to use in complex / sustainable design challenges?**

R6: I discovered that understanding how things are connected (systems thinking) is important. Before the course I didn't know if and how municipalities and NGOs could collaborate and what roles I could have in this. I also discovered that acting and getting involved in the challenges is cool and giving.

I also didn't know my creativity could do a difference. But it can! I think the use of many of my competences are important. But communication and critical thinking is very important.

**Q6: Did the DCT tool help you to understand how creative competences are related to sustainable competences?**

R1: "It makes me feel better- I can do something good to the world – I found out I have so many nice skills!"

R2: "It guided me toward creating Something with bigger impact over just thinking basic on performance and doing "the right stuff."

R3: "It has created a deeper meaning and understanding of my way of working. I think I now have a different understanding of who I am and what I can do in a fucked-up world. It has helped to make me actually feel I can make a real difference with an important meaning for others as well. I had not at all guessed that my creativity had such a big impact on how I work and see my fellow students. It's been exciting."

**Q7: How does working with the Sustainable Development Agenda in the DFC course make you feel?**

R1: It "makes me feel like we are making an impact within the world. Like we are creating something with meaning."

R3: "At first very overwhelming to see the world has so many problems and so many people are suffering and lots of people don't care... then a feeling of empowerment and determination to help make a positive impact."

R2: "It is great motivation to create ideas that could change things ! Yet I feel demotivated by the feedbacks most of the time and settle down for more little projects..."

R4: "just fine to focus on the Sustainable Goals in an innovative process -, it puts a little perspective on how to develop an idea or product with a greater purpose. It was actually also a tough emotional process, I think."

But when making a survey amongst 33 fellow educators at VIA Design, only 32% of the educators found they had sufficient competencies to teach Educations for Sustainable Development. And this could also be one of the reasons why the students felt insecure to work in ESD's.

## Research phase Three: educators survey results

The survey reveals that educator's competencies are not as developed but there is willingness to further develop/learn; there is a lack of confidence of the educators' own competences; presence of hesitancy towards adapting ESD, CE and CD into the curriculum as the educators experience a reluctant, slow and non-innovative industry. This portrays more of an attitudinal barrier were cultivating a sustainable mindset while enhancing CE and CD competencies might prove effective on a long-term.

Some of the practical challenges connected to teaching Sustainable Development or CE in Design Educations is of a generational origin. As some of the educators may have been educated in the 1980's, 90's or 2000's they are work within a linear production system and with a linear mindset and, as this research also shows, un-aware of new circular design-methods or principles. This makes it impossible to generate a systemic circular approach towards the fashion system. Alongside engagement in practice-based and action research, lifelong-learning for the educators is necessary to be able to understand the complexity, barriers, and opportunities that a circular fashion system. Furthermore, a transition for educators from an expert role to a facilitator can better manage exchange on circular information, enable a systemic approach and thus allow space for students to innovate. It is difficult to make the change happen as many of the present educators do not themselves have any experience or education with CE or CD in practice.

## Discussion: Alone in the Wilderness, - The Educator and the Sustainable Competencies

When UNESCO puts education as the most regenerative potential of sustainable change, the potential is still restrained by the present practices of both management, educators and students when performing ESD. The "mirroring" of the present value-chains, linear extract driven exploitation of the Worlds resources and "growth" based business models brings us closer to the end of education as we know it today. UNESCO (2021) expresses great concern if we have reached the end of an educational practice and therefore need radical revisions of the practices.

