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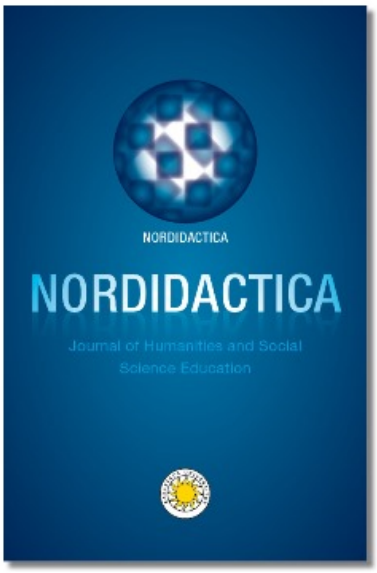

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Contingency and transformation. Teachers' and students' experiences of a Climate Council School Project

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Abstract: This paper presents a case study of a Climate Council School project within education for sustainable development (ESD). Students and their teachers from grade 9 and upper secondary school took part in this project when working on finding sustainable visions and solutions for their city in 2030. The project involved the local government as well as businesspeople, since they all met and shared sustainable visions at the climate council conference. Drawing on transformative learning theories, the case is studied and analysed from both teacher and student perspectives. Educational challenges as well as new possibilities are documented outcomes through the participants' experiences in this school project aiming for sustainability. Initial contingency, in relation to the complex content and new ways of teaching, is found to be a presumption for learning as creative work, transformation, and new ideas contributing to a more sustainable society.

KEYWORDS: EDUCATION FOR SUSTAINABLE DEVELOPMENT, TRANSFORMATIVE EDUCATION, CASE STUDY

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Her research interest is mainly within environmental and sustainability education and especially aspects of learning from a child- and student perspective. Besides research, she works as a teacher at the teacher education programs in Umeå, and further collaborates with the local community in issues related to ESD.

Introduction

Living in the era of Anthropocene environmental crises as well as societal (and unsustainable) changes requires new thinking, valuing and actions. This need for sustainable transformation and change is not only clearly heard in society in general but in schools in particular. Mutual involvement of schools and society is, however, not always the case, even though they strive for similar goals. On the contrary, the current educational situation is roughly described as being at the centre of different demands and expectations regarding what to do and teach. First, as an overarching but not always specified goal, Education for sustainable development (ESD) strives to promote young people's opportunities to think "outside the box", act in common, and engage in societal and environmental issues (UNESCO, 2014). Secondly and quite the opposite, the mainstream educational curricula are striving in the other direction; towards more control and assessment of individual pre-determined knowledge, including fewer options of innovative and critical thinking as well as a knowledge in-use (cf. Au, 2011).

Standing in the crossfire of different educational policies and perspectives, teaching for sustainability could be a delicate issue to handle in practice as well as a complex and controversial matter for students. Based on a case study of a "Climate Council School Project" (WWF, 2017) on which secondary school students, teachers, and members of the local government met, worked and discussed sustainability issues, a focus was set on teachers' and students' opportunities and dilemmas when taking on new educational challenges, such as transdisciplinary questions, and transformative learning related to sustainable development.

Aim and research questions

The aim of this study was to explore and describe educational aspects in a transdisciplinary and socially integrated school project focusing on sustainability issues. The aim was further to gain knowledge about whether, and how such work could contribute to transformation and change when educating for a more sustainable society.

- How do teachers and students experience a transdisciplinary, and socially integrated project in sustainability education?
- What educational challenges and possibilities does this kind of project work include?
- How can a socially integrated school project contribute to transformative education related to sustainability?

Background

In this section the concept of Climate Council School Project is presented together with previous research related to transformative education and social learning as vital aspects of ESD.

What is a Climate Council School Project?

