



# Guiding Principles of Transformative Education for Sustainable Development in Local School Organisations

Investigating Whole School Approaches through a  
School Improvement Lens

Anna Mogren

Faculty of Health, Science and Technology

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Biology

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DOCTORAL THESIS | Karlstad University Studies | 2019:33

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## **Abstract**

The importance of an education that empowers students to engage with real societal problems to promote a sustainable future is widely acknowledged. The organizational characteristics of schools that facilitate such education for sustainable development (ESD), however, have received little attention. This thesis aims to fill this research gap by contributing new knowledge on ways that school organisations can implement transformative ESD, aligning with a whole school approach.

The study design used a mixed-method approach developed from the field of school improvement research. Swedish upper secondary schools that were actively implementing ESD were selected to investigate guiding principles for implementing transformative ESD. School leaders' and teachers' understanding of quality in their local school organization was studied. Methods included semi-structured interviews with school leaders and questionnaire studies with teachers.

The thesis identifies guiding principles for implementing transformative ESD. For school leaders, these include the importance of maintaining high quality in their school organisations, and structural support in the organisation to establish a holistic idea and encourage collegial meetings. Together, these guiding principles support that the whole school organisation is framed, interlinked and contributing to teaching and learning practices in ESD active schools.

Two main conclusions of the thesis are, first the identification of the local school organisation as the firm ground for implementation of transformative ESD. The second conclusion is that the internal school organisation is found to be a prerequisite for the schools' collaboration with the surrounding society. A student-centred approach in organizing education was found to facilitate such links between education and the outer society, which is a main goal of ESD according to policy and theory. The results may provide useful recommendations for schools and ESD implementation programs.

## Acknowledgements

Having the opportunity to undertake doctoral studies and finish a thesis with my name on it has been an immense privilege, which would not have been possible without the support of many people around me! From day one as a doctoral student there has been help and guidance from so many sources that it is impossible to mention them all, but I would especially like to express my acknowledgement and gratitude to the following people who provided various kinds of help.

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My research sought the 'firm ground', which will not be eroded or disappear, required for implementation of transformative ESD. I am lucky to have my own firm ground at home, which provides constant support and for this I offer the greatest gratitude and thanks to my patient and wonderful family. Noel, Marta, Lisa and Nora, the extended family and my beautiful listening, interested and funny friends: I cannot express your importance in my life!

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Anna Mogren, Kinnekulle, 15 november 2019

## **Abbreviations**

ESD        Education for sustainable development

WSA        Whole school approach

QC         Quality criteria

TQ         Transformative quality



## Foreword

“Courage depends mainly on the will to be brave” (Ellen Key)

I am inspired by my years working in the education sector. I have met many clever and ambitious school leaders and teachers who use their profession to make the world a better place. I find that many of them make vital decisions to let young individuals have possibilities for self-realisation and to contribute to development of the future they desire. Their actions, positions as leaders and influence on education interest me. The desire to learn more about the role of leadership in schools’ organisation was the starting point for my journey as a doctoral student.

This is a study on brave leaders and teachers who have adopted the sustainable development agenda in their schools and classrooms. Their ambitions extend beyond including sustainable development as curricular content; they also strive to instil in young individuals the abilities they need to apply their theoretical knowledge in society. It is a mission to understand and implement transformative education for sustainable development (ESD) in their schools. I can conclude that their task is difficult, but there are many ways to tackle the challenging task to induce the required fundamental changes in education, and introduce a new, and urgently required, educational paradigm.

This study contributes to efforts of elucidating the kind of school organisation that can promote education that empowers young individuals to participate in building a sustainable future. The results and recommendations presented in this thesis are based on the courage and will of school leaders and their teachers to try brave new ways of planning and managing education. Some changes are extensive while others are small steps in the direction of educational change.

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## List of papers

This thesis is based on the following four appended papers, which are referred to in the text by the corresponding numbers.

Paper 1:

Mogren, A., & Gericke, N. (2017). ESD implementation at the school organisation, part 1—investigating the quality criteria guiding school leaders' work at recognized ESD schools. *Environmental Education Research*, 23(7): 972-992. doi:10.1080/13504622.2016.1226265

Paper 2:

Mogren, A., & Gericke, N. (2017). ESD implementation at the school organisation, part 2—investigating the transformative perspective in school leaders' quality strategies at ESD schools. *Environmental Education Research*, 23(7), 993-1014. doi:10.1080/13504622.2016.1226266

Paper 3:

Mogren, A., Gericke, N. & Scherp, H-Å. (2019): Whole school approaches to education for sustainable development: a model that links to school improvement. *Environmental Education Research* 25(4), 508-531. doi:10.1080/13504622.2018.1455074

Paper 4:

Mogren, A., & Gericke, N. (2019). School leaders' experiences of implementing Education for Sustainable Development—Anchoring the transformative perspective. *Sustainability*, 11(12), 3343. doi:10.3390/su11123343

## **Authors' contributions**

Anna Mogren, Niklas Gericke and Hans-Åke Scherp jointly developed the research ideas, the research design and the research questions addressed in Paper 1-3. The research design in Paper 4 was jointly designed by Anna Mogren and Niklas Gericke.

Anna Mogren collected the data in all the studies, and was responsible for the qualitative and quantitative statistical analysis with support from Hans-Åke Scherp.

Anna Mogren was the main author and wrote the first draft of all four papers. She interpreted the results of the analyses together with Niklas Gericke, who also contributed to subsequent drafts of the four papers.

## **Disposition of the thesis**

This thesis is a compilation thesis consisting of an introductory chapter ('kappa' in Swedish) and four papers. The introductory chapter describes the background of the research presented in the papers, outlines the methodological approach, then summarizes the results and considers them in relation to previous empirical findings and theory. The methodology applied in studies reported in the first two papers, and the results obtained in them, were previously presented in the licentiate thesis entitled "Implementing Education for Sustainable Development: A study of school leaders' understanding of high quality in school organisations" (Mogren, 2017). The introductory chapter provides an overview of theoretical frameworks and conceptions (rooted in both ESD and school improvement research applied to study organisational issues related to transformative ESD) and the findings reported in all four papers.

## Introduction

Human actions in the Anthropocene era, which are causing potentially cataclysmic changes, have created urgent needs for much better ways to handle socio-economic and cultural development. Switches to renewable resources, greater focus on human welfare, and more suitable economic instruments to steer society are urgently needed to form a sustainable future for us all (Manni, 2018; Steffen, et al., 2015). *Education for Sustainable Development* (ESD) is an educational response to the need to empower students to deal with the complex challenges associated with sustainable development of current and future society.

In school organisation research, an 'ESD perspective' refers to orientation towards and promotion of ESD and related principles<sup>1</sup> in the whole school's organisation, i.e. students, teacher and school leaders (Abrahamsson, Berg & Wallin, 1999). Few studies have addressed more than one group of individuals involved in education at a time. To address this gap, this thesis considers the ESD perspective holistically, across disciplines and all persons involved in the schools' organisation. For this purpose, respondents including both school leaders and teachers were selected. Key concepts in this thesis and the underlying studies (as well as the data collection and analysis methods, and framework chosen to display the results) are all rooted in the core objective to study ESD holistically.

This thesis addresses the new paradigm of *transformative ESD* and its links with organisational characteristics of schools. Transformative ESD is intended to encourage young individuals, children and students, to become active participants in building new and better societies even before they leave school (Ärlemalm-Hagsér & Engdahl, 2015; Barrineau, Engström & Schnaas, 2019, Jickling & Wals, 2012; Wals & Jickling, 2009). However, there are many practical challenges in implementing an ideal or normative concept of ESD, and to make it institutionalised in educational systems.

The thesis identifies educational qualities and principles that seem to support implementation of transformative ESD in a school's organisation. It is a process of forming education based on critical reflections on contested beliefs, taking action and critically assessing its outcome and thereby transforming educational frames of references in schools' organisation (Mezirow, 1997).

Characteristic expressions of quality in the school organisation that support transformative education are core concerns in this thesis. These transformative qualities differ from qualities that promote establishment of firm structures and routines in ESD implementation, which raise risks of the education failing to provide the sensitivity to changes and needs of the society that is a core feature of transformative ESD (Lotz-Sisitka, Wals, Kronlid, & McGarry (2015). However, there is also a challenging need to maintain and institutionalise the process-driven ESD implementation that is based on

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<sup>1</sup> Principles in this thesis is a collective term used to communicate a variation of results in the sub studies of this thesis. Guiding principles are components found supportive in the school organisations for implementation of transformative ESD.

transformative ESD (Giles & Hargreaves, 2006). According to Bengtsson and Östman (2013), ESD implementation in practice often becomes structurally ossified and hegemonic as a result of compromises and collaboration, often between contradictory opinions and sometimes political philosophies. There is a clear need to know more about activities and organisational characteristics that support implementation of transformative ESD, based on the schools' own practice and everyday life.

Over the years there have been various evaluations of the outcome of ESD, but weak indications of its effectiveness have been obtained (Berglund, Gericke & Chang Rundgren, 2014; Boeve-de Pauw & Van Petegem, 2011a; Boeve-de Pauw, Gericke, Olsson & Berglund, 2015; Warner & Elser, 2015). Moreover, only small-scale projects have been demonstrably successful (Laurie, Nonoyama-Tarumi, McKeown & Hopkins, 2016). Thus, in the studies this thesis is based upon, guiding principles for transformative ESD were sought in the school organisation rather than searched by the individual learner. Characteristics of schools' organisation were sought, i.e. the structural elements, planning, management and practices in schools that promote ESD implementation. These are crucial, but often neglected features, because the school organisation frames arrangement of education, i.e., all the day-to-day administration, staff development, routines, processes, networking and managerial procedures of a school (Mogensen & Schnack, 2010). All of these features may help or hinder educational transformation (Stables & Scott, 2002; Sterling, 2004b). Nevertheless, how the school organisation supports (or obstructs) ESD implementation has received little research attention, despite extensive acknowledgement of its importance in ESD implementation (Scott, 2013; Leo & Wickenberg, 2013; 2014).

The attempt to identify guiding principles for implementation of transformative ESD involved comparison of schools in Sweden with acknowledged success in implementing ESD ('ESD-active schools') and others. Methods developed and applied in school improvement research were used to identify organisational conditions and emphasised principles in the studied ESD-active schools. Previous research on ESD implementation has mainly considered *if* ESD is present in education (Cincera, Boeve de Pauw & Goldman, 2018; Rickinson & Reid, 2016), while the focus here is on *how* transformative ESD is incorporated in education. The research question guiding the overall work can be briefly summarised as *What guiding principles in the school organisation promote implementation of transformative ESD?*

The research underlying this thesis was interdisciplinary as it involved aspects of both ESD and school improvement research. The two fields provide complementary approaches that enable synergistic explorations and analyses beyond the scope of either field alone. School improvement research provide new ways to study processes of change in the school organisation that can improve the quality of the provided education (Ekholm & Lindwall, 2008). Tools developed in school improvement research were used to broaden knowledge of how a whole school approach (WSA) of ESD could be used and understood in future research on implementation of transformative ESD. Frameworks and conceptions on school educational change rooted in the two

research fields (ESD and school improvement) can be linked through their focus on change and process in education, although there is a much stronger focus on connecting the internal school organisation to the outer society in WSA ESD conceptions than in school improvement frameworks. WSA ESD has developed as an ideal within the ESD research field that can purportedly provide a conducive framework for high-quality transformative ESD (Jucker & Mathar, 2016). Moreover, ESD research has greatly extended in recent years, but parallel to other fields dealing with education and educational change. Thus, there is a risk of efforts to reach a sustainable future fixating on societies' development and failing to influence the development of *education* systems (Sund & Lysgaard, 2013). *Inter alia*, the thesis discusses advantages of bridging the research fields through a WSA ESD, as earlier suggested by for example the ENSI network for future research (Wals, 2018).