In other words, there is a self-destructive culture immanent in the structures of academia and educational professions slowing the transition to the necessary ESD-status. As research on ESD stresses, the HE's need to initiate the changes rapidly and in holistic and systemic ways (Ives, Freeth & Fischer, 2019, Mulà et al. 2017). UNESCO defined a "whole-institution approach" which requires; (UNESCO, 2014)

1. An institution-wide process… that enables all stakeholders – leadership, teachers, learners, administration – to jointly develop a vision and plan to implement ESD in the whole institution.
2. Technical and, where possible and appropriate, financial support…to the institution to support its reorientation. This can include the provision of relevant good practice examples, training for leadership and administration, the development of guidelines, as well as associated research.
3. Existing relevant inter-institutional networks are mobilized and enhanced in order to facilitate mutual support such as peer-to-peer learning on a whole-institution approach, and to increase the visibility of the approach to promote it as a model for adaptation. (UNESCO, 2014)

But, as the need for a whole-institution approach is well documented, UNESCO has so far not yet expressed how it should be done in practice or implemented. In this regard the educator is still "alone in the Wilderness" – just like this study shows, applying and testing personal ideas, political beliefs, methods and transformative didactics. One of the major challenges is, that HE are sub-divided into faculties, institutes, disciplines of specialization. But – what if the HE's were divided into themes instead? This approach could include transdisciplinary project-based

collaboration on issues like, inequality, welfare and health, water or new materials and thereby make research, epistemologies and practices dissolve into common exchanges of knowledge. Some HE's doing this in Denmark, i.e.; Roskilde University and Aalborg University, and the origins of the transdisciplinary, transformative ways of collaborating in Denmark often has an origin in the ideas and research made by Illeris, who has been an influential force in developing transformative learning theories. (Illeris, 2015 & 2014c).

In 2021 VIA University College, became a member of the UNESCO Associated Schools Program committing itself to a continuous development and support of working with the Sustainable Development Goals in a "whole-institution" approach. In this way the new importance of the educations, research, and activities of VIA points at the future of the students, projects, values, ethos, practices and beliefs of the future workforce, researchers, and educators – but the path is still practiced by repeating the present silos of research, education and value-chains in R&D and educational construction. The imperative to act differently has so far not emerged and reached the educators. We still practice what we did before. And the surrounding industries – as some of the input from the survey shows are reluctant if not hesitant to implement the needed changes and thereby the sustainable competences of the designers into their practice, which again makes the educators hesitant towards making radical alterations. Illeris (2014a) advocates for the implementation of transformative learning and project based (thematic) learning and demonstrates through his research how project studies differs from the tendencies towards competitive New Public Management based efficacy orientation on the educational institutional and political level. In many countries the efficiency of education is measured by and boosted through establishment of large institutions, exact learning objectives, testing and constant assessment of the objectives for students, staff and employees. Illeris points at the risk of developing "superficial" learning environments based on merely professional or academic syllabus rather than focusing on the students and educators transformative learning; personal development, tolerance, interaction with the surrounding world, deep understanding through action and flexibility. (Illeris, 2014a, p. 575)

At the Centre for Sustainable Fashion, at London College of Fashion, (LCF) UAL (Interim report 2016-19) Professor Dilys Williams, and Education for Sustainability Leader Nina Stevenson, have developed a "…framework and set of pedagogic principles have been developed to support evolutionary and transformatory approaches to fashion education, communicated through its research, teaching and learning and knowledge exchange projects. This includes the development of a framing of fashion education as a system, which has been applied to this plan". (Williams & Stevenson, 2018, p. 8)

The LCF approach is interesting in this connection as it is a full-scale attempt to implement both values, didactic and pedagogical principles, collaborations with the surrounding communities and forms the Education for Sustainability Transformation (EST) in Fashion strategy. It involves "long-term commitment to a transformational and evolutionary process of change that can take place inside and outside of formal teaching and learning, the university buildings, and disciplinary borders." (Ibid p. 8)

By setting a framework for EST The LCF sets new standards for both students and educators, collaborating companies and the surrounding society the understand the interconnectedness of personal beliefs, educational and research practices and their relevance to the connected

industrial sector and society. (Rauch & Steiner, 2013) This could help the educators to feel together with someone in the Wilderness – and enable them to navigate through it together. (Wamsler, 2019)