In order to implement school activities for sustainable development, different organizations launch their ideas globally. WWF is such an organization, which for many years now has worked to support educational activities in practice, for example *Earth Hour City Challenge* (now called *One Planet City Challenge*), and *Our City 2030* (WWF, 2017a). The main idea behind these activities is to create possibilities for students and schools to engage in society through providing forum for co-operation with local government and entrepreneurs. According to new demands in GAP, the global action programme on sustainable development (UNESCO, 2014), we ought now to scale up and start acting for sustainability and not just learn about it. One part of the WWF school project "*Our City 2030*" is to arrange a Climate Council, where all parties meet and discuss in a democratic forum, i.e. the students and politicians meet in real life with aims of generating new and sustainable innovations for their city. In practice, the students work with a school project that includes empirical fieldwork such as sampling data from local citizens (interviews or questionnaires), and visiting the city hall or other central institutions. From the data gathered, the students are then supposed to analyse and present new creative (and more sustainable) ideas for their city at the final Council. The Council is democratic in the sense that the participating students are given equal amount of space to present their ideas in relation to the adults. Furthermore, in the round table sessions all participants have one vote each in discussing and prioritizing between different ideas. In the guidelines for Climate Council school projects (WWF, 2017b) there is a list of what can be achieved through this kind of school project: Increased participation in local climate action initiatives, experience through action, motivation and challenge, allows the teacher to act as mentor (WWF, 2017b, p. 4).

In relation to WWF's ideas for educational activities, an external assessment and was carried out in 2016 and a report written with participants from Swedish schools. In this report, based on qualitative interviews, a focus was set on the outcomes in terms of students' increased knowledge and skills in relation to the pre-set goals. The results of the evaluation reveal that student engagement and motivation increased compared to ordinary teaching, especially due to the social relevance of the issues, allowing space for creativity, and "real life connection". Difficulties were found in relation to traditional school structures, different time-scales, and establishing communication with new partners. One of the analytical aspects pinpoints that knowledge is here experienced through action and participation in societal issues, as promised in the guidelines. The report ends by discussing and problematizing the function of education in a changing society and exemplifies how even the buildings preserve old traditions. In summing up, the authors of the report find that the WWF initiative "Our City 2030" contributes to reaching the global goals for sustainability through its transdisciplinary and societal character (WWF, 2016).

Education for sustainability transformation and change: previous research.

Current literature and curricula within the field of ESD propose that changes are necessary if one is to turn unsustainable ways of living and knowing into more sustainable ones. Previous studies have shown that it is not enough just to increase the base of knowledge if a change in behaviour is needed (Kollmuss & Agyeman, 2002). Instead, we need to transform our ways of *knowing*, *acting*, and *valuing* as a more holistic approach to teaching and learning through, for example, critical reflection. What, then, are the demands for achieving sustainable transformation through education?

Knowledge and understanding about sustainability issues are experienced and defined as being complex and interdisciplinary (cf. Walshe, 2013). Sandri (2013) suggests that systems thinking is a threshold concept in education for sustainability. She argues that understanding the content of sustainability as a complex system is a key to deeper learning. According to the definition of threshold concepts, when understanding such a key concept, a transformation of thought is possible, in other words real learning could occur (Meyer & Land, 2006). Issues of sustainability are even described 'as being "wicked" and interrelated like spiders' webs of complex systems (Seager, Selinger, & Wiek, 2012). Rittel and Webber wrote already in 1973 that, within general theories of planning, the questions dealt with were best described as wicked. This meant that there was no fixed solution to the problem since a complex and intertwined number of aspects are involved, and solutions were rather to be seen as resolutions in relation to the best choice of outcome (Rittel & Webber, 1973). Those questions are, therefore, often controversial, involving conflicts of interest among the people involved, and could be delicate to handle in the classroom (Lundegard & Wickman, 2007).

Action and behaviour as part of transformation is the other aspect when teaching and learning for sustainability in a holistic way. In the new demands and perspectives on what education for sustainable development should lead to there is a general opinion promoting knowledge-in-action instead of just knowledge. This re-definition of knowledge, and the purpose of education is seen in the title of the current educational document, GAP, Global Action Program (UNESCO, 2014). Older theories on learning like KAB (knowledge- attitude- behaviour) suggested that, if there were enough knowledge, a change in values and action would follow automatically. Nowadays we know that it is not as simple as that (Kollmuss & Agyeman, 2002); action for sustainability demands more than factual knowledge; it is rather seen a matter of action competence (Jensen & Schnack, 2006). When dealing with complex environmental and sustainable issues, a holistic view, critical reflection and emotional engagement is needed when moving from knowing to acting (Almers, 2013).

Emotions and values is the third educational area of attention in a holistic and transformative approach when learning for sustainability. There is a vast amount of literature today pointing to the emotional and value-laden aspect of environmental and sustainable issues. One part regards the individual and emotional responses students show when learning about these issues (Manni, Sporre, & Ottander, 2017; Ojala, 2005;

Rickinson & Lundholm, 2008); these can be both challenging and beneficial for students learning processes. Other parts are on a more general and political level, where environmental values compete with economic ones on a global arena also shown in the classroom (Gough & Scott, 2006; Sund & Öhman, 2014).

