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Supporting local school reform toward education for sustainable development: The need for creating and continuously negotiating a shared vision and building trust

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ABSTRACT
This article centers on a local school reform project aimed at implementing a transformative approach to Education for Sustainable Development (ESD). The study investigates the project in terms of how the design criteria of a continuous professional development program and critical factors of the implementation process influenced the actual teaching practices. Data were collected through interviews with 15 teachers from five schools, and a thematic analysis was conducted. The results showed that the local school reform had limited effect. Trust between school actors, strategic management, and reflexive collaboration appeared to be the most important enablers of transferring the reform agenda into teaching practice. Skepticism, ambiguous management, and local contexts were identified as obstacles, hampering the intended change. A concluding recommendation for implementing transformation oriented ESD through local school reforms and professional development is to add a novel and threefold design criterion to the existing criteria, namely that of creating and continuously negotiating a shared vision and building trust.

Introduction
There is a great need for solutions to the pressing environmental and social challenges in the contemporary world. Accordingly, Education for Sustainable Development (ESD) has, for almost five decades, been suggested as a pedagogical approach to address these sustainability challenges. ESD can be defined as a teaching approach that “facilitates choice between alternative futures which can be specified on the basis of what is known in the present” (Vare & Scott, 2007, p. 192). ESD can, according to Vare and Scott (2007), be understood in two main ways, denoted as ESD 1 and ESD 2. ESD 1 is about the promotion of informed, skilled behaviors and ways of thinking, while ESD 2 focuses on building capacity to think critically and to test ideas, exploring the dilemmas and contradictions inherent in sustainable living. In this study, we align with the latter more transformative understanding of the concept, although aspects of both are always present in ESD (Eilam & Trop, 2010).

The UN has published a series of policy documents with guidelines for national implementation of ESD (e.g. UNESCO, 2004, 2014, 2017). The ESD guidelines have made an impact on educational policies worldwide, including on Swedish national steering documents for education (Skolverket, 2011a, 2011b). Evaluations have nonetheless revealed not only that systematically implemented ESD is not common in Swedish compulsory schools, but also that which schools give strategic priority to ESD appears to be random (Gericke et al., 2020; SNF, 2018). Furthermore, Swedish students from certified EcoSchools (2021) or from Schools for Sustainable Development (Skolverket, 2020) do not discernably differ from students in uncertified schools in terms of their knowledge, attitudes, and actions toward sustainability (Berglund et al., 2014; Olsson et al., 2016). Similar results have been found in other countries, for instance

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Belgium (Boeve-de Pauw & Van Petegem, 2011) and Portugal (Spinola, 2015). However, a large Swedish study, including more than 2,400 students from grades 6 to 12, indicated that transformation oriented ESD based on a pluralistic teaching approach had a positive effect on students’ self-reported sustainability actions (Boeve-de Pauw et al., 2015). Also, in longitudinal studies ESD has been found to develop students action competence for sustainable development over time (Olsson et al., 2022), thus demonstrating the potential value of implementing ESD.

While more evidence is needed, ESD as a transformative teaching approach is a widely considered and promising approach to develop students’ action competence, and a significant challenge appears to be its establishment as a commonly used teaching approach (Gericke et al., 2020; Müller et al., 2021). Consequently, there is a need for educational reform and local professional development programs to enable the implementation of transformative ESD. The present study investigated the influence of such a program on teaching strategies, addressing how the program could be improved to change existing teaching practices.

Even though the ESD discourse is richly supplied with theoretical underpinning and hopeful rhetoric at the policy level, the convincing rhetoric often loses momentum when it encounters school organizations and classroom reality (Eilam & Trop, 2010). To bridge this policy–practice gap, local school reform projects, including continuous professional development programs aimed at improving ESD, have been launched in several Swedish municipalities. Given the resources invested and the degree of urgency to attain sustainable development, it is of great import to evaluate the outcome of these local school reforms (Desimone, 2009) and, based on the findings, improve the programs. It is thus imperative to identify the factors that enable or hinder realization of the transformative potential in local school reforms for ESD. The aim of the present study is to identify and discuss critical factors for implementing ESD in a transformative direction via a local school reform project.

Theory and background

In this section we elaborate on what constitutes a local school reform and what research says about how to design such projects. Then, we discuss what characterizes transformative education for ESD and present the theoretical model by Eilam and Trop (2010) used in the study.

Educational change in ESD

In this study we investigate the implementation of ESD from the perspective of educational change and school reform. According to Cohen and Mehta (2017), school reforms can be distinguished as either system-wide or niche reforms. System-wide reforms aim for broad adoption of the reform within schooling, while niche reforms only target a subset of the system, such as some group of schools or teachers working toward the aim of the reform. Cohen and Mehta (2017, p. 665) define niche reforms as “school systems that create a space in the education sector by defining a novel and specialized mission and mobilizing resources to support and sustain it.”

In Sweden, ESD as a teaching approach can be viewed as being implemented at the system level because the last revisions of the national curricula, applying to all schools, public and private, specify the implementation of ESD for compulsory schools (grades 1–9) as well as upper secondary school (grades 10–12) (Skolverket, 2011a, 2011b). Regarding the general curricula, the revisions prescribe that ESD is the responsibility of all teachers, which is also emphasized in many syllabi for specific school subjects, such as biology, geography, home economics, and civics. However, evaluations of practice (SNF, 2018) and research (Gericke et al., 2020) show only limited reform progress. Therefore, niche reforms in the form of local initiatives are important tools to achieve ESD advancement because these have better odds of succeeding compared with system-wide reforms, especially when the main goal is to change teaching approaches (Cohen & Mehta, 2017).

The local initiative in this study was based on the whole school approach in which teacher professional development (TPD) is deemed to be an important aspect of school reform (Mogren et al., 2019). The
characteristics of successful TPD for ESD are thus of particular interest, and a basic assumption is that TPD for ESD must include not only environmental and sustainability issues, but also needs to highlight the conditions affecting the outcome of the teaching and learning process, see Redman and colleagues (2018). The local school reform project of this study thus includes two components: a module for TPD and a module for local school improvement, which together support the school reform (see an elaborated description in the Methods section under the heading Context and the local school reform project).