The overall aim of this thesis, is to contribute new knowledge on ways that schools' organisation can support permanent implementation of transformative ESD. The results may provide useful recommendations for schools and general ESD implementation programs. The following sections outline ESD policy and research. Next, the concept of educational quality and associated analytical criteria are defined, as well as the study object: school organisation (particularly WSA approaches to ESD). Collectively, they outline the theoretical framework in the separate studies that this thesis summarizes.

## **Background**

ESD is supposed to enhance awareness of global sustainability and build a solid foundation in education for future generations to act more wisely (Wals, 2015). However, the issues are far from straightforward, and ESD researchers have intensely debated the ideal nature of ESD, how it can be enacted, and embedded in wider educational arenas (Vare et al., 2019). According to Scott (2013) there is a need to broaden knowledge of characteristics of local school organisation to optimize internal support and provide ‘firm ground’ for implementing ESD. Scott refers to the firm ground as a position where the school organisation is open to change by an established vision, allocation of resources and where the organisation is part of a “*social learning community with a systemic view of the world...as development will not take place in a progressive way unless there is firm ground*” pp. 189.

More insights into how successful ESD is managed in the school organisation is needed to improve understanding of principles that enhance learning, and transformation in education that embraces and disseminates an ESD perspective (Lotz-Sisitka et al., 2015). However, research on relationships between organisational features of schools and implementation of ESD remains sparse (Boeve-de Pauw et al., 2015; Mogensen & Schnack, 2010). The following sections outline concepts used in this thesis, and the underlying research, to address this research gap.

### **ESD policy**

Policy documents are generally based on compromises and negotiations about how to introduce something new, e.g., the ESD perspective in education. In practice, an implementation plan usually follows documents stating relevant policy (Curran & Hollander, 2002). Practical implementation of ESD is therefore sometimes said to be political or incongruent with research findings regarding measures that support ESD implementation (Bengtsson & Östman, 2013; Hasslöf, 2015; Sund & Öhman, 2014). Various ways to implement ESD are therefore presented and discussed in this thesis.

The description of the research field of ESD and how it has developed over time starts in the policy documents that have developed along with and become intertwined with new research on ESD. In the following paragraphs international-, national- and local-level ESD policy is presented, as well as the context of ESD implementation, before the ESD research literature is reviewed.

### ***International policy***

Key international efforts to promote sustainability are encapsulated in the UN’s Sustainable Developmental Goals (SDGs). These summarize 17 multilateral stakeholder-level initiatives to ensure global sustainability by 2030, in accordance with Agenda 2030, as agreed by world leaders in 2015. The 17 goals are intended to end poverty, fight inequality and stop climate change (UN, 2019). SDG 4 concerns educational quality, and (*inter alia*)

promotes *education for sustainable development and global citizenship*. It states that by 2030 the UN should ensure that:

“all learners acquire the knowledge and skills needed to promote sustainable development...through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development”. (UN, 2019, goal 4.7)

As the UN’s General Secretary, António Guterres, stated “the 2030 Agenda is our roadmap and its goals and targets are tools to get there” (Guterres, 2018, para. 33). Hence, each SGD in the Agenda 2030 framework can be linked to more specific policies. An initiative that is closely linked to Agenda 2030 is the UN’s Global Action Programme (GAP) for ESD (UNESCO, 2014c). Agenda 2030 is a policy document intended to cover all aspects of socio-economic and cultural development, while the GAP is a plan for implementing ESD, e.g., for incorporating the global goals in Swedish education. The United Nations Educational, Scientific and Cultural Organization (UNESCO) runs the GAP. ESD is recognized as a key element of quality education in the GAP programme and a crucial enabler of sustainable development. One of the priorities of GAP is to “transform learning and training environments” (ibid, pp. 18). To succeed, UNESCO promotes the Whole Institution Approach (WIA) to ESD in schools and suggests that all other learning and training should encourage sustainability in every aspect of school life and in the whole school organisation (UNESCO, 2014c). The programme expands the idea of ESD not just as a way of teaching and learning in education, but also as a way of managing and planning the school organisation. During the writing of this thesis in 2019, the Swedish National Agency for Education was mandated by the Swedish government to increase knowledge of international policy on the SDG in a national Swedish education context (Swedish National Agency for Education, 2019).

### ***National policy***

Sweden, like many other countries in Europe and elsewhere, has no separate governmental policy document on ESD. A government inquiry entitled *To learn for sustainable development* was conducted in 2004 in response to international agreements on ESD (SOU 2004:104), but it did not affect the mandatory work with ESD in formal education. An optional national implementation scheme was established by the Swedish National Agency for Education (2015) 10 years later that could be applied in schools. In conclusion, the Ministry of Education in Sweden, has not prioritised promoting the ESD perspective relative to other educational areas in terms of allocated resources (Jidesjö, 2014). However, the national curricula (Swedish National Agency for Education, 2013) expresses support for ESD implementation.

The Swedish curricula state that both social responsibilities and environmental concerns are important in education. Sustainable development is part of the overall perspective of education outlined in introductions of the national curricula. In addition, the secondary school course plans (Swedish

National Agency for Education, 2013) generally include ESD-related issues in the examination goals to ensure the theme is covered in Swedish pupils' education. For example, the curriculum for the Health Care Programme states that, "Knowledge on basic democratic values and international agreements about human rights is important in the activities that the education prepare for" (Swedish National Agency for Education 2013, pp. 39). In another example, the curriculum for the Natural Science Programme states that, "Education shall develop student knowledge and skills in natural management that promotes a sustainable development and nurture the ecological systems, local as well as global" (Swedish National Agency for Education 2013, pp. 47).

In conclusion, the national curricula support ESD. However, it can also be argued that the more direct steering at national level in Sweden in support for ESD is weak. For example, in-service training for teachers and school leaders is insufficient, as noted in national reports (Uppsala University, 2018). Moreover, ESD issues are not explicitly monitored at all in national testing and national school inspections (which are supposed to maintain the quality of education for students in all schools and ensure that curricular requirements are met).

### ***The context of ESD implementation***

The national policy on ESD in Sweden and other countries provides incentives for research on ESD implementation. This section outlines findings from research on ESD implementation to set expectations regarding what can be understood by studying the process.

The Environment and School initiatives (ENSI) network, previously active in three continents, has a long history of investigating ESD practical inventions in terms of 'what works' in praxis in various school contexts (Breiting, Mayer & Mogensen 2005; Mogensen & Schnack 2010). In the fast-developing research field of ESD, ENSI provided arenas where theoretical ideas were tested and evaluated in practical settings (Affolter & Varga, 2018). Examples include work on connecting student empowerment, participation and democracy in education with concern for the environment (Walker 1997). Through activities within the network, fundamental issues about the nature of knowledge were raised, not just theoretically but at the interface between theory and practice, and actions that promoted successful ESD implementation (Wals, 2018).

In an evaluation of seven nations' attempts to implement environmental education and ESD in a network of eco-schools, several common characteristics of quality have been suggested. One is ensuring that the school policy and organisation allocate the time and resources required to ensure that ESD is adopted in ways that build on student and teacher engagement. Another is regular appraisal of new challenges related to ESD and actions connected to its implementation in the school organisation. Others include: everyone (students, teachers and school leaders) feeling that they are safe and can contribute to new ideas and be innovative; displaying educational results obtained to the external community (in line with qualities stressing the importance of collaboration with society in ESD implementation); and use of

the local society as a learning arena for action and reciprocal exchange of knowledge (Breiting, et al., 2005).

Empirical research provides foundations that schools can use for self-evaluation and assessment of their long-term development towards more fruitful implementation of ESD (Breiting, et al., 2005; Grice, Mogren, Grantz & Gericke, 2018; Mogensen & Schnack, 2010). An empirical investigation of ESD implementation in Belgian schools showed that actions in the school organisation play an important role in modulating adverse effects of gaps between the policy and practitioner levels of ESD (Boeve-de Pauw & Van Petegem, 2011b). The use of policy-making capacities to evaluate ESD effects in eco-schools in the cited Belgian study is one example of how schools can be investigated in relation to school leadership and school organisation. Boeve-de Pauw & Van Petegem (2011a) describe policy-making capacities as aspects of school organisation that can be used to improve quality in education. They identified *effective communication, shared leadership, and school culture that shares a vision* as important in this context. Another eco-school evaluation by the same authors (Boeve-de Pauw & Van Petegem, 2011b) showed that attempts to implement ESD in selected eco-schools had only weak and sometimes negative effects on students' perceptions, although use of policy-making capabilities to support the implementation reduced the magnitude of the negative effects. These results arguably demonstrate the importance of both school leaders and the school organisation in successful implementation of ESD.

In a Swedish study on the role of school leadership in ESD-active schools, Leo and Wickenberg (2014) identified what they call norms promoting ESD implementation. They argued that these norms typically represent qualities used to reach specific ESD goals within school curricula. The school leaders included in their study mainly used the professional norms of ESD to establish consensus among their staff regarding the ESD perspective in education. Other examples of professional norms identified by Leo and Wickenberg (2014) include a common vision of ESD in the school and creation of arenas for support and raising understanding of central concepts of ESD. Leo and Wickenberg further suggested that ESD could be used to improve quality in education as a whole and not just in specific ESD areas.

Posch (1999) and Elliott (1999) proposed the use of ideas regarding the environment and sustainability as catalysts for renewal of education and healthier lifestyles. Other authors have also addressed the scope for applying conceptual work on ESD to drive renewal of education. Most importantly, in the context of this thesis, Nickel and Lowe (2010) presented a theoretical outline of quality in relation to UN policy documents on ESD (UNESCO 2014c), and a model that could be used to drive quality, in which sustainability is one of seven suggested dimensions. The cited authors claim that the other six dimensions - efficiency, equity, responsiveness, relevance, reflexivity, and effectiveness - are required for the sustainability dimension to contribute to quality. The approach presented by Nickel and Lowe (2010) to study ESD implementation through a 'quality in the school organisation' lens inspired the research that this thesis is based upon.

Scott (2013) presents a similar relationship between quality and sustainability in an attempt to identify progress descriptors for ESD. He suggests that most descriptors of ESD implementation could be described as generic school qualities with only a few direct connections to sustainability. He then identifies a set of descriptors that appear to be important for high quality school leadership. One is a vision living in the school organisation. Another is a school culture that embraces: collective and shared responsibilities, openness and collaboration with the local surroundings, incorporation of sustainability issues as an essential part of education (rather than a fragmented add-on), and orientation towards changing learners' behaviours and creating capacities for critical and independent thinking. Identification and characterisation of specific guiding principles that constitute such prerequisites for implementation of transformative ESD in the school organisation were the main aim of the research this thesis is based upon. Scott (2013) would call it a search of the firm ground.