Teaching in, for, and about sustainability could involve challenges for the teachers. It is known to be an area of integrated and changing knowledge, which could be demanding for teachers (Axelsson, 1997; Bursjöö, 2014). One aspect of this challenge is that the role of the teacher changes from that of the expert to the guide or co-researcher. The complex and changing context of sustainability could take the teacher out of their ordinary comfort zone compared to teaching in the traditional school subjects (Borg, Gericke, Hoglund, & Bergman, 2012). Many schools nowadays pay attention to the global curricula for sustainable development as a transdisciplinary issue, but there are, however, competing tasks found in traditional structures in schools, such as subject specific goals and grading (Johnston, 2009).

Besides the dilemmas described above, the moral and political perspectives of sustainability education have also been raised in previous research. Bob Jickling wrote many years ago the contentious article "Why I don't want my children to be educated for sustainable development" (Jickling, 1994). There he argues that the inner spirit of education is to be critical reflective, and by that the word "*for*" is problematic and stands for a normative and contradictory view of democratic education. The political, and ethical aspects of teaching on sustainable issues have gained further attention and consensus in more recent research after Jickling's article (cf. Hopkins, Jickling, & Wals, 2012; Håkansson, Östman, & Van Poeck, 2018; Sund & Öhman, 2014). Furthermore, when problematizing the normative aspects on sustainability, and instead emphazising critical thinking as well as action competence, the concept of "*transgressive learning*" has emerged as a way of challenging the status quo and crossing traditional borders (Lotz-Sisitka, Wals, Kronlid,& McGarry, 2015).

Finally, and of relevance to this article, is the previous research and perspectives regarding social learning for sustainability. This perspective argues firstly that learning is constructed in a socially situated context, and secondly that education and learning has aims beyond just schooling the individual. It rather purposes that learning must be seen as a way to socially transform both individuals and the society they are participating in (Dewey, 1916; Laessoe, 2010; Wals, 2009). There is a vast number of previous studies where children and youth have engaged with and participated in environmental projects outside schools and in their communities with results such as increased meaning-making, sense of agency and citizenship (cf. Brody, 2005; Caiman & Lundegård, 2014; Hägglund & Samuelsson, 2009; Roth, 2009). On the other hand, there are also studies showing that schoolchildren feel that what is taught is not relevant to them, now or in the future (cf. Hartman & Torstensson-Ed, 2007). Furthermore, insecurity regarding whether possibilities of taking action and making a difference in society has also been exhibited among younger students (Manni, 2018), something worth considering in relation to the field of ESD and its aims.

Summing up, when it comes to sustainability education, we notice from research that this is not an area of traditional schooling. It is rather citizen education in a broader

sense, including democracy, action competence and ethics; things that require a transformation and change in how we perceive and apply knowledge, action, values, and agency.

Theoretical perspectives

Some central theoretical aspects discussed in relation to transformative teaching and learning are *contingency and unexpected outcomes.* Transformation means to change from one way of understanding, acting, and valuing to another, new one. Or, as Cranton (2006) puts it: "*When people critically examine their habitual expectations, revise them, and act on the revised point of view, transformative learning occurs*". Leaving the known and established behind for the unknown includes taking a risk. Biesta (2013) further claims that this is the true and beautiful nature of education; contingency and unexpected outcomes. True teaching and learning, he argues, should not be mistaken or compared with a factory where the process of schooling results in the same type of products, i.e. learning is not stereotypical but individual, contextual and unpredictable. Biesta as well as Cranton relate their writings to some extent to John Dewey's theories on experiential learning (Dewey, 1916, 1933, 1934). In Dewey's theories, learning is an active and ongoing process between experience, reflection and action. These processes are seen as both continuous and contingent: contingent because every experience is specific and situated, which is why you cannot for certain predict the outcome in advance, continuous because these processes are ongoing in our daily lives of meaning-making. Like Dewey, Mezirow (1978) describes 10 different steps of experience, reflection and action within the theory of transformative learning, Mezirow (1997) further argues that transformative learning is crucial, especially for adults, since it develops autonomous thinking.