In a whole school approach toward ESD, all stakeholders within a school should be engaged: students, parents, teachers, school leaders; and teaching should focus on authentic problems, thereby transforming the school itself into an agent of change in a sustainable direction (Henderson & Tilbury, 2004). Hence, the investigated local school reform shares some features with a research-practice partnership (RPP; Coburn & Penuel, 2016) as it engaged the schools in identifying the problems and built on long-term collaboration between researchers and stakeholders of the school. In RPPs, the emphasis is on the possibilities of implementing research findings in practice, as done here regarding ESD. However, this has proved to be more difficult to achieve when it comes to teaching practices in schools compared with other professional fields, which might be explained by the more open structure and weak control of schools compared with other professional organizations. Also, the profession of teachers is less regulated and lacks common professional standards (Cohen & Mehta, 2017).

In a previous study (Gericke & Torbjörnsson, 2022), we used a framework of capacity building (Shulman & Shulman, 2009) and analyzed how the teachers experienced the local school reform project. It was found that contextual factors outside the schools exerted very diverse kinds of external pressures, resulting in different outcomes of the project in the participating schools. In this study we deepen the analysis by investigating in what ways the design criteria of the TPD program and the implementation process at large influenced the teaching practices at the schools, i.e., how was the intended transformative ESD – the aim of the developmental educational reform – realized in practice and what influenced this arrangement? In the next section we outline the theory behind the design criteria of the local school reform project.

**Design Criteria for educational change in ESD**

As educational reforms always are difficult to implement, it is important to learn from the hallmarks of successfully implemented reforms and use them as design criteria in new projects. Kennedy (2016) argues that it is important to adapt local projects and professional development efforts to students’ and teachers’ needs and abilities. Cohen and Mehta (2017) identify five criteria of successful school reforms that underline this project. First, the reform should offer a solution to a problem teachers have and want to solve or, second, to a previously unidentified problem that the reform made them aware of and provided a solution to. Third, the reform should respond to a strong need from the political, economic, or social dimensions of education, satisfying a public opinion for change in the suggested direction. Fourth, the reform should include an infrastructure, that is, concrete practical guidance regarding how to use teaching tools and methods to achieve the intended change, and fifth, the reform should be reasonably consistent with the values of teachers, parents, and students. These general criteria for school reform have in a research review by Redman et al. (2018) in the field of ESD been translated into a set of design criteria to be addressed for continuous professional development of sustainability education. These design criteria were used to develop the local whole school project of this study and are outlined in the next paragraph.

A TPD program should target *key competencies in sustainability*, such as systems thinking, futures thinking, values thinking, strategic thinking, and interpersonal competence (Wiek & Kay, 2015). Furthermore, it should be *practice oriented*, linking theory of sustainability education with practice to develop an understanding deep enough to meet complex demands of teaching when practices based on former teaching traditions are being reconsidered (Timperley, 2010). TPD programs should also encourage teachers to become role models as *sustainability leaders* to avoid students experiencing inconsistency between the concepts taught and the teachers’ behavior (Lyons Higgs & McMillan, 2006). *Collaborative learning* may act as a trigger for changing teaching practices, thereby ameliorating student learning (Avalos, 2011; Mogren & Gericke, 2019). *Long-term duration and frequent contacts* (Darling-Hammond...
et al., 2009; Popova et al., 2016) are important to avoid TPD activities being rare exceptions to ordinary activities. It is vital that the TPD program is engaging and encourages a shift from problem-centered to solution-oriented in engaging learning, facilitating hope and agency for change among the students (Ojala, 2012). This means exchanging outdated instructor-centered programs for active-learning ones that combine real-world experiences and reflections (Freeman et al., 2014; Wiek & Brundiers, 2011). Further, the professional development actions should be evaluated (Popova et al., 2016). If these design criteria are used in the development of local school reform initiatives, it can be hypothesized that more transformation-oriented ESD practices could be developed by the teachers.

It has also been shown that these design criteria can have positive effects in professional development efforts. Murphy et al. (2020) found evidence that such TPD-programs influence teachers’ self-efficacy and thereby promote the development of transformative pedagogies for sustainability. In a review of research, Laurie et al. (2016) found that such programs also might have effects at the student level. However, few studies have investigated more specifically how these design criteria and other factors influence the outcomes of local school reforms. Some studies address the success more generally as indicated by organizational or cultural factors, but hardly any study could be found that related these results to the development of specific ESD teaching approaches, as is done in this study.

In a previous study (Gericke & Torbjörnsson, 2022), we found that the contexts of a school, such as migration and subsequent language problems among students, exerted external pressure impacting on the outcome of a local ESD reform project. Similarly, Sandholtz and Ringstaff (2016) found in a study of science education in elementary schools that the context is important for changes and their duration in teaching practices. Also, in general studies of professional development, support of the school leaders, collegial learning, resources, and teacher commitment are mentioned as important success factors (e.g., Kilbane, 2009; Sandholtz & Ringstaff, 2016). In ESD research, Andić (2020) found that effects of professional development on ESD in Croatia are limited, which might be due to the scarcity of such ESD development programs, and when existing, they tended to focus on individual learning rather than professional training. In a case study in Australia, Evans and colleagues (2012) found that implementing ESD demands discussion and negotiating among teachers to foster trust and enable school leader support for the reform. Generally, two reviews of the ESD literature point out that systematic and holistic approaches, including the whole school as in this whole school project, is an important strategy for mainstreaming ESD in professional development (Ferreira et al., 2007). In the next section, we discuss the aim of the local school reform, transformative education for ESD.

**Transformative education for ESD**

The need to transform society in a more sustainable direction is nowadays an ever-present theme in policy and in media reporting, and ESD aims to provide the knowledge, skills, attitudes, and values necessary to address sustainable development challenges (UNESCO, 2017). To identify the transformative components of ESD, we first need to define what constitutes transformative learning. According to Elias (1997), it takes place when the nature of consciousness changes and fosters a critique of the modern social world, or with the words of Mezirow (2000, p. 20), it involves becoming “critically reflective of those beliefs that become problematic.” Jickling and Wals (2008, p. 12) stress that transformative learning is more about “how to think, than what to think” and contrasts it to transmissive learning, which refers to the transmission of facts and skills to students. A contemporary definition, used by a journal specifically targeting studies in transformative education, is that transformative education “fosters deep engagement with and reflection on our taken-for-granted ways of viewing the world, resulting in fundamental shifts in how we see and understand ourselves and our relationship with the world” (Journal of Transformative Education, 2021).