The way the ENSI network, based on empirical and theoretical research on ESD implementation, was used to test and share ideas on ESD implementation has influenced and developed thoughts on key elements of effective ESD implementation (Wals, 2018). Consequently, empirical research on ESD implementation addresses broader issues than the content and educational perspective related directly to ESD, including practical aspects of how it helps to raise overall quality in school development. As Wals (2018) noted, when summarizing work by the ENSI network:

“What has become clear over the years is that successful school development is co-operative and participatory and needs to be a part of a wider societal or social movement or, as we say today, part of a transition towards more localized, semi-autonomous ‘off-the-grid’ but networked systems. Such systems require forms of reflexive self-regulation, high levels of trust in the capabilities of all involved and freedom to learn and experiment.” (pp. 246)

Within ESD research, the WSA is an example of how this idea of cooperation between education and the outer society is developing. Studies on whole school approaches have paved the way for a more systemic approach to the role of education in building sustainable societies (Wals 2018). Also, the research work outlined in this thesis introduces WSA ESD and argues for its advantages as an optional concept in studying ESD implementation.

### ***The local Swedish context of ESD***

Swedish schools (the foci of this thesis and the studies it is based upon) are steered by national school legislation and policy documents on curricula and syllabi (SFS, 2010). School management is decentralised and steered by local school boards. Around 25% of the secondary students in Sweden attend private schools (often called ‘free schools’), but all schools follow the same national curricula. Every school (run privately or by the municipality) is granted high trust and professional freedom to interpret the national curricula. This provides opportunities for alternative ways of implementing and interpreting passages on ESD in the curricula. A large scale questionnaire-based survey

study of upper secondary schools across Sweden found substantial differences in how teachers of different subjects enacted ESD in their teaching (Borg, Gericke, Höglund & Bergman, 2012). Natural science teachers are highly steered by a normative ('rights and wrongs') approach to ESD. For example, they expected students to choose and use environmentally friendly energy sources if they were told about environmentally damaging sources and the options. Teachers of civic classes were found to use more socio-cultural expressions regarding ESD, for example, linking climate-related issues to their schools' geographical regions. In summary, ESD in local classrooms is strongly affected by the teacher in charge, who has a curricular obligation to incorporate an ESD perspective in education. In addition, the local school leader is responsible for implementing national school curricula and both allocating resources and following recommendations issued by the local municipality school board.

Leaders at every school in Sweden report to the municipality regarding the educational quality their schools attain in relation to national demands and within constraints imposed by the local budget. Resources assigned to education on local level can be partly adjusted to schools' needs by the municipality school boards. If a school wishes to strengthen its work on ESD, local school boards have the possibility to support such an initiative. Conversely, of course, local level authorities can challenge schools' ESD implementation based on their agenda for school development.

Evaluations show that ESD implementation in Swedish schools on a local level is largely seen as voluntarily by the municipalities and the local school boards (Swedish Society for Nature Conservation, 2014). Thus, the ESD perspective is unevenly implemented in Swedish schools.

To summarise Swedish ESD policy, it is supported in the local school organisation by national policy documents, but there are no national follow-up activities and checks or compliance. Possibly at least partly for this reason, ESD is unevenly implemented among and within schools. Thus, efforts of individual municipalities, local schools, school leaders and teachers determine the nature and quality of ESD implementation in Sweden today. Another important reason for modest ESD implementation in Sweden, according to SWEDESD (the national coordinator of the previously mentioned GAP) is a lack of knowledge of ESD, and how it can be implemented in schools (Uppsala University, 2018).

## **ESD in research**

This section briefly reviews shifts in perceptions of ESD over time, and how they have prompted interest in understanding ESD as a transformational perspective in education, which is clearly important for addressing the focal concerns of this thesis.

Nature education', 'conservation education' and 'environmental education', which peaked in the 1970s and 1980s (McKeown & Hopkins, 2003), dealt mainly with the problems of human overconsumption of natural resources. They all involved an ecological perspective of nature, and the primary associated research areas concerned problem-solving and how

education could be incorporated in initiatives to restore nature. The teaching was mainly normative and aimed to modify behaviour. Nature education and the subsequent environmental education have been criticised for separating nature conservation and socio-economic sustainability from the importance of ecological values for human welfare (Jickling, 1994). Jickling (1994) criticized the role of education and proposed a specific direction in education, “in a rapidly changing world we must enable students to debate, evaluate, and judge for themselves the relative merits of contesting position” (ibid. pp. 239).

A shift from an environmentally-centred approach in education towards an ESD perspective started in the 1990s (McKeown & Hopkins, 2003; Stevenson, 2006). The shift involved a turn away from problem-solving in education to focus education on challenges and opportunities stemming from developments in society. A wider embrace of the ESD perspective also occurred that included social and economic issues. The driving force in creating new knowledge on ESD lay in the identification of what was unsustainable, but the means to the ends of sustainability were regarded as complex. Hence, the identification of unsustainable lifestyles was advocated to help efforts to identify what should be sustained and thus the direction of ESD (Mc Keown & Hopkins, 2003).

Smyth (1995) noticed the uncertainty in a call to work towards a *sustainable future*, that was fuzzy, rapidly changing and seen differently by different stakeholders. This led to a less rigid perception of ESD that could clearly be connected to problems that already had arisen. However, risks of the social and economic focus of ESD leading to underestimations of ecological constraints limiting sustainable development options were raised, and Smyth's (1995) early claim that ESD should be proactive, rather than reactive, to the environment by avoiding problems to arise instead of cleaning up afterwards was questioned. The critique of ESD having vague relevance and purpose resulted in extensive research on definitions of the ESD perspective (Jickling & Wals, 2012).

To avoid the more normative environmental education perspective and fuzziness of ESD, the term *Environmental Sustainability Education* (ESE) was suggested (Laessoe & Öhman, 2010). ESE opens up research perspectives based on practical needs, as stated by Sund and Lysgaard (2013, pp. 1609): “empirical research based on practice can be a way of moving the research field forward”. They perceived an urgent need to align the research field with other fields of education and education philosophy research, thereby enabling synergistic use of the findings. ESE was presented as a tool to enhance educational processes, rather than a means to reach society's expectations, partly through viewing mistakes as learning opportunities and explorative actions as important elements of education (Sund & Lysgaard, 2013).

Since the beginning of the 21st century, there have been numerous studies on ESE-related challenges and optimal ways to support students, teachers and actors who plan and conduct ESE in practical settings. The studies this thesis is based upon were aligned with empirical ESE research on how education is best supported by the school organisation to facilitate transformative ESD. However, the term ESD is used here as the results are

intended to provide guidelines in policy arenas where implementation programs and plans are formulated. ESE is mainly a term used in research while ESD is more commonly used in practical implementation.

### **Linking ESD policy to ESD research**

The policy documents and actions on ESD can be linked to the development of the perception of ESD, as previously described. ESD research has switched from initially concentrating on educational content with high potential to influence human behaviour to promote sustainability. This content- or fact-oriented tradition of ESD was aligned with early policy expressed in Agenda 21, an UN agenda to promote consideration of ecological, economic and social issues in national (and supra-national) development plans (UNCED, 1992). A subsequent policy document, *A decade on ESD* (UNESCO, 2014a), recommended enhancement of teacher and student competencies that promoted action towards sustainability. Another relevant aspect, action competence, was introduced into the research field by Jensen and Schnack (1997). They described this as capability to train students in critical thinking by involving them in collaborative actions with others, thereby enabling learning about responsibility by collectively judging the action outcome. Action competence is also mentioned as a desirable capacity in recent ESD policy documents (UNESCO 2014a).

The switch in the primary focus of research from how ESD could contribute to direct change in sustainability, to change and process in education (and associated theory), prompted increases in studies on implementation of ESD (Berglund, Gericke & Chang Rundgren, 2014; Leo & Wickenberg, 2013). This was followed by research on scaling ESD from individual examples to extensive distribution of the ESD perspective in education (Mickelsson, Kronlid & Lotz-Sisitka, 2018). New ESD policy supported the switch in focus towards promotion of the ESD perspective (UNESCO 2014c), but research has found at best weak indications that the new policy-level focus of ESD has had any impact on students' knowledge (Olsson, 2018).

Implementation schemes and programmes are often a consequence by policy documents. Comprehensive implementation initiatives was launched as a response of the early policy writings on ESD (Reid, Nikel & Scott, 2006). The large scale changes of education where ESD was identified as a main driver did not materialize. Only a few good examples on how the educational perspective in ESD contributes to quality in education is reported on (Laurie et al., 2016). In their international study, researchers from 18 countries answered questions on for example how ESD could update and improve educational purposes and outcomes and help to improve and enrich school curriculum development.

School improvement research tools that enable analysis of broad and general qualities in a school's organisation are independent of the guiding ESD policy in the school. They can therefore be used to explore how a specific ESD policy affects education quality, and have proven utility for formulating advice for school improvers, teachers and school leaders (Brown, Duffield &

Riddell, 1997). This can facilitate fine-tuning of ESD implementation in line with increases in qualitative knowledge of ways to stimulate educational change (Lotz-Sisitka et al., 2015). What is meant by implementation of transformative ESD has already been examined, for example in a review by Boström et al. (2018). The studies carried out and summarized in this thesis contributed by empirically analysing the nature and permeation of an ESD perspective in schools' organisation, and can be said to have tested the validity of the potential of transformative ESD approaches expressed in relevant policy documents (GAP, 2017).

### **The concept of quality**

To describe *how* ESD is expressed in a school's organisation, as addressed in this thesis, the concept of educational quality is used. In education philosophy research this is divided into first and second order quality. First order quality refers to objective variables that can be understood without human validation, for example content in a schedule, size of a classroom or number of teachers in a class. Second order quality involves human judgements (Pepper, 1926). Second order quality is experienced by individuals, e.g., school leaders (respondents representing the schools' organisations). Both qualities affect the way teachers and school leaders organize education. Nickel and Lowe (2010) distinguish these qualities by calling first order quality *coherence and strong leadership* and second order quality, *variation and distributed leadership*. This thesis focuses on second order quality in its search for requirements for what is called transformative quality here.

The concept of quality plays a strong role in the Swedish educational tradition. For example, all the heads of education at municipality level report on the quality of their schools annually, based on school leaders' reports. However, Berg (2010) found that school leaders have differing perceptions of the quality concept at both Swedish municipality and regional levels. He underlined the importance of a common understanding of quality in education to identify negative qualities that should be avoided in organizing education. Without an understanding of qualities that support various educational aims there is a clear risk of educational organisation being based on qualities derived from general economic or political trends rather than educational evidence (Lundgren, 1992).

The quality of ESD refers here to the degree that contexts, methods, and processes strengthen the ESD perspective in education, especially the transformative ESD perspective. As noted by Vare and Scott (2007), as well as many other researchers (e.g., Björneloo, 2007; Nickel & Lowe, 2010; Sund, 2008), the purpose of ESD depends on one's philosophical and ideological standpoints as well as changes in perceptions of ESD over time, as already discussed. Vare and Scott (2007) categorise the standpoints into two main traditions: ESD 1 and ESD 2. ESD 1 shares similarities with first order quality (Pepper, 1926), in that it is static and builds on knowledge of how predetermined patterns are used in education. This approach has been summarised as "learning for sustainable development" and is associated with descriptions by Biesta (2013) of education as linking building blocks of

qualifications to each other in a specific order. In this view, basic knowledge provides foundations to construct more advanced understanding.