In a recent article, the authors draw on the Dewian theory of learning processes and argue that the rather new ESD concept of "scaling up" could be understood as a learning process with an emphasis on considering the unexpected, i.e. the contingent (Mickelsson, Kronlid, & Lotz-Sisitka, 2018). In their article, they include not only the cognitive aspects when learning, but also the ethical in the spatial and transactional encounters between the learners, the learning artefacts and environments. In conclusion, they argue:

> *By having the ESD-activity becoming part of and transforming ongoing practices, lasting changes could be achieved in and through scaling-as learning. (p.3)*

Another related theoretical perspective put forward in this matter is the concept of *sustainable literacy.* In an anthology, researchers develop ideas about what skills humans might need in a changing world, and how educational transformation can support the development of sustainability literacy (Stibbe, 2009). Alternative ways of knowing and being in the world are presented alongside central issues of sustainability, for example, social and intergenerational justice; mental and physical well-being; and cultural diversity. Regarding education, emphasis is put on informal learning, Citizen

Education, and the learning society as a whole. The ideas are not new, Lugg (2007) in her study described how outdoor experiences provide possibilities for developing sustainable, literate citizens. That study showed how the holistic experience of the outdoors provided a vital ingredient in meaning-making and interrelated understandings in sustainability issues.

A developed branch of the concept of sustainable literacy is found in the SULI-test (https://www.sulitest.org/en/vision-mission.html), a webpage that offers testing of the individual knowledge, skills and mindsets that are supposed to promote sustainability. In relation to the perspectives put forward in this article, problematizing the normative and political aspects of ESD, some caution is expressed regarding this organization even though it is an appealing definition:

> *"Sustainability Literacy" is the knowledge, skills and mindsets that allow individuals to become deeply committed to building a sustainable future and help them to make informed and effective decisions to this end.*

The fact that sustainability education has there gone into a matter of business, and an individual measurable skill is found to contradict the other theories presented here. As a matter of clarification for this article, the perspectives, and practice of sustainability literacy put forward by Stibbe and colleagues resonate with the theoretical standpoints here taken, while those in the SULI- test do not.

Methods

A case study method to gather data in various and complementary ways was chosen for this study. The choice considered that deeper understanding of a specific case through thick descriptions of the situated context, and participants' stories contributes to valuable and relevant knowledge (Flyvbjerg, 2011; Yin, 1994). The school project was studied, and comprehensive and varied data were gathered through observations and field notes from meetings and school visits. Formal and informal interviews with teachers, students and project organizers as well as documentation, evaluations, and samples of students' work were also part of the data material gathered. More than a hundred students and their teachers took part in this annual project; see Table A for a presentation of the participants.

TABLE A

Participants in the study

Participants	Notes	N
Grade 9 students	2 classes	40
Secondary school students	3 classes	90
Teachers in grade 9	Natural science, Social science and language teachers	4
Teachers in upper secondary school	Natural and Social science teachers	6
Project leaders	Non- teachers	2

As a matter of ethical consideration, all participants were informed about the study in written and oral form before the study started. All teachers took part in the project voluntarily, but it was mandatory for the students, as it was part of their ordinary school work. Interviews and sharing samples of their work were, however, undertaken on a voluntary basis. Since the students were in the age range 15 –17, no permission was asked from the parents: instead, they could decide by themselves whether to take part in interviews or share their school work. No questions were of a private nature, and they only referred to their educational experiences. All participants were anonymous, and pictures are presented with permission

As described, this case study focused on teaching and learning in sustainability issues, which was theoretically defined and understood as integrated, situated and continuous processes. Since the school project was studied over time, and meaning-making processes were assumed to develop continuously, the analyses and structure of presentation were informed by narrative methodology (cf. Connelly & Clandinin, 1990):

1. *Setting the scene* – in the first step empirical data regarding the specific context of this case and its participants was gathered and analyzed in order to present a rich contextual description.
2. *Telling the story* – in the second step, the story of the project "Our City 2030 – Climate Council" was analysed in chronological order through the dated observations, field notes, and interviews. There was a focus on both teachers' and students' experiences, and meaning-making processes as participants in the project. Critical events/ aspects in the story were also identified and are presented in this step.
3. *Analysing the plot* – finally, the story of this case, and its critical aspects, are analysed and interpreted in relation to the research questions of this study, previous research and theories regarding social and transformative education for sustainability.

The contextual description of the case, and results of interviews and evaluations were presented by the researcher and verified by the participating teachers in order to gain validity. The final analyses of the plot, in relation to previous research and theories, was carried out by the researcher and author of this article.