In ESD research, Stevenson (2006) argues that transformative pedagogy should focus on teaching ecological limits without creating human suffering. Sterling (2004) points out that transformative ESD should address socio-ecological issues and facilitate critical thinking regarding conflicts of interest. The goals of transformative ESD are, according to Eilam and Trop (2010), to achieve responsible environmental behavior and active citizens’ participation. Hence, transformative ESD addresses open-ended
issues with no simple normative answers, but is rather a learning for an uncertain future where it is important to make decisions based on knowledge, values, and emotions. Vare and Scott (2007) argue that this understanding of ESD matches ESD 2, in comparison with ESD 1, which relates to more traditional cognitive learning of knowledge. Both these aspects of ESD are important, but since schools often are dominated by ESD 1 (Sterling, 2004), it is important to introduce also the more open-ended and pluralistic approaches of ESD 2 to teachers, as is the aim of this study.

**A framework investigating transformative ESD**

To analytically investigate the teaching practices in the participating schools, and how these practices reflect transformative ESD, we use a theoretical framework elaborated by Eilam and Trop (2010). Their model was developed based on a review of ESD research. We found this framework useful because of its broad scientific grounding in the ESD field as well as in practical teaching approaches. It defines four pedagogical components of ESD: *subject specific teaching and learning, multidisciplinary learning, multidimensional learning*, and *emotional learning*.

The first component corresponds mainly to ESD 1 and a transmissive approach to ESD, while the latter three components include the transformative aspects of ESD 2. We therefore concluded that it has great potential to be used as a tool to detect transformative elements in the teachers’ descriptions of their teaching. We recognize that other frameworks could have been used, but as Kennedy (2016) points out, there is no final model of successful teaching. In the next paragraphs we outline the framework in more detail in relation to the literature on ESD.

The first component of ESD learning is the traditional academic style of teaching and learning. According to the review by Eilam and Trop (2010), this is the most common teaching style. It is dominated by presenting subject-specific facts, describing different environmental problems, for example, acid rain and other forms of pollution. Increased factual knowledge is believed to be the primary solution to environmental problems (Sandell et al., 2005).

The second component, multidisciplinary learning, combines scientific facts in different fields – how it is – with considerations on what we should do. The distinction between is and should boosts rebounding between what we wish and what is desirable, activating the value dimension in teaching (Dewey, 1939/1988). The literature supports that multidisciplinary (including trans and interdisciplinary approaches) knowledge may facilitate acquisition of systems thinking and the formation of linkages between cause and effect within systems (Eilam & Trop, 2010). The importance of systems thinking in ESD is commonly emphasized in research (McKeown & Hopkins, 2007). Systemic study objects are complex issues that invite inquiry-based pedagogy and are thus by nature less predictable. It may concern “wicked problems” (Rittel & Webber, 1973), yielding answers characterized by better or worse rather than right or wrong. Hence, there are no normative answers to these complex issues.

The third component, multidimensional learning, incorporates spatial and temporal aspects, thereby further enriching the systems thinking. Discovering spatial differences between various locations, regionally and globally, raises an understanding of how a specific system interacts with other systems, for instance geophysical systems like climate, hydrology, and geology. It moreover involves how nature’s systems interact with societal systems, such as economy, production, trade, and technology, thus facilitating contextual ways of thinking. For example, climate change might be addressed differently in teaching if economic and consumption issues are in focus rather than hydrology.

The fourth component, emotional learning, enriches cognitive learning through emotional impressions and may activate individuals’ value preferences, which is a precondition for ethical considerations (De Sousa, 1987). Psychologists have found that emotional learning facilitates individuals’ ability to identify their own emotions and to build self-efficacy and self-confidence. It also enables them to take different perspectives, show respect and empathy for others, and consequently, cooperate and provide help when needed (CASEL, 2003). The importance of self-efficacy for constructive coping strategies during times of pressing environmental challenges is well documented (Boeve-de Pauw et al., 2022; Ojala, 2012), and perspective taking is a precondition for adopting a pluralistic approach (Berglund & Gericke, 2022; Rudsberg & Öhman, 2010). A recent meta-study supports that the most important effects of social...
and emotional learning are enhanced self-awareness and social awareness among students (van de Sande et al., 2019).

These four components of ESD served as analytical units of transformative ESD and correspond to the coding categories of ESD teaching in the Result section.

**Aim and research questions**

The aim of the present study is to identify and discuss critical factors and design criteria for implementing ESD in a transformative direction via a local school reform project. The research questions are:

RQ 1. How do the teachers describe their teaching in relation to Eilam and Trop’s four components of ESD?

RQ2. How do the teachers reflect on enablers and obstacles of the local school reform when developing ESD teaching in a transformative direction?

RQ3. In what ways have the enablers and obstacles influenced the ESD implementation in the participating schools?

**Method**

In this section we first outline the context of the local school reform project and thereafter describe data collection and analysis.

**Context and the local school reform project**

Grades 1–9 (ages 7–16) are compulsory in Swedish schools. They are regulated by a national curriculum, which applies to all schools. Grades 10–12 (ages 17–19), upper secondary education, are voluntary, but completed by nearly all pupils. Upper secondary schools are organized in nationally regulated academic or vocational programs, preparing students for tertiary education or an occupation.

The municipal school authorities in a midsized town in Sweden initiated the local school reform project in the form of a whole school project, which is explored in the present study. The project aimed at improving the transformative potential of ESD, with reference to the wording in the UNESCO (2014, p. 15) global action plan for ESD “to increase the capacities of educators and trainers to more effectively deliver ESD.” Five schools participated, engaging all teachers, school leaders, and other staff. Two school developers with more than 10 years of teaching experience and actively conducting ESD research (not authors of this article) served as the project management team, employed by the municipality to run the project. They were responsible for planning and implementing the professional development project (see module 1 below), and for supporting teachers, facilitators, and school leaders in the local school improvement project (see module 2 below). Their role was to help schools to identify problems and to build long-term relationships between stakeholders of the schools and researchers (themselves being both teachers and researchers) as suggested in RPPs (Coburn & Penuel, 2016). To identify possible needs for ESD, the two project managers initially carried out a pilot study involving school leaders and some teachers at the participating schools.

The project ran for slightly less than three years and included actions on multiple organizational levels, with two main modules: (1) a joint TPD program involving the five schools, and (2) a locally adapted implementation process at each school.