In ESD 2, educational quality is recognised as encouragement of students to develop a capacity for critical thinking and to test different sustainable development ideas, thus enhancing abilities and skills to empower individuals with an inner compass that guides them and confers the competence to act in an ever-changing world (Hargreaves & Shirley, 2009). A similarity to second order quality (Pepper, 1926) is the focus on human judgement of such quality in a specific context. This approach has been summarised as ‘learning as’ sustainable development (Vare & Scott, 2007). Knowledge is built by comparing different scenarios rather than introducing them sequentially. In the research this thesis is based upon, educational quality in the school organisation was assessed in terms based on ESD 1 and 2, called transmissive (ESD 1) and transformative (ESD 2) qualities. The intention of separating the two was to obtain new knowledge about how ESD can be effectively implemented in education.

A need to identify how education improve in general is understood in schools’ organisations is recognized not only in relation to ESD but also by some of the most experienced scholars in the school improvement research field (e.g. Hopkins et al., 2014; Harris & Chrispeels, 2006). In efforts to meet this need, attempts were made to identify what teachers and leaders in school organisations implementing ESD regard as crucial qualities. Thus, the quality concept was used to link what was sought in ESD (guiding principles of local school organisation that promote implementation of transformative ESD) to the ordinary work of schools’ organisational management and planning.

### ***Transmissive quality***

Transmissive qualities are any that contribute to the long-lasting and established realization of ESD within a school’s organisation, by securing recurrent attention of content knowledge of ESD to be discussed and included in education (Sterling, 2010a). Transmissive qualities give maintenance and stability to the organisation and provide security for teachers and students by giving them a feeling of what is right (and wrong) at the moment, since ESD includes a strong educational ideal of process and change (Holmberg et al., 2012; Reid, Nikel & Scott, 2006). Transmissive expressions of quality make the ESD perspective clear to decision-makers, politicians and the general public (Reinar, 2016) as well as colleagues, leaders and parents in such a way that ESD becomes accepted as a non-negotiable part of education. Examples of transmissive qualities in education include:

- Students’ work towards educational goals that ensures attainment of a minimum standard of content knowledge.
- Organisation of education based on the teacher’s knowledge base of curricular content.

- Development of routines that in the short term ease pedagogical staff's time burdens and protect them from adjustments to changes and trends in society.
- Routines that save time for the pedagogical staff, allowing them to spend more time with the students.

Nike and Lowe (2010) have argued that the stability and anchoring character of transmissive qualities in education promote persistence of an ESD realization in a school's organisation. On the other hand, as societal demands rapidly change, there is a risk of anchoring old structures and routines into education and a school's organisation, thereby inhibiting educational changes and renewal required in society (Peters and Wals, 2016).

### ***Transformative quality***

Transformative qualities in the school organisation are key contributors to an education intended to support and empower engagement in real and relevant social problems (Barrineau, et al., 2019; Jickling & Wals, 2012).

Transformative qualities in education modify beliefs and assumptions regarding the knowledge students need to participate in building a sustainable society. For example, knowledge of how to take informed decisions towards a sustainable society from a transformative quality perspective builds on a broad understanding of various values and interpretations of the world and how others are affected by decisions we make (Mezirow, 2009). Transformative quality is visible in education when the learner in a reflexive relation to the local and global surroundings can use and judge knowledge to identify alternative solutions. With such an informed understanding, learners can take informed and sustainable decisions and be aware of the consequences for themselves and others. In that way, (young) individuals can become actors in society towards a sustainable future while still in educational school institutions. Processes and changes within schools and school organisations that enable these learning conditions for students have been regarded as highly important in research related to ESD (Lotz-Sisitka et al., 2015; Vare & Scott, 2007). Manifestations of transformative quality in education include, for example:

- focusing on the learning process of students, rather than the central content of a specific subject;
- building on the learners' interest and experience of what is important and needs to be learnt in relation to a societal problem or challenge;
- engaging students in interdisciplinary work, involving a number of subjects and thematic work in education to raise knowledge making meaning to students; and
- implementing processes intended to change present settings, anchors and routines of education and to introduce new knowledge and learning.

A risk of schools emphasizing the transformative quality in organizing education relates to a tendency to fail in their intentions, resulting in short-lived changes rather than realisation of the higher ambitions and intentions. Often these schools are dependent on single individuals for their commitment to ESD, so-called 'driving souls' (Varga & Kuehr, 2007; Wickenberg, 2013). Giles and Hargreaves (2006) point to a lack of political and mandatory support as well as networks of like-minded people as possible reasons for failure to realize long-term intentions, such as education for a sustainable future.

### ***The transformative ESD - a perspective***

According to Hopkins (2013), the purpose of ESD, from a transformative perspective is to ensure that students are educated in a way that enables them to act for a sustainable future (Hopkins, 2013). For example, the education should develop students' competences to deal with a critical perspective in education to nurture a pluralism so they understand that more than one solution to a problem or future orientation is possible. Conflicts of interest often arise when ecological, social and economic development is set in a global or intergenerational perspective (Lundegård & Wickman, 2007). For example, certification that crops are sustainable and meet certain production standards may enhance their quality, safety for the consumer, and sustainability in some countries, or parts of countries, and provide lucrative compensation for the producers. However, for other producers the certification may be unattainable due to its high price or other constraints (economic, cultural or political or practical), thereby segregating the possibilities of production between (for example) large- and small-scale farmers. The smaller producers may have severe problems in finding such markets and be forced to sell at lower prices, thus impairing economic prospects for families and societies in various parts of the world. Transformative education is intended to empower students in democratic actions through participation in social development. Regional studies have shown that the pluralistic perspective in education and student inclusion seems important to most ESD implementers (Rieckmann, 2012). Issues that is actual to youth can in a pluralistic way become the starting point of new knowledge and management towards a sustainable society. The Swedish agency for youth and civil society (2019), for example, mentions areas of concern to young individuals as healthy lifestyles, mental illness amongst young people, individualized information flow through social media and democracy. As stated by Hopkins: "The highest educated people in the world make the most damage to the world, something must be wrong with our educational system" (personal communication at the Learning Teachers Network, 5th annual conference, Vienna, 25-27, September 2008). This can be said to explain the need for an education that is responsive to sustainability issues in society. The transformative perspective is important for counteracting old, cemented-in ideas and patterns in education, as discussed by Breiting et al. (2005) and Bourn (2008). New foundations of school organisation are needed to promote an understanding of what subjects, individuals and tasks that could gain from being connected rather than separated. Issues that are

pertinent to youth can become, in a pluralistic way, the starting point of new knowledge and management towards a sustainable society.

Trans is a Latin prefix meaning 'move' or 'exceed'. In the term transformative ESD, it refers to extension of educational backgrounds and value systems in both practice and searches for more inclusive and bridging concepts in empirical research (Kronlid & Lotz-Sisitka, 2012; Nikel, 2007; Öhman & Öhman, 2012; Sund & Wickman, 2011). In the school organisation, where education is planned, managed and facilitated, corresponding ambition to embrace and problems relevant to society outside school may require a holistic interdisciplinary approach to teaching, in which the school leadership, teachers and students participate in planning and managing education. This approach contrasts sharply with organisation of education based on disciplines or structures that separate taught individuals and subjects. One example how it could be enacted is a school organisation that plan for connecting the sustainability content knowledge with affective expressions stemming from the world outside school, such as action, passion and meaning to the learner (Pigozzi, 2007; Sterling, 2004a, b, 2010a, b; Sund, 2008; Öhman & Öhman, 2012). The following assumptions are identified in a literature review by Boström et al. (2018) regarding organisational ways to facilitate implementation of transformative ESD:

- An appropriate theory, or practice, of collective learning is applied, together with the often individualistic approach adopted by schools.
- Diversity in knowledge systems is generally considered a strength. Planning for inclusiveness, partnership, participation and communicative rationality among staff is required to enable such diversity.
- Resilience (the ability to respond to new ways of thinking and acting) before transformation is a crucial organisational characteristic. In other words, the ability to evaluate different possibilities based on organisational conditions to harmonize with what is new before deciding the most appropriate way forward.
- Planning for an ongoing process of dialogue, reflection, and critical discussions amongst staff in the school organisation is crucial.

Mezirow is seen as an important founder of learning based on transformative education. He defined the expected change of education in a seminal paper as a process involving transforming frames of reference in education (Mezirow, 1997). The frames of school organisations where planning and management occur were investigated in the studies underlying this thesis. Principles that make education more holistic and responsive to the outer society in promoting transformative ESD were sought. It has been suggested that practical application of a transformative ESD perspective (involving student inclusion, local cooperation, and pluralistic, critical teaching approaches) can promote transformative quality in a school organisation (Boström et al., 2018; Lotz-Sisitka et al., 2015). Analysis of the support required for transformative ESD in the school organisation should be based, according to many scholars, on

practitioners' choices, engagement, and reshaping of educational practice (Breiting et al., 2005; Nikel & Lowe, 2010; Pigozzi, 2007). This approach was adopted in the studies this thesis is based upon.

To summarize, a transformative perspective of ESD in schools' organisation refers to management and planning of education that promotes close relations with sustainable issues in the surrounding society. It provides organisational structures that empower students to participate in dealing with those issues. In such 'tight framing' (Scott, 2015), a school's organisation has adapted to sustainability issues by adjusting its form and functions to meet requirements to transform education in relation to society's needs for sustainability. The school organisation itself is an actor in development of society in a tight framing of sustainability. In a loose framing, the school organisation takes sustainability seriously, but structural and instrumental barriers prevent deliberation in the way education is organised and improved. A shift from loose to tight framing may involve changes to the curriculum, management, leadership and governance throughout the whole organisation.

### **The school organisation**

School organisation refers to how schools arrange their resources of time, space, and personnel (Danielsson, 2007). It encompasses the day-to-day administration, routines, processes of staff development, school management, community cooperation and networking in a school (Mogensen & Schnack, 2010). In this thesis, the school organisation is defined as the human efforts and material equipment that collectively help or hinder student learning and thinking (Bolman & Deal, 1991).

The aim of a school organisation is to provide and coordinate good education and learning arenas for the students (Fullan, 2015). However, components of 'good education' and suitable arenas may shift in line with expected outcomes of education. Thus, the school organisation can be seen as a tool that can be designed to help efforts to reach expected goals in education (Selznick, 1996). Blossing (2016) highlighted the variation in school organisations and proposed that they are not only designed but also developed in relation to their context and place. Characteristic features of a school's organisation can, for example affect how students and teachers interact (Danielsson, 2007). Characteristic features of a school organisation are highly relevant here, as the aim of the studies underlying this thesis was to identify organisational principles that facilitate implementation of transformative ESD.

Organisational principles sought in the studies may consist of structures and routines needed to make the organisation manageable and understandable to those involved in different parts of the organisation (Scherp, 2013a), for example, setting themes to reach educational goals for the students. Structures and routines may also facilitate (or constrain) implementation of ESD, but research has provided vague indications of the structures and routines that are fruitful in this respect (Scott, 2013). The school organisation can also facilitate processes that are found to promote implementation of transformative ESD, for example by including networking as part of daily routines (Giles & Hargreaves, 2006), support for students'

collaborations with society (Wals, 2018), adjustable schedules and flexible working times for teachers (Jidesjö, 2014). The overall objective of the studies presented in the thesis was to identify organisational principles that support processes and change linked to transformative ESD.