Results

Setting the scene – the Climate Council School Project

The community where this project took place have been working with education for sustainable development for many years. In the yearly plan for activities related to ESD, the climate council school project is one of the prioritized activities. The experts responsible for the ESD implementation, who then invite teachers and their students to participate in the arrangement, lead the project. Participation is voluntarily for the teachers, but the framing of the project is to some extent set through the predetermined

structure. Participating in the project is then mandatory for the students, but with some freedom of choice within the thematic work. The teachers participating had varied experiences of working with ESD, from almost none to many years of experience. The students who took part this year were in grade 9 and in the first year of upper secondary school. The project took place in the first semester of the school year, from August to October. For this year's local arrangement, the theme *Our City 2030*, *Visions of a Sustainable City* was inspired by the WWF concept (2017b). The explicit aim of the project was to let the students take part in how the community is organized and works, furthermore, to let them be part of a democratic and visionary process and share their sustainable visions about the future with adults.

The school project was structured and implemented in five steps or phases, as described in the schematic overview here below:

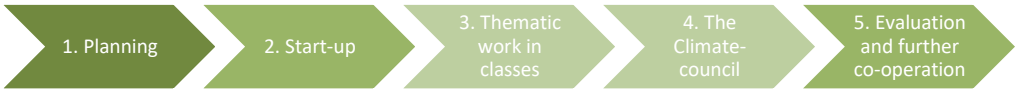

FIGURE 1

Phases of the school project

The students did not take part in the first phase of planning; only the teachers met and discussed mainly practical matters of the project before the Start-up that the organizers provided in phase 2. In phase 3, the teachers and students together decided how and what to do within this project, while, in phase 4, everyone gathered for the council and finally, in phase 5, reflections and evaluations were made with all participants.

The story of the school project aiming for sustainable development

In this section, the story of this case is told in chronological order. The focus is on the experiences of the participating teachers and students.

1. Planning

The project started with an initial meeting with the teachers and project leaders where practical information as well as expectations and previous experiences of the teachers were discussed. The teachers were both enthusiastic and somewhat cautious. One of the teachers who had participated in the project several times before showed great confidence in the task, and had been engaged in sustainability issues at her school for many years. The other teachers had no experience of this project but were experienced teachers in their respective subjects. Those latter teachers showed some concern and worries about how much time this project would demand from their ordinary teaching, and how the practical arrangements were made. After the meeting, the teachers then decided to collaborate in teams and decided that their students could

use the lessons in both biology and social sciences for working with the project over 6 weeks.

2. Start-up

The school project started with a one-day Start-up for all students and teachers that participated. Besides presentations by keynote speakers from the local government, lectures and talks related to sustainability in their community, the students and their teachers were given a guided bus tour visiting a local eco-garden, a house building site, and the institute of design focusing on eco-innovation. The aim of this day was to give the students some inspiration and input on the innovative ideas needed to reach a sustainable city in 2030. The students appreciated this day, since they thought it was interesting to see new things in their own city, but also because it was of an informal kind, and there were opportunities to talk to friends as well. In the evaluation afterwards, some students pointed out that there should have been a more explicit information about the aims of this start-up; some of them did not really understand this at that time

3. Thematic work in classes

After the start-up, the work in the participating classes started. The teachers used a pedagogic structure of thematic work in groups, where the students chose their own topic in relation to the project theme. The students then had to make a project plan and carry out both background research and discover some new inventions/ solutions to the topic or problem they had chosen. During this period, the researchers visited each school twice to observe, and to talk to students and teachers about their ongoing work.

3a. At the start of the thematic group work, the teaching and learning processes were vivid and unpredictable regarding the topics to be chosen and final outcomes; you could actually describe the start as somewhat chaotic and confused. This made some of the teachers stressed, since they could not make detailed plans in advance regarding subject-specific content, and they felt as if they had lost control. One teacher blamed herself in this matter, saying that she had limited knowledge of sustainability issues, did not really have the time to do her own research into it, and realized this caused what she said was a "*slow and tentative*" start. They also said that valuable time was lost on students just thinking about what to do and "*not really working*". Other teachers, on the other hand, structured and carried out this phase as a common mind-mapping in class, where all kinds of ideas were discussed and aspects of them were written on the whiteboard. Those teachers did not express stress about lost time to the same extent as the others. In the evaluation, many teachers wrote that next time they would minimize the time spent on choosing the subject in the initial phase in favour of more time for the students to do in-depth background research in the second phase.