The first module (1) consisted of seminars for all staff members at the participating schools, providing basic knowledge and skills about ESD. A full day seminar was held each semester. In these TPD seminars, teachers and specialists from universities, school agencies, and NGOs presented scaffolding ESD learning experiences to the schoolteachers. The first seminar introduced the teachers to the concepts of sustainable development (SD) and ESD. SD was described using the three-pillar model including the dimensions of environment, economy, and society (Giddings et al., 2002) and the sustainable development goals
ESD was defined based on UNESCO (2014) and was related to transformative ESD as shown by the four components of ESD (Eilam & Trop, 2010). The second seminar added further to ESD theory, addressing why ESD is important, while the third seminar focused on interdisciplinary teaching and competencies required for conducting ESD. The fourth seminar offered varying examples of ESD initiatives and focused on cross-curricular collaborations as an implementation approach. All in all, the first module (1) targeted three design criteria of transformative TPDs according to Redman et al. (2018): key competences, engaging and solution-oriented learning, and linkage between theory and practice. After the present study, the teachers continued their work and the research team organized two more seminars.

The second module (2) transpired between the seminars, when the teachers integrated ESD into their regular teaching, aided by especially appointed facilitators—teachers with 20% of their working time allocated to facilitating ESD in their local school organization. On a monthly basis, each school organized local meetings led by the facilitators at the respective schools in which they discussed ESD and its local implementation with the teachers. The meetings were meant to be the incentives driving the ESD implementation from a bottom-up perspective, based on the local needs identified by the teachers themselves. In addition, regular meetings (three to four times each semester) between project management and school management, and between project management and school facilitators (from all five schools), were arranged. Also, the progress of the project was regularly evaluated in those meetings. Hence, the activities of the whole school project at the local level were designed to address the aspects of how to support co-learning, sustainability leaders, how to provide long-lasting and frequent contacts between participants, and evaluation, four additional design criteria to Redman and colleagues’ (2018) summation of characteristics of continuous professional development.

The five schools represented a great variety in terms of student population, teaching traditions, and local context. School # 1 may be denoted as a multicultural school and is a 4–9-year school with 350 students. This school is in a district with a high proportion of immigrants; approximately 80 percent of the students were first or second generation immigrants. School # 2 is a 4–9-year school with 450 students located in a well-off residential single-family housing district in the outskirts of the town. School # 3 is a primary school (K-3) situated in the same district as school # 1. School # 4 is a K–9 school with approximately 360 students and is situated in a small locality with rural surroundings. The classes comprised students from different parts of rural areas. School # 5 is an upper secondary school, grades 10–12, with students aged 16–19. It is the biggest school in town, with more than 1,500 students in academic and vocational education programs. The teachers from this school taught programs preparing students for a career in science or technology.

Data collection and analysis

Three teachers from each school were interviewed. One of the interviewed teachers from each school also held the role as facilitator, i.e., a link between the school and the researcher team, all facilitators sharing the responsibility to support the locally adapted implementation process. The other two teachers at each school were selected randomly based on availability. Eleven women and four men were interviewed, all but one woman with more than 10 years of teaching experience. The uneven distribution between male and female teachers reflects the uneven distribution of the sexes among teachers in the Swedish school system. Their median age was approximately 50 years.

The interviews were conducted a little more than half-way into the reform project, after about 1.5 years. The funding for this research did not last as long as the local school reform project and this evaluation study therefore took place with more than one year left of the project. The interviews followed a semi-structured guide (Kvale & Brinkman, 2009) with broad opening questions and follow-up questions divided into three main sections, see supplement S1 for the interview guide. The first section concerned the local school context, i.e., characteristics of the school culture, relationships among colleagues, with students, parents, and the surrounding neighborhood. The second section dealt with teachers’ experiences of and opinions about previously implemented local school reforms, while the third section investigated
teachers’ views on and experiences of the ongoing school reform including both the TPD (module 1) and the local school improvement process (module 2). The analysis encompassed all three sections, as teachers’ experiences from the past often affect how they relate to an ongoing project. Each interview lasted 35-50 minutes and was recorded with a voice recorder. The interviews were transcribed by a professional transcriber.

The teachers’ responses were analyzed regarding three aspects: a) indicators of successful ESD pedagogy, b) internal and external factors affecting the implementation of the ESD (enablers/obstacles), and c) how the sum of a and b relates to the local school reform project in each school.

Eilam and Trop’s (2010) four pedagogical components of transformative ESD, namely subject specific learning, multidisciplinary learning, multidimensional learning, and emotional learning were utilized as analytical tools for identifying ESD in the participating schools. The investigation included the teachers’ perspectives on the critical factors they deemed to have impacted the improvement of ESD teaching, and how the school reform project may have influenced their teaching.

A thematic analysis according to Braun and Clarke (2006) was conducted based on its ability to connect deductive analysis while identifying inductive themes within the deductive categories. The analysis followed these four stages:

(a) Reading the interview transcriptions and coding the four components of transformative learning (RQ1) and enablers/obstacles for implementing transformative ESD (RQ2).
(b) Reading the excerpts, validating their respective codes, identifying specific themes, and selecting excerpts illustrating each theme.
(c) Assessing the frequency of the themes relating to RQ1, using the following scale: dominating – nearly all excerpts, strong – more than half, intermediate – less than half, weak – sporadic examples.
(d) Interpretation of and reflection on how the findings in RQ1 and RQ2 may relate to the ongoing TPD program (RQ3). The analysis was thus a combination of a theory-driven, deductive approach (in a search for pre-defined categories) and a consecutive data-driven, inductive approach, extracting the themes from respective categories in RQ1 and RQ2.

In all stages of the analysis, NVivo 11 computer software was used.

Limitations and ethical considerations

As the analysis was founded on teachers’ statements and reflections on the local school reform project and their teaching, and not on direct observations, there is a built-in uncertainty whether what the teachers perceived actually took place. By interviewing three teachers from each school, including the facilitators that had the best overview of the processes at the schools, a plurality of opinions was secured. No major differences were discerned in the descriptions obtained from teachers at the same school, suggesting adequate validity of the results.

The study was conducted in accordance with the ethical guidelines for research (Swedish Research Council, 2017).