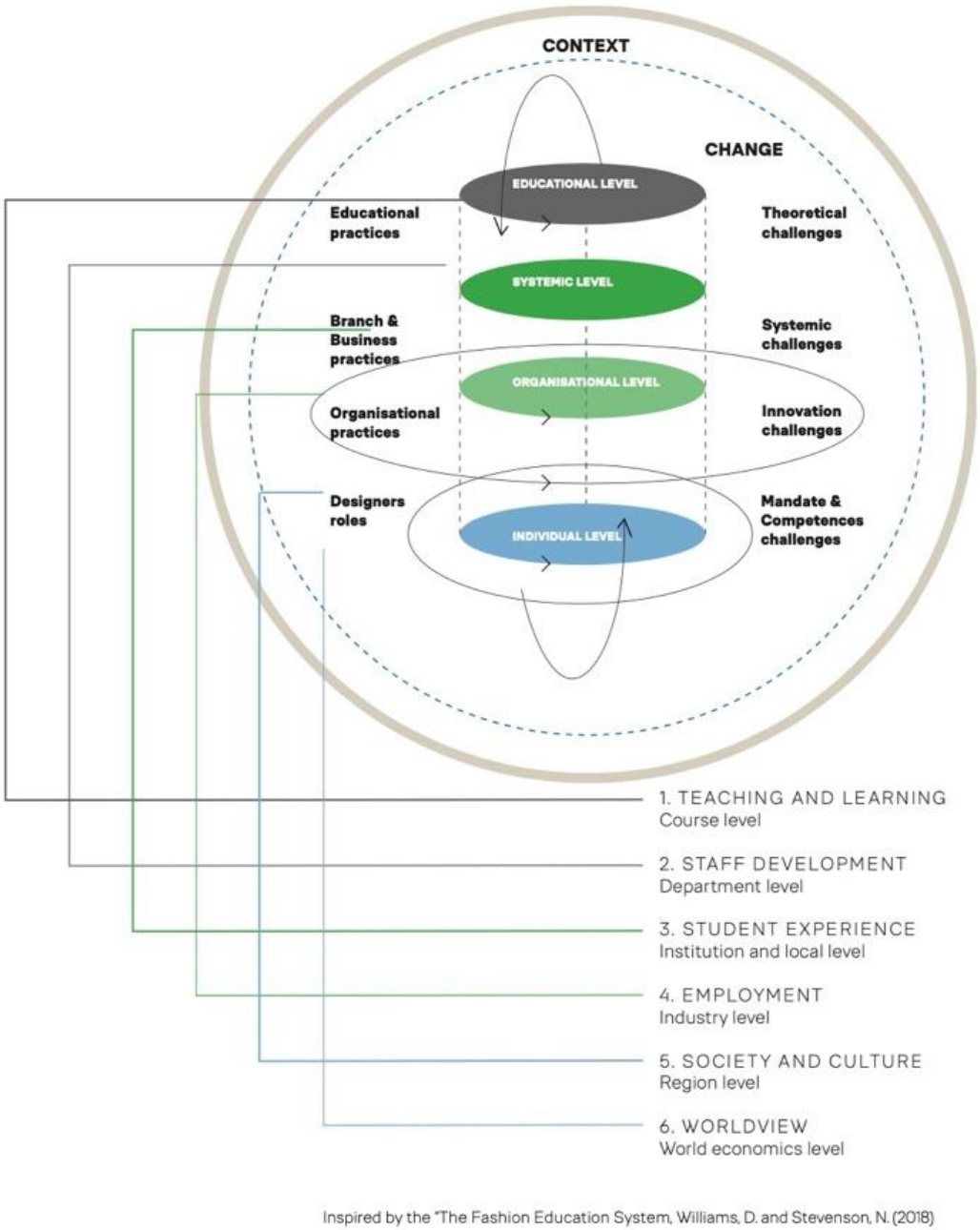


***Figure 10: Illustration of the corelations between practice, roles and education adapted from Williams and Stevenson (2016).***

The illustration is inspired from Williams and Stevenson, 2016, visualising how teaching and learning is highly connected to society and culture, staff development, industrial challenges,

practices, organisational challenges and the expected and present roles of the designers in both education and employment. Education for Sustainability Transformation calls for a wider transdisciplinary approach which can help the educators to see inter-relations and common interests in developing new curricula. This could be done through themes – projects across silos. (Illeris, 2014c).