3b. The first observation visit was just after the start described above. After choosing topics, the students had started to do background research in different areas related to their topic, many of them used the internet to find the information needed. Now the

teachers acted like mentors and discussed with their students where to find information and how they could advance with their work. The task included not only defining and describing an area of concern in their view of their city in 2030, but most of all coming up with sustainable solutions for their area/topic. It was those solutions that were to be presented at the end of the project, at the Climate- Council, where the students would meet representatives from local government, trade and industry. In the conversations when visiting this phase of the project, some teachers expressed worries about the students not having enough knowledge in all specific subject areas needed for their transdisciplinary work on sustainability. In the evaluation, this was also mentioned again:

> *.. well, for example, in Social Sciences, some parts are quite simple, but it was difficult to reach a deeper understanding in the complex topics they chose, since their knowledge of economics is limited and has the effect of them suggesting unrealistic solutions.*

Another teacher then replied on this problematic aspect and suggested:

> *Maybe the project should involve the students in year 2 instead of year 1 since they then would have more basic knowledge…*

In total, at this stage of the project, a variation of independent work by the students was observed, and the teachers expressed some worries about the process of the project.

3c. At the second observation visit, the work in class was mid-way. Now, the picture was quite changed, all students worked independently on focusing their topics. Some groups were out in the city centre interviewing citizens on their consumption habits; others were making a short movie about air-pollution, and some were building models of safe and eco-friendly local transport (buses). When talking to the students asking them to describe what they were working with, they all gave engaged and detailed descriptions of their topics. At this time, the teachers discussed how their students should present their work and encouraged them to hold a short keynote in the opening ceremony. This time, none of the teachers mentioned any stress, but instead showed me how they also used schemes to check what areas of the ordinary subjects the project included. The teachers had, furthermore, decided that, besides the presentation of the project in groups, all students were to hand in a report to be individually marked. One biology teacher told me that, by using these schemes, she could justify the time spent on the project in relation to the subject-specific demands in the curriculum, and in this way felt more in control of the project.

4. The Climate Council

The Climate Council day was finally reached and was carried out as a one-day conference with invited guests, equal in numbers between students and adults, at a big conference centre in the city. The day started with an opening ceremony with keynote speeches and short presentations from some of the students before the exhibition opened. All groups of students displayed their work through poster presentations, small-

scale- models, videos on screens, etc. The invited visitors could mingle and visit all the counters and talk to the students. After lunch, there was a round-table session, where students and adults discussed sustainable topics in mixed groups. The conference closed with another key-note speech. Observations from the Council showed active students proudly presenting their work, but also engaged and honest interest from the invited guests. Local media also reported the Climate Council and the students' work. (see pictures from the Council below)

FIGURE 2

Students presenting at the Climate Council

5. Evaluation and further co-operation

After the project ended, oral reflections as well as written evaluations were made in the participating classes. The teachers also met with the project leaders for a common evaluation and summing up. At the meeting, practical issues regarding needs for improvement were brought up by the teachers initially, but aspects of teaching and learning were also discussed. The worries about their responsibilities for students gaining subject-specific knowledge and the grading of this in relation to the transdisciplinary project were discussed again. The teachers found that the aims of the project had been fulfilled, and also that the project met the content in the subjects of social sciences, natural sciences and geography, but also that the students only reached the level of medium grades. In comparison to this discussion at the beginning of the project, they now in addition recognized other skills and knowledge that the students had achieved in this project. They mentioned skills such as communication, doing research, problem-solving, solution focus, but also knowledge about how local government works, societal structures, and democracy. They thought it was a good idea for the students to "get out of school", but they wanted more feedback from the politicians regarding how their students' ideas were regarded or whether they had any real impact. One of the teachers summarized her reflections like this:

> *This is a different way of working with our traditional school subject;, it is demanding but it also gives a lot of energy back!*

In the evaluations, students described that they had experienced the project positively and they felt that this schoolwork was "*for real*". A majority of the students wrote that the best thing about the project was that they got to meet the politicians:

> *You got to help'. I mean, you were listened to, and it felt as if you might have helped a bit by sharing ideas and visions of a more sustainable city.*
>
> *The Climate Council was really fun! We would love to do it again next year if we got the chance. It was a good opportunity to practice for future events. To present and discuss our project with the politicians was great, I would easily say this was the best project in grade 9 ever.*

Regarding what new knowledge they had gained through the project, a majority of the students said that they had learnt new things, but most of all they had started to think about what they knew before in a new way, and the had acquired valuable knowledge and experiences for the future. The Climate Council school project also resulted in some unexpected outcomes and further co-operation; one group of students that presented new and innovative solutions for buildings was invited to meet the city architect and present their ideas in greater detail. They had caught her interest at the exhibition with their models made in the data programme *Mine-craft,* and were now invited together with her to meet the construction company to come up with a sustainable solution for a real-life project.