Multiple educational perspectives are involved in the planning and management of a school organisation, for example cultural, structural, political and transformational (Boleman & Deal, 1991). Diverse kinds of principles and resources (e.g., linguistic conventions, actions, material things, and symbolic expressions) are needed to realise objectives associated with these perspectives (Riddersporre & Erlandsson, 2016). Some are institutionalised and seldom questioned by those working in the school organisation, for example (in a Swedish context) the principle that boys and girls should have the same educational opportunities, provided by the same organisations in the same places. Institutionalised principles of education in a school's organisation have been there for a long time and form foundations for management and action within the local school organisation. Any school has organisational features that are well known by professionals working in the school. Scherp and Scherp (2007) classify these features in four 'dimensions': *routines and structures*, *professional knowledge creation*, components building and realizing a *holistic idea* for the school organisation, and *pedagogical practice*, which collectively set the parameters for running and managing a school organisation (Bolman & Deal, 1991).

The introduction of new perspectives or initiatives in education, such as ESD, oblige a school to introduce new principles in planning and management, or at least substantially adjust current features of these organisational dimensions to support the new perspectives. Otherwise there is a risk that they will hinder efforts to achieve the learning goals for students and teachers associated with the new perspectives (Fullan & Stiegelbauer, 1991). For example, it is hard to foster the learning goal of democracy in education without principles that provide arenas where students participate in democratic actions.

### **Theoretical foundation in school improvement research**

In this thesis and the underlying studies, school improvement research was applied to identify organisational principles facilitating implementation of transformative ESD. Placing the study within a school improvement theoretical framework was inspired by the work of Scheerens and Demuse (2005) and Creemers and Reezigt (1997) as well as Nikel and Lowe (2010), dealing with transformation of education and organisational change generally, and more specifically how it underpins fruitful ESD implementation. A review on school improvement by Harris and Chrispeels (2006) has also been used to understand how ESD implementation can be studied using school improvement research.

## **School improvement research**

School improvement research developed around the start of the 1990s to support criticism that schools were judged one-dimensionally (through student outcomes) and advocate another approach that could identify school leader- and teacher- processes that improve students' learning situations. School improvement projects were launched to discover how schools could become more effective through specific and context-related organisational principles (Creemers & Reezigt, 1997). They concluded that the context was more important than previously expected for schools aiming to improve student achievement and thus create a better future for their students (Creemers & Reezigt, 1997).

Links between supporting and facilitating principles identified in schools' organisations are often foci of school improvement research, in the belief that the whole is more than the sum of the parts, or as argued by Von Bertalanffy (2003), the whole takes a form that cannot be recognized from its parts. Indications of how schools can improve are sought in analyses of how existing school organisation principles reinforce or oppose each other. Good examples and role model schools are often used in reports on school improvement initiatives. Examples of improvement research include national comparisons of educational quality in relation to ESD. Other reported results are based on case studies of individual schools (Laurie et al., 2016), which have substantial advantages in school improvement research (Jarl, Andersson & Blossing, 2017). For example, comparisons of schools of varying standards have provided important information about how schools operate.

However, principles in one school organisation might be much less important in another school organisation, although many aspects are generalizable (Jarl, et al., 2017). Each school is unique, although school organisations can obtain testable insights into what might be important general structures and processes for specific educational purposes by studying other schools (Hargreaves, 2008).

The direction of educational change examined in school improvement research (e.g., students becoming sustainability actors or introduction of education based on students' own experiences) is formulated in advance, but the process involved in a change in education is the focal concern (Creemer & Reezigt, 1997). The core objective of school improvement research is often to identify the principles and presumptions that support the process and attainment of educational goals. It is generally conducted in practice through innovation and action (Fullan, 2007). The action challenges existing structures in education, and the improvement criterion is 'what works', as determined by evaluative data (which orients subsequent action). Thus, key objectives of school improvement research are to explore 'what works' and identify corresponding interventions. In data collection, discussion with the students, investigations of students' scheduling, and their opinions regarding the quality of teaching in the classroom are examples of how interventions in education are investigated. Identified principles of 'what works' enable practitioners to pinpoint optimal school improvement actions (Scheerens and Demuse, 2005). The wider aim of the thesis and underlying studies is to

increase understanding of guiding principles that can be readily adopted by school organisations to facilitate ESD implementation schemes and programmes.

The approach of transforming education by knowledge derived in school improvement research (theories concerning school organisation, practical application, school leader strategies etc.) is thus thought to be progressive, systemic (in that the whole school organisation is studied rather than individual parts of it), and self-regulating (Scheerens & Demuse, 2005). A school organisation that is functional in what Von Bertalanffy (2003) calls a systemic way would see “reform, not as a collection of changes but as an orientation towards a central theme that should serve as both the source and the target of all of the reform’s components” (Shaked & Schekter, 2013, pp. 781). The process of acquiring new learnings, through evaluations and systemic, whole school thinking, which changes and develops an organisation as a whole, leading to more learnings, is defined as self-regulation and self-organisation (Maturana, 1980).

School improvement research has also attracted criticism. Uncertainties regarding the final goal(s), amounts of time and resources invested by the schools, and how self-regulation within the school organisation is conducted, must all be considered (Kyriakides & Campbell, 2004). These uncertainties, and observations that the process is not linear, have been foundations of critiques of school improvement initiatives. For example, according to Forssten Seiser (2017), developing schools through teachers’ and school leaders’ attempting to improve their practices is time-consuming, although critical examination of education is a way to empower the professionals themselves to improve schools.

The reason for introducing school improvement research in an ESD study is that new solutions to societal problems require new knowledge. Education is often found to reproduce society rather than develop it. ESD challenges this paradigm and an aim of transformative ESD is to continuously change education (Jucker, 2011). School improvement research is thus helpful in finding new guiding principles that are found to be important in a school’s organisation. It addresses how education could be organised in reflexive relation to material and time, thus challenging set structures and routines. The aim of school improvement processes is to change a school’s internal processes systematically, in steps based on new evaluative learnings from practice (Harris, 2013). School improvement refers to all actions that collectively enhance students’ possibilities for learning in relation to a complex surrounding world. Thus, focusing on students’ learning is a core feature of a school improvement process (Harris, Day, Hopkins, Hadfield, Hargreaves and Chapman, 2013). For these reasons, school improvement can improve knowledge of fruitful implementation of transformative ESD, and stimulate associated changes in educational planning and management processes (Lotz-Sitska et al., 2015).

To sum up, school improvement research focuses on subjects (individual learners or specific organisations) in their contexts and tries to measure and understand how meaningful or relevant organisational principles

are to that specific learner or organisational ideal (Reezigt & Creemers, 2005). The outcome of an improvement initiative is often measured by schools or teachers in terms of how changes in the principles in the school organisation have promoted desirable educational goals (Reezigt & Creemers, 2005). The key findings in school improvement research are context-dependent (Leithwood, Jantzi & Steinbach, 1995). Thus, in the studies the context of interviewed school leaders was sought. Their individual context-dependent facilitation of implementation of transformative ESD were assessed and are discussed in this thesis.

### ***School improvement framework***

As already mentioned, another important part of the theoretical and empirical framework of the studies underlying this thesis was the school organisation model developed by Scherp and Scherp (2007). It has been widely used in Sweden and provided data that has been used to validate results. The possibility to compare the Scherp model derived from school improvement research and the WSA ESD conception was another important reason for choosing the model. The Scherp school organisation model distinguishes four dimensions of a school organisation: routines and structures, professional knowledge creation, components building and realizing a holistic idea for the school organisation, and pedagogical practice (through which students and teachers develop new knowledge together). The model facilitates identification of principles in separate dimensions of the school organisation that harmonize with the holistic approach to investigate and understand how implementation of an ESD perspective is facilitated by a WSA. According to the Scherp model, quality in a school's organisation is defined by the degree to which actors in the school (school leaders, teachers and students) are motivated by a holistic idea, embracing the organisational routines and structures, professional knowledge creation and practical pedagogic work (Scherp, 2013a). The Scherp model reflects an understanding of education similar to that of Marton, Dahlgren, Svensson, and Säljö (1999), who suggest that education should equip learners with the ability to reflect on what is relevant knowledge. Similarly, Biesta (2013) and Jickling and Wals (2012) argue that education is not only a matter of receiving professional knowledge of known practices but should provide learners with a sense of responsibility and freedom to actively change future society. Thus, the Scherp model has been developed to clearly distinguish what progress in educational practice actually means in organising education. The model was used to explore guiding principles of schools' organisation that promote transformative ESD in the research underlying this thesis, as described in more detail in the method section.

### **WSA ESD conceptions**

WSA ESD can be considered a conception of educational change, which is advocated in this section. It has emerged within the ESD research field, and is frequently used to judge the outcome and quality of ESD implementation efforts, and as a basis for discussing and presenting ESD research. WSA

addresses components in education that are known to support implementation of transformative ESD in a way that affects the whole school's organisation.

Initially, the conception of WSA ESD was developed for higher education research. For example, Stables and Scott (2002) and Sterling (2004a,b; 2010a,b) proposed that school organisations are systems that must be 'in tune' before education-driven change can occur. They were concerned with ways to secure environmental education that enables higher education students to take informed decisions about societal development issues including consideration of ecological sustainability. In recent years, the WSA ESD concepts have been introduced in research about formal education at all levels, including primary and secondary, notably through the textbook *Schooling for sustainable development in Europe* (Jucker & Mathar, 2016). The following paragraphs provide a historical review of WSA ESD, a current overview of its purpose as outlined in ESD research, its characteristic features and the definition of WSA ESD applied in this thesis.

The term WSA was previously used in research about schools' ability to incorporate perspectives of mental health, wellbeing and anti-bullying (Wyn, Cahill, Holdsworth, Rowling & Carson, 2000). The concept included involvement of all parts of schools and expert stakeholders in society in specific fields of education (Henderson & Tilbury, 2004), to expose students to relevant developments in the wider society while they were still in full-time education (Mogensen & Schnack, 2010). It has been applied, for example, to efforts to find solutions to sustainability issues in local societies by linking education to actors engaged in local environmental development (Wals, Geerling-Eijff, Hubeek, van der Kroon & Vader, 2008). Initially, WSA was not based in specific values but rather was a concept describing how education could be organized with the intention of supporting a local sustainable future (Summer & Childs, 2007). A similar term, Whole Institutional Approach, was introduced by policy-makers seeking to engage educational and other stakeholders holistically in formation of a sustainable future (UNECE, 2014; UNESCO, 2014c). This was adopted by higher education institutions to assist society in various ways, as discussed, for example, by Wyness, Warwick & Sterling (2015).

In primary and secondary education settings, the term Whole School Approach is more common and therefore used here. In summary, WSA was originally developed to create shorter links and more extensive cooperation between educational institutions (schools, universities) and local societies, attempting to create opportunities to learn from each other and affect each other's agendas. In this thesis the interest is mainly directed at the changes it introduces in educational organisations, i.e. schools.

McKeown and Hopkins (2007) identified WSA as grounds for assessing educational performance. They treat WSA as a school system that incorporates ESD in a way that embraces interdisciplinarity approaches and all groups involved in education, students, teachers and school leaders. Shallcross (2005) also recognizes the importance of links within a school organisation, between subjects and individuals, to enhance teaching and new knowledge formation in education. Thus, he recommends more detailed application and

scrutiny of whole-school approaches in efforts to identify optimal organisational support functions and requirements for ESD.