So, when two ESD researchers; Vare & Scott (2007) proposed using transformative learning didactics, based on dialogue to engage learners, they also demonstrated how this in turn can lead to sustainable change. But building the educators key competences necessary for sustainable development also requires the application of a transdisciplinary didactic approach. And as Kövesi et al., (2019) explains - adding new didactics to sustainable or CE-educations will challenge the educator even more. It requires a didactic framework in which all the implemented voices and views on the sustainable challenge can be heard, to avoid reluctance or hesitance towards integrating ESD principles to the education. Kövesi et al., 2019 stresses that educators are unlikely to feel "at ease" with teaching sustainable development issues if they are incapable of applying a didactic frame or understands the full picture themselves. Applying a transdisciplinary approach when developing pedagogical or didactic dispositions of ESD's can help enhancing the holistic professional understanding of sustainable complex challenges, but as Kövesi et al. experienced, the development of transdisciplinary teaching materials can be difficult and requires both time and a completely new way of working together across silos. And, as the survey shows, the educators are willing to make a change, but they are confused to what level they should start developing the alterations themselves or whether the management will help them. The change will also require a managerial mandate; time, economy and transdisciplinary courage when developing teaching materials, themes or didactic approaches together.

## Perspectives:

This study has shown how the use of transformative learning methods; the DC-tool and Mezirows principles in the DFC course to a very large extent is in accordance with the latest recommendations of developing Educations for Sustainable Transformation. And by now, a huge variety of HE's have been working on and documented the implementation of ESD's. ESD - research shows many case studies of faculty or university specific transformation processes in changing curriculums and the efforts being made to enhance the student's competencies for Sustainable Development. But lately, research indicates promising opportunities when building and focusing on developing transdisciplinary ESD competencies among academic staff in HE's to provide change in curricula (Vare, 2018). In this way, facilitating "lifelong learning processes" amongst the academic staff can improve the overall ESD learning, interacting with the surroundings and teaching competencies, as well as this could even provide a new power of "meaningful reason" for management, educators, collaborating companies and in the end, the students. (Vare, 2018).

The educators somehow still feel they are "working alone in the wilderness", but the example from LCF with a clear vision, methodology and use of pedagogical transformative tools could enhance an Education for Sustainability Transformation. The LCF example is – in accordance with the principles of transformative learning and maybe we should elaborate on these ideas and apply project-oriented thematic ways of organizing the future design-educations. Also,

more research on the field of Education for Sustainability Transformation Practices is needed as only little exists.

There is an anomaly between the wishes for the future of education from UNESCO and the real educational world which we need to address in research, practice, and learning. Educators are very often “alone” and needs research-based support to develop ESD’s. The DECS project has provided insight in how educators can establish a new processual dialogue and transformative vocabulary between the students and the educator when working in ESD’s and some improvements of the behavior and competence-development could be read from the first research made, using the DC-tool.

The real-life transformative learning setting of the DFC Course was determining the outcomes as the interaction with real people and companies was stressed again and again as important for understanding sustainable challenges as well as development in the student’s reflections. The DECS project is a new useful reflection framework, for a progressive dialogue and informally extra-curricular based experiential learning. On the same level, the Rounder Sense Purpose Framework for evaluating the development of sustainable competences has been a very useful tool and has provided new insight. But both the Decoding Creativity Reflection Tool and the RSP tool are “extras” to the present curricula, and some students moaned about being forced to spend precious time on reflection-tools rather than working on their projects. And this calls for reflection from the educators.

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