Results

In the Results section, we address each of the research questions consecutively. First, we outline the ESD approaches used in the schools and second, the enablers and obstacles for ESD. A summary of the results related to RQ 1 and RQ 2 is presented in Table 1. Third, in the last result section, we analyze how the local school reform project influenced the ESD practices in the schools. In the Results section, the themes are marked in bold, and excerpts with teachers’ statements in italics. A number and letter for identification follow the excerpts from the interviewed teachers. The numbers 1-5 after each excerpt refer to the school in question, and the letters a, b, and c refer to one of the three interviewees at each school.
Table 1. Summary of the results, including the themes and their prevalence.2

<table>
<thead>
<tr>
<th>ESD approach</th>
<th>School 1</th>
<th>School 2</th>
<th>School 3</th>
<th>School 4</th>
<th>School 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Single subject</td>
<td>Strong indications</td>
<td>Strong indications</td>
<td>Weak evidence</td>
<td>Strong indications</td>
<td>Dominating</td>
</tr>
<tr>
<td></td>
<td>– Science as the norm</td>
<td>– Teacher as subject individualists</td>
<td>– Teacher as subject individualists</td>
<td>– Subjects are isolated</td>
<td>– Science as the norm</td>
</tr>
<tr>
<td>3. Multidimensional in time and space</td>
<td>Weak indications</td>
<td>Weak indications</td>
<td>Intermediate indications</td>
<td>Intermediate indications</td>
<td>Weak indications</td>
</tr>
<tr>
<td></td>
<td>– Spatial dimension: Water use worldwide.</td>
<td>– Spatial dimension: Comparing food rules in different countries.</td>
<td>– Temporal dimension: Children through history.</td>
<td>– Spatial and temporal dimensions: Comparing conditions between places, Futures thinking.</td>
<td>– Spatial and temporal dimensions: Climate change education.</td>
</tr>
<tr>
<td>4. Emotional</td>
<td>No evidence</td>
<td>No evidence</td>
<td>No evidence</td>
<td>Weak indications</td>
<td>Intermediate indications</td>
</tr>
<tr>
<td></td>
<td>– To care:</td>
<td>– To dare:</td>
<td></td>
<td>– To care:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>– For humans and nature</td>
<td>– To defend human rights</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5. Enablers</td>
<td>No enablers mentioned</td>
<td>No enablers mentioned</td>
<td>No enablers mentioned</td>
<td>Reflexive collaboration: Visiting classrooms.</td>
<td>Reflexive collaboration: Visiting classrooms.</td>
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<tr>
<td>– Trust:</td>
<td></td>
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<tr>
<td>– Internal and external</td>
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<tr>
<td>– Reflexive collaboration</td>
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<tr>
<td>Exchanging teaching ideas.</td>
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<tr>
<td>– Strategic leadership</td>
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<tr>
<td>Long-term continuity.</td>
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<td>The students’ weak language skills.</td>
<td>– Local context: Tradition of individuality.</td>
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<td>Troublesome traditions.</td>
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**ESD teaching in the schools**

In this section we present the analysis of the ESD practices occurring at the schools according to Eilam and Trop’s (2010) four pedagogical components of transformative ESD. Within each category we also identify commonly occurring themes (marked in bold). See also Table 1 for a summary of the results.

**Subject-specific teaching and learning**

Teachers from four of the five schools referred to subject specific ESD teaching. Three themes were discerned in relation to this pedagogical component: **Science as the norm, Subjects are discrete, and Teachers as subject individualists.**
Science as the norm for sustainability was the most prominent theme in schools 1 and 5, signaling that natural science subjects are considered as default for sustainability issues. “… as I have taught science for many years, I have worked with this (sustainable development) all the time – there is a lot about it in my subjects: physics, chemistry, and biology” (1a). Teachers in subjects other than science, and from schools 2 and 4, also linked SD to environmental issues and science, while no teacher from school 3, the primary school, made this link.

Subjects are discrete was most clearly articulated in school 5. “We have kept to our subjects so much” (5a) and “we sit with fellow subject mates so it is clear that it also confirms this view [of discrete subjects]” (5c). In the secondary schools, isolation between subjects was expressed in terms of uncertainty of how other teachers teach, or how SD is operationalized in other subjects. “… but really how each teacher presents it [SD] in concrete terms in their teaching, was hard to see” (1c).

Teachers as subject individualists. “There is a risk in this that everybody enter their classroom and do their race” (4a). A question whether they had ever seen a colleague teach, was in school 2 answered with “No, have never done that” (2c). This individualistic theme was however not expressed in schools 1 and 3. These two schools were distinguished by a higher degree of collegial cooperation, reflected also in the next coding category.

Multidisciplinary learning
Teachers from all schools referred to experiences of multidisciplinary ESD projects, and more often as a temporary thematic add-on content, like food or health, than as an underlying perspective. Sustainability development goals (SDG) as thematic projects constituted a multidisciplinary umbrella in all the schools. It was most clearly expressed by teachers in school 5: “Every classroom is wall papered with the global goals” (5b). In this school, the range of multidisciplinarity was limited to a few subjects. “In mother tongue and physics on climate change, we use the global goals for essay writing” (5c). Projects in secondary (K7–9) and primary schools, however, commonly included many subjects. “On global goals we worked with food as a theme in each subject, and also transdisciplinary” (2a). School 1 focused pedagogical energy on language development in all subjects. Language development as the multidisciplinary tool became a theme. One teacher coordinated language teaching in different subjects, adding support proffered by local specialists at the municipality. The argument was that “language is a big part of that [sustainable development]” (1b), and without proper language skills among the students (who mainly consisted of immigrant students), the ambitions of ESD could not be fulfilled. The focus on language skills involved all subjects and was not restricted in time.

Multidimensional learning
Multidimensionality in space and time was rarely expressed by the interviewees at any of the schools, with the exception of school 4, where spatial dimension became a theme with regard to forestry in different countries, or to children’s living conditions. “What does it look like in other countries? – How do children live there?” (4a). Temporal dimension was yet another theme, both historically “What was it like to be a child in Sweden hundred years ago?” (4a), and with a futures perspective: “You can think ahead. Make a plan. Is it sustainable to continue as I do, or should I do something else?” (4c). One of few examples from the other schools concerned “rules for food and eating within different religions” (2c).