Hargreaves (2008) reports on failures to implement ESD successfully in schools, and argues that they could be due to seeing implementation of ESD as a political project, without engagement of the whole school system, as the WSA conception suggest by authors mentioned above. Without such implementation, the internal facilitating organisation that makes ESD holistic, with all parts of the organisation communicating and interacting, is not secured. Mathar (2013) sees WSA as a tool to transform education in a direction where the school itself becomes sustainable as an institution in that its education becomes relevant to, and usable by, the local society through teachers' and students' interactions with society stakeholders. Thus, part of the ESD research has shifted from viewing WSA mainly as a close relations between schools and society, to a contributor of quality in education. WSA is than seen as a driver of new knowledge enhancing to solve complex situations in society, with the students actively engaged, mainly locally but in some cases globally.

Characteristic organisational features of an WSA ESD conception reportedly include *policy* and *transparency*, referring to strong sharing and understanding of the purpose of educational practices in the whole school organisation: students, staff, parents and the community (Sterling, 2004a). Students, for example, should have opportunities to learn through practice about societal needs, and contribute to practice-based improvements (Hargreaves, 2008).

Another suggested characteristic feature is *continuing professional development*, which refers to the potential of ESD to profoundly change education over time, and the associated need for training. These features are also important parts of education generally, but they are specifically highlighted as requirements for implementing ESD (Gough, 2005; Hargreaves, 2008; Henderson & Tilbury, 2004). School organisations that are managing and planning education, in a manner viewed as whole school approaches, are further proposed to enhance capacities to face “real world problems” (Shaked & Schekter, 2013, pp. 778) through engagement “with communities to become active agents of change rather than passive transmitters of information of values” (Shallcross, 2005).

Another characteristic feature of the WSA concept is the *relevance* of the education to the wider society. In succeeding to understand educational relevance, schools are encouraged to see themselves as “social institution[s] in relation to other institutions and agencies within society” (Elliot, 1999, pp. 338). While WSA ESD policy (UNESCO, 2014c) is mainly expected to act as a driver towards a sustainable society, the examples mentioned above illustrate what it constitutes in theory in relation to education. WSA is a term that is also used in various educational settings. For example, Hui (2002) has discussed the difference between a fostering or guiding WSA, meaning intended change can be interpreted in different ways by applying a WSA. Mathar (2013) summarises the ideal WSA ESD to entail and foster all of the above mentioned characteristics in organising education — *policy transparency, continuous*

*professional development, participation, action and progression of education, and educational relevance to the wider society* — as a new concept of education for the future. According to Hargreaves (2008), hallmarks of ESD are a guiding WSA, built on active engagement of the entire school (including students, educators and administrators) in issues that support ESD in a holistic manner and full integration of the issues in the curriculum. In ESD research both the fostering and guiding perspective of WSA is emphasised.

The WSA ESD conceptions is advocated, and was applied in this thesis, and underlying studies, because they provide both a systemic way to study the internal components in a school's organisation that support ESD, and an educational conception through which education can be changed to increase its relevance to the development of society. The holistic ideal of closely and directly associating schools' internal organisational features and educational practices with outcomes in society is not emphasised in other frameworks of educational change. For example, effective school development and school improvement frameworks focus mainly on roles of intrinsic features of schools' organisation in changing education. Moreover, the roles of school leadership and school organisation in relation to WSA ESD have received little research attention. This thesis addresses that gap.

### **Bridging school improvement research to conceptions of WSA ESD**

This section compares, and notes both similarities and differences between, theories on school improvement research and theoretical conceptions of WSA ESD. The reason for introducing and comparing alternative theoretical backgrounds to ESD is to find a suitable framework for understanding school organisations' influence on implementation of transformative ESD. School improvement research is aligned with assertions rooted in theory of action (Argyris, 2000), that educational change can only be understood when outcomes and practical applications of a theoretical framework are studied. As argued here, parallel application of the two theoretical bases enable complementary analysis and synergistic understanding.

The first comparison concerns how new perspectives in the two theories match already established cultures in a school's organisation. Where is the transformation initially taking place? The WSA ESD conception includes characteristic concepts: participation, action, progression, a coherent school organisation and educational content relevant to the creation of sustainable futures for society. These features may or may not be present in the school organisation. Evaluative research in, for example, the ENSI network has concluded that they promote successful ESD implementation, so they must be fostered and maintained when attempting to implement transformative WSA ESD (Wals, 2018). The school improvement theory, including the framework model by Scherp (Scherp & Scherp, 2007), is oriented towards analysis of the internal principles of schools' organisation in relation to each other to identify optimal ways to support quality-enhancing changes in education (Harris, 2013). Including the concepts of WSA ESD in a school improvement model enables analyses of components that are likely to enhance ESD implementation. It can be said that these components are introduced from an

external perspective and matched against quality, values and school culture already established in the internal school organisation.

The second comparison between the conception of WSA ESD and school improvement theories concerns actions and practices to promote desirable outcomes for students. How can we know that the transformation taking place benefits students' knowledge and learnings in ESD? The outcome of student knowledge is not measured by asking students in either the school improvement framework used in this study or WSA conception suggested. Instead, the aim is to identify actions or functions in the school organisation that contribute to what the learner or school organiser define as high quality education. WSA ESD is oriented towards a sustainable society (Shallcross, 2005). The WSA ESD conception in this study includes a holistic perspective of schools' organisation, as in school improvement research (Scherp & Scherp, 2007). Here, therefore, the WSA ESD conception is matched to a school improvement model that can be used to measure quality in education. Requirements in a school's organisation for collaboration with society that raise quality of education can then be studied. Thus, the approach of linking a WSA ESD concept to school improvement theory is operationalised in this thesis. Measures of quality in the school organisation, and its implications for student knowledge and learnings are demonstrated in Paper 3.

## Framing the research questions

In this section, the process of structuring the research is described. Figure 1 illustrates the iterative process of posing and addressing questions, and the application of concepts outlined in the background section of this thesis in the process. Results obtained in early stages of the research process were used to formulate new questions designed to broaden the knowledge about requirements for implementation of transformative ESD. This is illustrated by the wide base of the triangle in Figure 1.

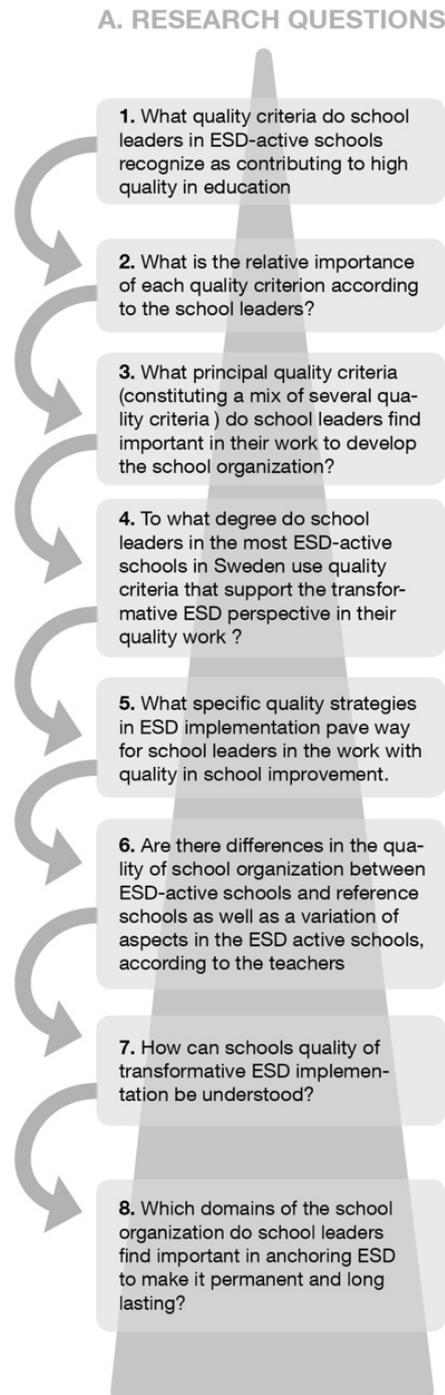
Guiding principles in the school organisation that help to embed a new educational perspective, such as ESD, are not always obvious to those responsible for planning and running a school (Fullan, 2001; Scott & Gough, 2010). The first three questions posed in the research concern the quality criteria that school leaders regard as important to raise quality in their school organisations. The relative importance and focus of quality criteria in developing the school organisation initiated the search for guiding principles in the study (see Figure 1, questions 1-3). The studies focused on normative aspects of ESD implementation (the transformative ESD perspective). This aspect was especially important throughout the research work and research questions focused on the presence of specific transformative elements in the school organisation (Figure 1, question 4).

The theoretical framework found in school improvement research and conceptions of WSA ESD outlined above were used to seek beneficial organisational guiding principles for a transformative ESD. Empirically, this was done using measures of educational quality that are widely applied in school improvement research (Berg & Scherp, 2003; Harris & Chrispeels, 2006). Questions on quality strategies by school leaders and perceived quality in school improvement by teachers were posed and addressed (Figure 1, questions 5 and 6). This attempt to probe schools' experience of implementing ESD was facilitated by drawing together concepts from the two research fields (school improvement and ESD) and applying their common terminology (particularly *quality*, *transformative*, and *holistic/whole school organisation*).

Implementation of transformative ESD can be studied and separated from more structural and transmissive ESD implementation, using tools applied in school improvement research (Scherp & Scherp, 2007). Differences in assumptions regarding quality in education cannot be effectively understood by dividing persons or schools into different groups; quality assumptions are considered to be interlinked within individuals and school organisations (Bass & Steidlmeier, 1999). There may be differences in relative strengths of the assumptions in a particular school organisation (Nikel & Lowe, 2010; Marks & Printy, 2003). Thus, the strengths of such assumptions using data from both school leaders and teachers were investigated. In combination, the data show how assumptions of quality can be interpreted in the local school organisation (Figure 1, question 7).

The last question addressed in the research deals with the quality assumptions in the school organisation that can provide structure and educational routines that anchor ESD (Figure 1, question 8). This question was

based on findings regarding the importance of transmissive qualities in organisations of ESD active schools, which was identified when addressing research questions 1-4 (Figure 1).



*Figure 1. Schematic illustration of the framing of the research (iterative process of formulating and addressing questions) underlying the thesis.*

## **Aim and research question**

The aim of this thesis (and the studies it is based upon) is to deepen the knowledge of the role of the school organisation in ESD implementation. Major objectives were to identify guiding principles in the school organisation that promote or hinder ESD's embedment, and thus strengthen transformative ESD. This means education that is responsive to the surrounding society where continual processes of change in education are emphasized and planned for in the management of a school. The overall research question guiding the studies was:

*What guiding principles in the school organisation promote implementation of transformative ESD?*

## Methodology

This section describes the methods applied in the studies in four parts. First, the selections of schools and interviewees (school leaders) and survey respondents (teachers) are described. Second, the quality criteria (QC) used to estimate strengths of organisational guiding principles for an implementation of transformative ESD are explained. Third, the research design, which included a combination of qualitative and quantitative methods, is delineated. Finally, approaches used to assess the validity and reliability of the research are discussed.

The analysis of leaders' and teachers' perceptions of *quality* in highly ESD-active schools enabled identification of organisational guiding principles that apparently promote transformative ESD. Briefly, as detailed in the following sections, their understanding of (and assumptions about) high quality in schools' organisation, including how it is established and maintained, were linked to theory regarding quality in ESD implementation. This provided rich material for drawing conclusions and identifying possible guiding principles for successful implementation of transformative ESD.