Analysing the plot – Contingency, transformation and new possibilities

The structure of this analysis follows the three research questions posed for this study, discussed one by one, followed by a final concluding discussion.

- **How do teachers and students experience a transdisciplinary, and socially integrated project in sustainability education?**

In this particular case, the experiences of teachers and students were in total mainly positive. The project has given an example of how education for sustainable development can be carried out, but also what challenges and new possibilities this might bring. From a teachers' perspective, the role is changed from control to guidance, due to both the complex content but also the structure of the work; this was similar findings as from the WWF (2016) report. The transdisciplinary project also revealed a teachers' dilemma between achievement of subject-specific curriculum goals and their assessment, and broader educational goals related to sustainability similar to Johnston's (2009) statement almost 10 years ago. The experiences (of both teachers and students) related to the character of the teaching and learning processes were of a changing character during the project, shifting from insecurity, almost fumbling, to intense work, engagement and confidence. In other words; it was neither a linear nor an exponential process of teaching and learning; the visual picture of the processes is instead rather described as adventurous walks in the compound landscape. The analytical reflection of these experiences refers to the complex content of the project that is similar to the concept of "wicked problems" (cf. Rittel & Webber, 1973), where the question is not to reveal the true fact but to reason about what solution might be the best (sustainable) choice in the specific situation. The way of working and thinking then differs from more

traditional ways, which could explain the initial confusion, but also the engagement in the end at the Climate Council. Through the theoretical lens of transformative learning, these processes align with (and in practice describe) the phases described by Mezirow (1978): when you first experience a disorienting dilemma, you must undergo phases of self-examination, alienation and insecurity before you start to relate to previous experiences, explore options for new possibilities and ways of acting. After that, courses of action can be taken, new self- confidence is gained, and finally you can reintegrate into society with your new perspectives. The students' task to critical examine the traditional structures in society, and create new sustainable solutions through co-operative work with peers and politicians is here to be seen as one example of transgressive learning in practice (cf. Lotz-Sisitka, Wals, Kronlid,& McGarry, 2015).

Besides the experiences described above, another aspect of this project being led by "experts" was that some teachers experienced it as a top-down project. They felt that they were not in charge as usual, and wanted more time than that given to discuss with colleagues. Being a project, this was in some sense not an example of ordinary and traditional teaching, but still confirmed previous studies such as Bursjöö (2014), where challenges like this were also seen. The most evident experience expressed by the students was that this was "for real"; their school work was for once for real. This result is highly relevant and somewhat alarming, and we might ask ourselves why ordinary and traditional schoolwork does not succeed in that to a greater extent.

- **What educational challenges and possibilities do this kind of project work include?**

The study displays the struggles, and solutions, teachers have in order to meet both the curriculum demands and scaling up ESD to action and agency (UNESCO, 2014). It also shows how they balance old and new ways of viewing knowledge and learning processes in their teaching practice. The strategy of visualizing and organizing what and how subject-specific content was accomplished in the thematic work through the schemes is one example. From a critical point of view, this displays the fear of not doing the "right" thing according to the curricula, and how those who participated left their comfort zones and control to engage in teaching involving social learning more than merely their own subject.

Outlining the challenges and possibilities more explicitly but also theoretically, I here turn to Biesta (2013). The examples of the initial contingency are here understood as a pre-condition for transformation, change and meaning-making. When you dare to take the step into the unknown , then creativity, critical thinking and new possibilities emerge if you let it happen. Biesta did not write his philosophical text especially with ESD in mind, but it is interesting and relevant in analytical comparison to this empirical study. Following similar argumentation already twenty years ago, Axelsson (1997) presented the aspect of the unknown as an important ingredient for environmental learning and teaching, where it is argued that teacher themselves also learn when teaching in this open-minded way. The results of this case study show that some of the challenges were also the pre-conditions for the possibilities in terms of transformation and new solutions. Another way to put it is that the *teaching challenge* is the pre-condition for the *learning possibility*, according to the theory of transformative learning

(cf. Cranton, 2006). If there had not been any risk-taking from the teachers at the start of the project, there might not have been the good outcomes seen in the students' work presented at the Climate Council at the end.