Emotional learning
Emotional learning appeared as a rare exception in the everyday school activities in two of the schools (schools 4 and 5). Very few interview excerpts disclosed how students’ senses and emotions were engaged to enrich an experience or functioned as motivators for addressing a controversial or ethically challenging issue. The theme to care was illustrated by children’s efforts in school 4 to create a safer route to the school. It was suggested that several trees should be cut down to make room for a pedestrian and bicycle path. When staff from the municipality informed that the trees were protected, the children were upset that trees were more important than children: “But why do we have to protect trees? We have to protect children.” (4b). This issue aroused a genuine interest among the students in how motives to protect both
nature and mankind are interconnected. To dare was the theme when two classes in school 5 visited a photo exhibition about people who, at risk themselves, made efforts to save and protect others. The two groups reacted very differently, showing that emotional learning can take on different expressions, depending on individual differences in past experiences. Thus, the visit provided substantial inspiration for a discussion on the importance of whistleblowers, the matter of “civil courage … and dare to stand up for human rights” (5c).

**The enablers and obstacles affecting implementation of ESD**

In this section we present the analysis of the enablers and obstacles that the teachers perceived to have influenced the ESD implementation during the school reform project. Within each category we identify commonly occurring themes (marked in bold). See also Table 1 for a summary of the results.

**Enablers for ESD**

Three themes appeared particularly important to unleashing the transformative potential in the TPD: trust, reflexive collaboration, and strategic management.

Trust as a relational phenomenon that facilitates collaboration surfaced most clearly in the two schools with a large share of immigrant students (schools 1 and 3). “… we have had to support each other very much over the years because it has been difficult, sometimes a small staff and difficult conditions so I would say that this willingness to collaborate is part of the walls” (1c). The trust between colleagues was nurtured by trust from the parents, “This is the kind of neighborhood where trust from the parents is greatest, I would say” (3a), and by two teachers being present during the lessons at school 3. The importance of this double trust, among the staff and from the parents, stood out as a compensation for a perceived distrust from the media, “There are lists sometimes in the newspaper, and our school stands last, worst” (3c), and a sense of unfair judgment in comparison to other schools in the municipality.

Trust seemed to be a key factor in the open-minded atmosphere that is required for reflexive collaboration, where both hardships and blessings of the work were spontaneously discussed. “… you can come to your colleagues and say HELP! What a hard lesson it was, … how they behaved, and exclaim your frustration, and it’s okay to do it and to ease the pressure” (3c). In the two schools with high proportion of immigrant students (1 and 3), the collegial reflection seemed not to be reserved for urgent occasions, but was a recurring element in the daily work. “… to spontaneously reflect on your teaching and so, we do a lot during coffee breaks here, not organized at meetings” (3a). “We chat every afternoon on how it worked, what we shall do and what we could have done” (3c). These continuous and regular reflections provided teachers with knowledge about the work of their colleagues, making imprints on their own teaching.

“Accordingly, I get a lot of ideas from what others are doing that I get to know, yes … but I can do that, … she thought so” (1a). In effect, this manner of reflexive collaboration was a way of generating informal TPD. In school 5, the need to form a common ground for pedagogical reflections had initiated “lesson exchanges, visiting other teachers’ lessons, so learning from each other in teaching” (5a), while no such undertakings were noted in schools 2 and 4.

Interviewees from all five schools emphasized the importance of strategic leadership for developing transformative education. When teachers looked back on what they perceived as successful development in the past as well as presently, they pointed out that “the leadership has been incredibly important” (1a). When teachers looked ahead, different aspects of strategic management were highlighted. In school 5, where the tradition of subject specific teaching and learning was strongest, the advice from one of the teachers was to focus on teachers who are prone to change rather than trying to lift the entire staff. To “focus the power on those who have a longing to make more of this and work more with the 20 teachers who are on the move” (5a).

**Obstacles for ESD**

Three themes stood out as obstacles for promoting the transformative potential of TPD: skepticism, ambiguous management, and the local context.
Skepticism was reflected in comments on how approaches of colleagues might counteract the intentions in the TPD program. This theme was notable in all five schools in the interviews. The skepticism was combined with lack of engagement. “Half of my colleagues participate because they must and are not engaged at all” (2a). A pronounced project fatigue was also expressed. “When we come back after the summer holidays, […] then some new version pops up, or some new idea, or […] I think many teachers are quite shrewd” (5b). The most common ground for skepticism was, however, a perceived and pressing shortage of time. “It’s hard to find time, it’s hard to get acceptance [from colleagues] for this when drowning in everything else” (3a). The risk of the project being dependent on a few dedicated colleagues was mentioned. If the devoted teacher quit, the project ran the risk of losing continuity and possible failure. “It should not matter that people quit, it [the project] should still continue” (1c). In schools 1 and 3, skepticism emerged through statements that the project would only have temporary impact, and that the ideas of TPD would subside. “We have had many different projects over the years and there have been few results, they die out” (3c).

Ambiguous management pertained to how the transformational potential was hampered. It appeared as vagueness, as in school 5, “In fact, I cannot put into words the strategy of the school leaders” (5a), but also as a lack of continuity; rotation of principals being a threat to the intentions of the project. “Now I have my fourteenth principal, and I have worked all my years in the same school district, and all principals have pushed their own ideas” (4a). Another recurrent notion was that the TPD program was a top-down project, run by the school leaders without real anchoring among the teachers. “Yes, it is very much from above also, so that we really have no choice” (2c).

Local context also contained factors hampering the opportunities to develop transformative learning, as illustrated by examples proffered by the teachers; deficiencies in students’ language skills in school 1, being the most prominent example. The teacher proclaimed that the problem was amplified by political decisions. “Politicians allow us to have students here who have poor language skills. Then we have the other schools where they have well-developed language skills. It doesn't go together” (1a).

Established traditions in each specific school may also be of great importance, as expressed by a teacher in school 5. “It's very convenient to continue to do what you always have done, or to run the same track” (5c). In this case, the “track” led to the same education as the students’ parents received some decades ago. This school, with its programs, is a high-status school, but there are other schools with troublesome traditions, which may feed distrust and cynicism among the teachers. “There are many parents here who have a poor experience of their own schooling, and who easily transfer that to their children” (1a).

Critical factors of the implementation process influencing ESD

RQ 3 focused on how the enablers and obstacles of the local school reform had affected the ESD implementation. When combining and comparing the results from RQ1 and RQ2, the characteristics of each school became visible (Table 1), and an analysis was conducted as outlined below.