### Selection of schools

Swedish upper secondary schools actively implementing an ESD perspective were selected to study links between implementation of transformative ESD and quality in schools' organisation. Two sets of such schools were selected, to cover variation in school organisation. The two groups were distinguished according to theoretical and practical assumptions associated with definitions of the ESD concept according to two (transmissive and transformative) educational perspectives. Based on the discussion of ESD 1 and ESD 2 in the background section, it is recognized that there are multiple reasons for implementing ESD. To ensure that this diversity was reflected in the schools participating in the study a first group based on ESD awards was supplemented with another group that shared interest in interdisciplinary studies without any official certification. In total, there were 10 responding schools in the two groups.

The first selection group was drawn from national registers of schools committed to ESD. More specifically, they list schools that have applied for and been awarded one of two Eco labels for adopting an ESD perspective: *Grön Flagg* [Green Flag] administered by the organisation Keep Sweden Clean (2014), and *Skola för hållbar utveckling* [Schools for sustainable development], administered by the Swedish Agency for Education (2015). *The Global School's* register of schools participating in professional development related to ESD for teachers and school leaders was also used. The Global School is administered by the Swedish Council for Higher Education (2014) and runs local development and implementation programmes on ESD in conjunction with Swedish municipals and regions. The three registers are the most extensive available sources of data on Swedish schools that are actively adopting an ESD perspective.

A list of schools included in more than one register was compiled and evaluated on the basis of the following parameters:

- Inferred duration of the school's activities and commitment in relation to the ESD perspective;
- Available documentation relating to the ESD perspective on the school's website;
- Number of recipients of newsletters focusing on ESD per school;
- Number of persons participating in conferences and further training in relation to the size of the school.

The degree of active ESD implementation in each school in the list was estimated using an indicator based on pooled values of the four variables.

To validate the estimates of ESD activity at the chosen schools, their presence in smaller available registers, such as the WWF's list of model schools and Swedish Society for Nature Conservation's register of school projects, was checked. Following the evaluation of the schools' activity, they had the opportunity to estimate their own ESD-efforts through self-appraisal, particularly the participation of the school management and school leader in ESD implementation. Local actors in the form of individual organisations and resource persons in the programme *The Global School* confirmed that the selected schools worked actively in accordance with an ESD perspective. The information collected in the selection process clearly identified the schools most actively implementing the ESD perspective among upper secondary schools in Sweden. Seven of these schools were invited to participate in the study, and they all accepted.

The second selected group comprised schools in a network exchanging experiences of interdisciplinary collaboration. The network is an informal offspring of a national research project, Albatross, that was initiated in 1996. Representatives of schools that joined the network got to know each other in the national research project, which has been completed. The aim of the national project was to support pedagogic and didactic school improvement. The network was initiated and led by the regional school board (Svenska kommunalförbundet) and two school national teacher unions (Läraryrket [Swedish Teachers' Union] and Lärarnas Riksförbund [The National Union of Teachers in Sweden]). School projects were launched and summarized in 1999.

A holistic and interdisciplinary approach to learning is a characteristic feature of a transformative perspective of ESD and practice-related implementation strategies (Breiting et al., 2005). Schools that explicitly applied an interdisciplinary approach to ESD were selected. The schools themselves and local actors administrating the network confirmed the schools' active ESD implementation efforts. Three such schools were invited to participate in the studies and they all accepted.

In total 10 schools were selected (seven using the registers and three from the interdisciplinary networks). It transpired that two of the seven schools selected in the first process were also members of the interdisciplinary

network. This is not regarded as problematic, since both schools were committed to ESD implementation.

### **Selection of respondents**

Berg and Scherp (2003) argue that school leaders have a more advanced understanding of their schools' organisation than, for example, teachers due to their duty to both steer and lead them. School leaders mediate explicit steering demands from curricula, school law and school reforms, local school governors and the political school board (Berg & Scherp, 2003). Moreover, the school leader's approach to management has been shown to have profound effects on ESD quality in school organisations (Hargreaves & Fink, 2009). The idea of using school leaders' understandings and thoughts on practice to formulate and address new research questions has been suggested in the ESD research field (Breiting et al., 2005; Mogensen & Schnack, 2010). This will, *inter alia*, provide more context-related information (a limitation in quantitative, e.g. survey-based research).

School leaders were selected for interviews by asking each of the 10 schools to nominate the leader assumed to have the most insights into their implementation of the ESD perspective, mainly based on the number of years s/he had worked as a leader at the school. The intention was to ensure that each school was represented by a leader with at least five years of service in that position, so that s/he could give a first-hand account of the ESD implementation over time. In cases where the current school leader had fewer years of service, the previous school leader was also invited to participate. Four out of ten schools were therefore represented by two school leaders, and 14 school leaders participated in the study in total.

Teachers from eight of the ESD-active schools that participated in this study were selected as respondents for the conducted survey. They were all members of the teams of teachers most actively engaged with ESD at the selected schools, according to their school leaders. In total, 263 teachers participated: 58 from the eight ESD-active schools (8-20 per school) and 205 from the 12 reference schools. All the schools included in the study had teacher teams organised around students (a common arrangement in Sweden). Thus, the participating teachers were closely connected to the daily school work and taught diverse subjects, such as Swedish, social sciences, foreign languages, mathematics and science.

### **Analysing unit**

My studies, and this thesis, were intended to bridge the gap between the ESD and school improvement research fields. Therefore, empirical indicators that could be understood and are relevant within both research fields were used. The concept of quality is used as a mediator between these fields (Laurie et al., 2016), so QC were used for this purpose. QC can be used to find patterns in variables, and interactions within a system (Breiting et al., 2005; Scherp & Scherp, 2007) that are relevant to a specific group (e.g., teachers or school leaders) perceived to be educationally important (Reid, Nikel & Scott, 2006).

Examples include attributes that facilitate the long-term persistence of a vision, and/or enhance student inclusion. Clusters of QC can reveal characteristic functions and processes in education that are difficult to identify using single indicators. QC can be seen as established analytical tools in research on ESD and school organisations.

An iterative approach, involving both inductive and deductive steps, was applied in a conscious process to analyse the acquired data. In such an approach, new research questions are gradually formulated on the basis of results. The process is illustrated in Figure 2 as two triangles, which represent research questions guiding the process (Triangle A) and the methods applied (Triangle B). The iterative process was initiated (see top of Triangle A), with a question: What QC do the school leaders consider to reflect high quality in the school organisation? The methods applied to address it are shown in the corresponding position in Triangle B corresponds with the research question from Figure 2 A, in this case semi-structured interviews, during which conceptual maps were produced to document the school leaders' understanding of their school organisation (see top of Triangle B). As illustrated in the figure, the broad base of research questions and the chosen methodology lead to an iterative process aiming to reach a more deepen understanding of the overriding research question (*what guiding principles in the school organisation promote implementation of transformative ESD?*)

The triangles in Figure 2 represent the main line of argument in the thesis. The research questions in Triangle A relate to the methods and tools chosen to address them in Triangle B. As illustrated by the broad base of Triangle A, when research questions have been asked in an iterative process, they collectively form a broad foundation for understanding the characteristic organisational guiding principles of a school that promote (or hinder) implementation of transformative ESD. Similarly, the wide base of Triangle B indicates that the methods used in the studies contribute to a broader understanding of the schools' characteristic features. Thus, the iterative approach in which the questions were formulated and methods chosen provides solid foundations for research conclusions (Raven, 2006).

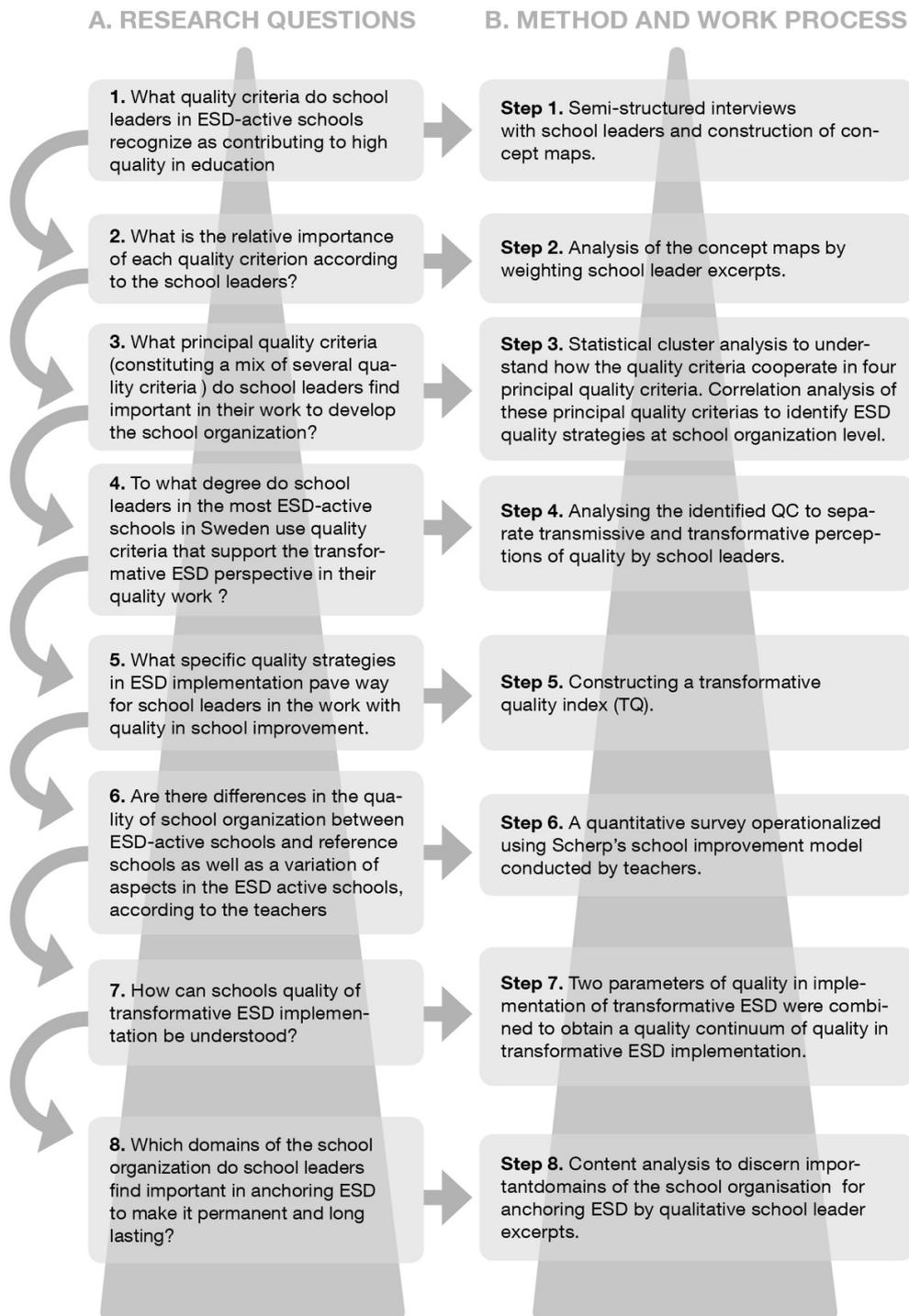


Figure 2. Illustration of the iterative research approach, the research questions in triangle A were addressed using methods and procedures at corresponding positions in triangle B, successively refining understanding of guiding principles in the school organisation that promote or hinder implementation of transformative ESD.

## **Mixed methods**

The research design applied in the studies underlying this thesis was based on a mixed methods approach, including qualitative methods involving semi-structured interviews with school leaders, and quantitative methods applied to analyse conceptual maps generated by the school leaders and teachers' responses to a questionnaire.