From a practical point of view, the teachers struggled to balance the demands of the formal curricula with how to be able to fit the project into their tight schedule with subject-specific grading. This aspect is not to be underestimated; it is a real issue in terms of how schools are organized and are politically dependent, as earlier showed by Johnston (2009) and Au (2011), and in that way provide (or do not provide) opportunities to work in a transdisciplinary and thematic way. In other words, if this is the case, there might be fewer possibilities for transformative and transgressive learning, and students gaining sustainability literacy.

One didactic concern remained and this returned in teachers' reflections on the project; How much traditional/ subject-specific knowledge is needed before students can think and act in a transdisciplinary way as in sustainability issues? To me, this is a question rooted in older epistemological traditions and in this case was not given enough time for deeper reflection. First, knowledge was expressed as deeper thinking, not acting or valuing as in a holistic epistemological view. Second, it reveals a view that understanding parts is vital before understanding the whole. This again does not resonate with ideas within systems thinking (cf. Seager et al., 2012), which instead suggest that a transdisciplinary project such as this could open up to both deepen and broaden understanding also in traditional areas and contents. This study did not measure student understanding in depth, but recognizes the question as a didactic dilemma for teachers in practice with theoretical underpinnings.

- **How can a socially integrated school project contribute to sustainable transformation in society?**

This last question is ambiguous in relation to this small-scale case study. The analytical answer is, therefore, to be seen as tentative, and perhaps a longitudinal study could answer that, still relevant, question better. Some things could, however, be stated as outcomes of this study. The first is that the Climate Council project provided opportunities for young people and adults to meet and share their visions of a common future. Due to the limited time of this school work (as projects in general are constructed) the awareness of deeper layers of political structures and dilemmas, even though democratic, might not have been reached by all students in this single project. Although, engaging with the society outside school was appreciated by the majority. This was maybe the most evident reflection from the students; that this project was "for real". In terms of motivation, agency and preparing future citizens for participation in society (cf. Biesta, 2006; Dewey, 1916), this must be seen as an important outcome also in relation to previous studies where young students did not feel as empowered as those in this case (Manni, 2018). Transdisciplinary, or wicked, problems are the real-life issues. This project was not just a game of pretence, but the work and the solutions were for real, and in this case some of the students' visions were realized in their society by a local construction company. These examples align with the social learning theories (Laessoe & Ohman, 2010; Wals, 2009) that education should be a democratic and

participatory act in society. The results also show that a school project like this can be a good starting point for a sustainable transformation in the local society.

Conclusions and implications

Returning to the initial statement in this article: new thinking, valuing and action is needed in our times of unsustainability, and schools play an important role in that. I find that a school project of the kind presented here has the potential to contribute to those goals and needs.

Working with transdisciplinary and sustainability projects in lower and higher secondary school involves challenges but at the same time unexpected possibilities. For teachers, one challenge can be to handle the balance between assessment criteria in the traditional school subjects in relation to the overarching educational goals connected to the project and sustainable development goals. Students seem to experience mainly possibilities and positive outcomes as meaningfulness, self-confidence and agency. Those are also the main benefits conveyed afterwards by the participating teachers, and the fact that their students through the project get to learn within the local community in an integrated way. Abstract concepts such as sustainability become more concrete and explicit through work on this kind of project. We have seen how in the project the way of thinking and knowing was challenged and transformed in different ways. We could also observe that the work in practice involved actions and required the students to discuss and evaluate the different solutions to their problems. Whether a more holistic transformation of actions and values took place through this school work could not be stated for sure, since we did not do a pre- and post-test, but that the work in itself engaged head, heart and hands in sustainability issues is unquestioned.

In this case a pre-set project inspired by WWF was chosen as the structure for integrated school work in sustainability issues. This must not be the case for others who want to work with ESD. Examples of transdisciplinary and more independent teacher- and student-driven work can also be seen in the Nordic context (cf. Scheie & Korsager, 2017) where integrative work with the local communities is a vital aspect.

The implications of this case study is that initial contingency is to be an expected part of a transformative work that educates students for finding sustainable solutions in their daily lives, as being part of society – for real.

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