School 1: The local school context – exchanging ESD for language learning

This grades 4–9 school showed strong indications of both single subject and multidisciplinary teaching, while multidimensional perspectives were rare and emotional learning absent. Two lines of improvement were still identified. First, adding sustainability aspects to previously introduced thematic projects, and second – as an overriding objective – improving students’ Swedish language proficiency. Language improvement was seen as a necessary precondition for students with a foreign origin to learn about sustainability. The ambition was effectuated in thematic projects for SDG, like global use of water, but was also included in the ordinary teaching activities, in separate subjects as shown in Table 1.

Focusing on language improvement was facilitated by the strategic management carried out by the principal and the facilitator and was anchored among the teachers and politicians in the municipality. As the school was characterized by deep trust among the colleagues, who practiced a reflexive dialogue about their daily work, the language development ambition was shared by all and continuously evaluated. The ambition was to overcome the main obstacles, which were the students’ weak Swedish language skills
School 2: ESD blocked by local school traditions
The reform agenda in the grades 4–9 school had generated multidisciplinary projects about food during the first year and about health during year two. The projects were limited to three-week periods at the end of the spring semester, during which individual subject teachers contributed by adding subject-specific perspectives to each theme. The projects included multidimensional elements, like regional comparisons of cultural rules about food, but no elements of emotional learning were identified, and in particular, the action-oriented approach in transformative teaching was missing, see Table 1.

No enabling factor supporting the implementation of ESD was distinguished, and the facilitator did not experience the implementation process to be prioritized by the principal. Notwithstanding, the teachers mentioned motivated students and parents, both nurturing high expectations, as positive characteristics of the school. A skeptical attitude, attributable to a perceived top-down organization of the TPD program, along with ambiguous aims and lack of commitment among colleagues, were articulated as obstacles for the implementation.

A strong tradition of individual teaching in single subjects acted as a hurdle for transformative ESD learning in this school. As the teachers knew little about their colleagues’ classroom practice, it was hard to establish a shared vision for reassessing their teaching approaches and to operationalize different dimensions of sustainability in a transformative ESD. The default mode of conducting multidisciplinary teaching was adding pieces of subject specific knowledge under a particular headline, rather than training systems thinking, evaluation of solutions, and argumentation relating to complex issues.

School 3: On the way to transformative ESD
This grades K–3 school had implemented four thematic multidisciplinary projects. Two of them, art and health, included openings to multidimensional and emotional learning. Thematic teaching dominated, showing weak indications of single subjects and intermediate indications of multidimensional learning (Table 1). No evidence of emotional learning was found. As a whole, the results indicated that this school is on its way toward transformative teaching, but that some pieces are still missing, such as emotional learning.

On the subject of enablers and obstacles to the implementation process, a long-term strategic leadership strongly supported the intentions of the TPD program. Introducing a co-teacher system provided the teachers with continuous opportunities to reflect on their teaching, and trust among the colleagues facilitated implementation of new perspectives introduced into TPD. An underlying skepticism regarding the endurance of the project and the long-lasting effects of the reform agenda was nonetheless also present, but those doubts were toned down, with reference to the current principal acting as guarantor of a long-term strategy. This continuity removed doubts regarding the long-term nature of ESD and strengthened the teachers’ motivation for contributing to the planning process. A predominantly positive view on the reform project, paired with a positive view on the school as a workplace, infused powerful energy into the planning and performance of thematic ESD projects. The lack of an emotional component suggested however that the local school reform project had not yet led to a complete reconsideration of the established and dominant approaches to teaching.

School 4: Great internal differences in adopting ESD
The implementation of the reform agenda in this K–9 school resulted in recurring SDG related projects for limited periods of time, particularly in grades 4–6. A multidimensional project, children in the world, included comparisons over time and space, and an action-oriented project on local traffic safety in grade 2 displayed the clearest example of emotional learning in the study. As Table 1 shows, this school embodied all four categories of learning, but single-subject teaching carried out by individual teachers was the norm.
School 4 is a result of the merging of some smaller local schools, and traces of disparate school cultures from the teachers’ previous workplaces are still present. These coexisting school traditions hampered the process of creating a common vision of ESD. Other obstacles were lack of communication between teachers from different levels (primary and lower secondary levels), and frequent changes of principals interrupted the continuity. The view that TPD was a temporary top-down project with limited duration and effect furthermore seemed to limit the willingness of the teachers to reevaluate traditional teaching. The examples of teaching with transformative elements, like the traffic-safety project, were initiatives taken by individual teachers, and little or no dissemination of experiences and knowledge to colleagues occurred.

School 5: ESD as interdisciplinary and collegial learning
School 5, grades 10–12, was characterized by a predomination of subject-specific teaching, while multidisciplinary, multidimensional, and emotional teaching were scarce. In most subjects, the teachers ran thematic projects linked to SDG, climate change being an overarching theme. Each subject teacher added their own subject-specific aspects to time-limited thematic study objects, and collaboration in teaching teams was rare. One effect of the TPD project was recognizing the need to organize teachers in interdisciplinary teacher groups to facilitate further improvement of ESD. A reorganization in this direction is a strong challenge for a school with long and strong traditions of only subject-specific organization. The convenient tradition, to continue with business as usual, was a clear hurdle for this change to take off. The interviews conveyed definite doubts that the local school project would lead to lasting changes, and the project was by some perceived as one in a series of transient top-down projects without being adequately founded among the teachers. As a consequence, the expected effects of the project were obscure to the teachers, and completely depended on what would be the school management’s next step. However, the TPD program had also inspired a more strategic collaboration between teachers of different subjects, with focus on students’ wellbeing and learning conditions over and beyond the focus on teaching specific subjects.

Discussion
This study investigates how a local niche reform project for ESD sought to implement transformative ESD, and what critical factors and design criteria influenced the outcomes of the intervention. As evident in the results, no school reached the project goal of fully embracing transformative ESD. It is important to recognize that the interviews were conducted about 1.5 years into the project, which means that more than one year was left, and it is possible that teachers might have changed their teaching practices more at the end of the project since school reforms take time (Cohen & Mehta, 2017). However, a 1.5-year school reform project with frequent contacts following the design criteria of Redman et al. (2018) for continuous professional development toward ESD would be expected to have come closer to the goal, so what might the reasons for the lack of success be?

Evaluating the design criteria for continuous professional development
The examined project met the criteria for long-term duration and frequent contacts. But if elements of genuine reconsideration of existing visions and values relating to teaching practices are weak or missing, long duration might reinforce the prevailing structure rather than put it to the test (Cohen & Mehta, 2017). Evidence in this direction was that it was hard to identify a shared vision as a clear driving force for the implementation of ESD in the participating schools, which has been shown as crucial for ESD implementation (Avalos, 2011, Mogren & Gericke, 2019). Further, as pointed out by Evans et al. (2012), school reform toward ESD might need to be negotiated locally during a continuous professional development project. In this study, the negotiation was conducted in the pilot study before the project was implemented, but this might not be enough if the transformative teaching practices are not consistent with the teachers’ existing values (Cohen & Mehta, 2017).
If the visions behind the school reform is unclear and disparate to the teachers, this constitutes an obvious risk for the implementation efforts. Teachers’ strategy to overcome such insecurity seems to be to maintain traditional academic styles of teaching. Also, insecurity about the vision invites ambitious attempts by leading teachers to pursue a specific agenda, like the exclusive focus on language development in one school. To conclude, although most of the continuous professional development efforts in the project concentrated on introducing what transformative ESD is, and why and how it can be implemented, it was hard for the teachers to express a common vision for the project. An important finding of this study is therefore that the seven design principles of continuous professional development of sustainability education (Redman et al., 2018) should be complemented with a criterion for creating and negotiating a shared vision. It is not enough that a TPD program is engaging; it also needs to be negotiated and agreed upon as a common vision by the participants. Only then can it be agreed upon that the ESD school reform can offer solutions to problems teachers themselves recognize (Cohen & Mehta, 2017).

The deficiency of a shared vision can also be explained by the school reform’s lack of a clear connection to a theoretical framework. The lack of theoretical references in the interviews signaled that the theoretical underpinning of the TPD program had been too general to engage the teachers and to generate real changes in their practice. Redman and colleague’s (2018) criterion, based on Timperly (2010), that theory and practice must be linked was not operative, as most sustainability content was adapted to single-subject traditions rather than to theory instructing how to conduct transformative ESD. A reason for this might be that the professional development leaned much on UNESCO (2014, 2017) policy documents in which definitions of ESD are very broad and inclusive. Research literature presenting different models were also available, but not obligatory. In school reforms involving transformative ESD it seems crucial to include an explicit theoretical framework that can provide an initial touchpoint for discussions aimed at developing a shared vision.

To acquire key competencies in sustainability, Redman et al. (2018) underscore the need to exchange the traditional information-deficit model of professional development for a stronger focus on procedural and normative knowledge. The absence of this shift in the studied schools may also explain why traditional academic styles of subject-specific teaching prevailed at the expense of multidisciplinary, multidimensional, and emotional learning. It seems as if the procedural and normative learning elements were rare, and the teachers lacked an infrastructure (Kennedy, 2016), i.e., educational material and guidelines, to turn the ideas of transformative ESD into practice, although practical aspects of, for example, interdisciplinarity were explicitly addressed in the TPD program. Here, we identify a problem with the bottom-up perspective that often is favored in transformative ESD (Mazon et al., 2020). In a quest to avoid normativity and let the teachers be their own agents of change, more normative elements of ESD are often avoided, which are part of the infrastructure and deemed important if a local school reform is to succeed (Cohen & Mehta, 2017).

Evaluating critical factors for implementing transformative ESD

Among the factors that either facilitated or complicated the implementation of transformative ESD, the present study points out trust, reflexive collaboration, and strategic management as the most important enablers, and the most obstructive factors as skepticism, ambiguous management, and local context. These are similar to and confirm results of school reform studies in other areas than ESD (e.g., Kilbane, 2009; Sandholtz & Ringstaff, 2016). Trust between the various actors in a school seems to be of utmost importance when pervasive changes are to be implemented, as shown by our results. A school where trust prevails is closer to establishing a shared vision than a school where skepticism prevails. In schools 1 and 3, where trust was a prominent theme, the predominance of subject teaching was weaker, and the openness to multidimensional and emotional teaching was more pronounced. Strengthening the trust between a school’s actors thus appears to be a key ingredient in local school reforms nurturing a transformative ambition, which is consistent with earlier suggestions by Starratt (2005). Strategic leadership should accordingly aim at building trust between groups with traditions of weak collaboration, such as between teachers with different subject affiliations, and also between the school and its surrounding social context. This is of particular importance since each school’s geographical vicinity encompasses the most easily
accessible arenas for training active citizenship. This is what the action-oriented project concerning traffic-security in school 4 illustrated. There is evidently a rich pedagogical potential in the local context of every school, and it is only by unlocking this potential that perceived obstacles can be constructively problematized – and turned from obstacles into enablers.

**Conclusion**

A concluding recommendation is that a school reform for transformative ESD needs to be explicitly communicated according to a distinct theoretical framework and then constantly be open for negotiation with the teachers during continuous professional development. The complexity of ESD seems to blur the intentions of the school reform, which might be quite different from other more conventional topics commonly implemented at school, such as subject learning related to more specific outcomes in, for example, language, mathematics, and science. Therefore, *creating and continuously negotiating a shared vision and building trust* seem to be fundamental for implementing transformation oriented ESD. This threefold design criterion should be considered in addition to the other criteria for continuous professional development previously identified by Redman and colleagues (2018). Consequently, a local school reform project should introduce a framework that has the capacity to build trust and a common vision in the school. In addition, it must be feasible to translate that framework into teachers’ practices in a clear and unambiguous way. This is essential because the complexity of ESD seems to be one of the main obstacles for developing a useful infrastructure including educational material and guidelines.

**Notes**

1. Action competence is here defined as a potential competence that is voluntary and aimed at bringing about a sustainable change (Sass et al., 2020).
2. The rows 1–4 refer to themes, marked in bold, illustrating the four components in transformative ESD, according to Eilam and Trop (2010). The *italics* indicate how common each component was at each school. The scale is: Dominating, Strong indications, Intermediate indications, Weak indications, No evidence. Rows 5 and 6 refer to the themes (marked in bold), identified as enablers and obstacles for ESD. Normal text indicates local flavor of that theme in the specific school.

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