This approach provides a way to combine stories of individuals, e.g. school leaders and teachers, with measurements of phenomena of interest in the data (Chalmers, 2013). Stories can be observed in real situations, where research data are gathered. The open ended question used in this work "How do you maintain high quality in your school organisation" exemplifies how data on individuals' stories were collected. Qualitative data elicited by such questions were analysed to identify the kinds of qualities that organisations of the included schools focused on.

Moscovici (2001) argue that identification of anomalies by qualitative research methods can catalyse development of new knowledge. However, there is a high risk of qualitative research becoming merely descriptive (answering *what* questions) instead of explanatory (*why* questions) (Cohen, Manion & Morrison, 2000). When qualitative data are quantified, patterns and relationships emerge between the main factors, while deviations – anomalies – still remain. These factors can then be identified and studied rather than simply being described, enabling deeper understanding of the relations involved. In quantitative research, less prominent factors are difficult to identify in large datasets (Scherp, 2013b). Thus, a mixed method approach can provide richer and more nuanced information about a research problem than any single method (Creswell & Clark, 2017; Scherp, 2013b). Quantitative data are also important and helpful for reducing rich qualitative data material and increasing the generalizability of results (Creswell & Clark, 2017).

The following passages describe the methodological procedures applied in a pilot study, and then those applied in the studies reported in detail in the appended Papers (which are also illustrated in Figure 2).

### ***Pilot study***

In the pilot study, 40 school leaders attending a professional development event on sustainable development related to school organisation conducted semi-structured interviews with each other on the theme high quality in school organisations. They then produced conceptual maps (described in Paper 1 and exemplified in Figure 3). The maps were analysed by manually clustering prominent perspectives displayed in them. The analysis provided understanding of examples of QC that could be applied and addressed in the research.

In addition, two pilot interviews were conducted with individual school leaders to develop interview skills and produce conceptual maps. One interview was carried out with a person known to the interviewer and therefore easy to talk with. The second interview was with a person less well known to

the interviewer. The objectives of this preparatory data collection were to understand the school organisation in the context of the research and develop familiarity with the technique of recording via a mobile phone, the design of conceptual maps and interview techniques. The following sections sequentially describe each step in the main studies.

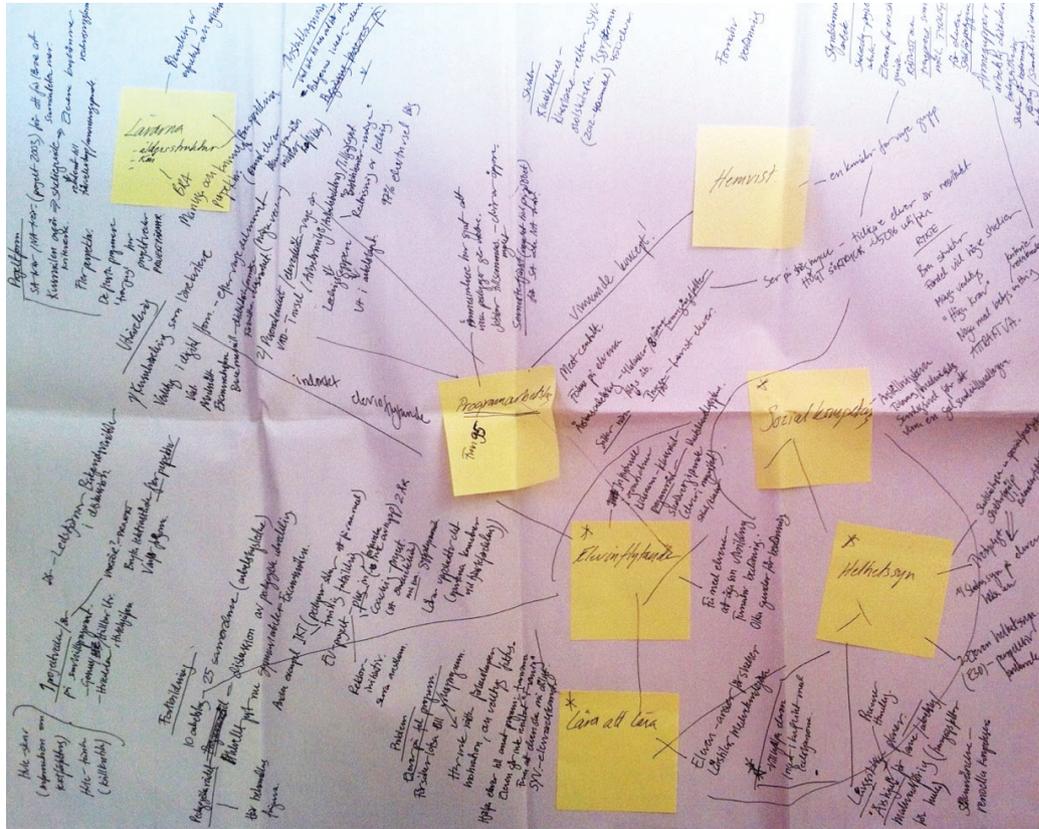


Figure 3. Example of a conceptual map created during a semi-structured interview.

### Step 1. Semi-structured interviews with school leaders and the production of conceptual maps

The holistic approach adopted in the studies is reflected in the choice of methods. A concept map is intended to show relations between things, ideas and people, providing a holistic way to approach phenomena (White & Gunstone, 1992). The focal phenomena here are qualities required in a school organisation to promote education. The conceptual maps created during interviews are understood as individuals' perceptions of quality. An inductive method was used to produce the conceptual maps. The first interview question posed to school leaders was: *How do you maintain high quality in your school organisation?* This was followed by further understanding-related questions, based on the school leaders' statements on quality. The conceptual maps visualize their understanding of their school organisation in relation to the concept of quality. The maps show the most prominent qualities expressed by school leaders, without ignoring less frequently mentioned quality assumptions. The data collection process was inductive in that qualities of

importance to the school leaders were continually added. Each interview lasted around two and a half hours.

Each interview was audio-recorded and transcribed, and the recordings were listened to carefully several times in efforts to ensure that vaguely or obscurely expressed expressions of quality were not missed.

To minimize errors in this stage of data collection the conceptual maps were edited and corrected immediately after the interviews in conjunction with the respondents, who could indicate mistakes based on misunderstandings. Each school leader had the opportunity to approve the conceptual map as representative of his/her organisation. The iterative method used here generated rich material of stated expressions regarding quality to analyse.

### ***Step 2. Analysis of conceptual maps through rating identified QC***

In Step 2 of the analytical process, qualitative data obtained from the conceptual maps and audio recordings of interviews were quantified. The QC identified in the conceptual maps were each attributed a rating (from 0 to 3) related to the relevance of the QC for the individual school leader. The criteria that the school leader regarded as fundamental and strongly advocated were rated as three. A mentioned quality criterion whose relevance was further stressed during follow-up questions was given a rating of two. QC only mentioned once or occasionally, and for which no convincing examples of relevance were given, were assigned a rating of one. The individual school leaders' ratings of each identified QC were summed to obtain measures of their collective views of the importance of specific QC in an organisation with an actively implemented ESD perspective.

A factor that could have affected the validity of my research in terms of identified quality expressions is that the school leaders might have described idealised concepts of quality related to their respective schools' vision statements, rather than qualities that were actually present. To counter this possibility, they were always asked to give examples of efforts made to address the organisational quality expressed. Nevertheless, the school leaders repeatedly asked, during the interviews, if they were supposed to describe the organisation as it was or the organisation they desired. Because of this difficulty in separating real and idealized statements about school organisation, careful attention was paid to this distinction in the analysis. The quality statements that were expressed as wishes or visions for the future were placed in a separate QC describing the school leaders' 'inner conviction, vision and philosophy'. This is one of 26 QC identified in the research.

### ***Step 3. Statistical analysis to understand connections between identified QC***

In Step 3, the quantified data generated in Step 2 were analysed using the *Statistical Package for the Social Sciences* (SPSS version 20). Hierarchical cluster analysis was applied to assess connections between different types of QC and group them in general categories.

Four *principal quality criteria* were identified, which can be said to constitute representations of areas that the school leaders used to enhance and maintain quality in their schools' organisation. These principal quality criteria were validated both statistically and in relation to my knowledge of the material and context of the data collection. Finally, Cronbach's test was applied to assess the reliability of the data collection instruments used (semi-structured interviews). Since the number of school leaders was small (n=14), Cronbach's alpha is a less robust indicator of reliability than if there had been more respondents. The measure was therefore used as a safety precaution as the principal quality criteria were identified qualitatively. Cronbach's  $\alpha$  values between 0.63 and 0.78 were obtained, indicating that the data had acceptable reliability. A value of 0.7 or higher is usually considered the threshold for acceptable reliability, but for studies with as few respondents as this, a value of 0.6 can be accepted (Field, 2013).

Next, the relationships among the identified principal quality criteria were explored by Pearson's correlation analysis to determine which of the principal quality criteria were used by school leaders in the ESD-active schools. The analysis indicated what principal quality criteria are likely to be used in combination by school leaders. The identified combinations of principal quality criteria were denoted *quality strategies*. Hence, the habit-forming patterns that might constitute more generalizable discoveries of school praxis were identified (Scherp, 2013b). Quality strategies are the means through which ESD school leaders attempt to create and maintain high quality in their organisations.

#### ***Step 4. Analysis of QC identified to distinguish between transmissive and transformative qualities***

As already described, QC related to implementation of ESD may be either transmissive (primarily qualities that strengthen existing structures in the organisation) or transformative qualities (development of new methods and examples in the organisation that contribute to learning in line with the surrounding world). Therefore, in Step 4, QC related to transmissive and transformative perspectives of ESD were identified to increase understanding of how school organisations implement ESD. For this, each QC identified in Step 2 was weighted on a scale from 0–10 on the basis of the degree of transmissive or transformative quality in the arguments by the school leaders. The scale is described in detail in Paper 2. As in Step 2, this resulted in quantification of qualitative data. In efforts to ensure validity, some of the material was reviewed externally, then co-assessments were discussed and compared with a third party to reach consensus on final assessments.

#### ***Step 5. Constructing a transformative quality (TQ) index***

In this step, an index was constructed to facilitate interpretations of results regarding QC specifically related to a transformative education perspective. The index was designed on the basis of the quantified values for each criterion. The weighting of each QC indicating its apparent importance for school leaders

generally was multiplied by its transformative quality weighting (as expressed by the school leaders). The multiplied value was related to an ideal state in which all QC mentioned by the school leaders would be transformative quality related. The index is expressed on a scale from 0–1 as an overall value of the degree of weighted transformative quality expressed by the leaders of ESD-active schools.

The index was constructed to ascertain if strongly transformative quality focused school organisations choose specific strategies for ESD implementation. By studying the QC highlighted and strategies adopted by schools with high and low indices, connections between answers to the *what* and *how* questions were sought. Thus, Step 5 demonstrated the benefits of the mixed method approach, particularly its ability to explain the connection between *what* a school focuses on (which principal quality criteria) and *how* (the quality strategies expressed by leaders with varying degrees of transformative manifestations in their school organisations).

### ***Step 6. Survey of teachers' perceptions of quality***

A quantitative survey designed to elicit teachers' perceptions of the quality of their school organisation was conducted with the teachers from eight of the ESD-active schools that also had participating school leaders in the research study. The objective was to understand how school organisations built on a variety of quality assumptions and improvement traditions managed to implement transformative ESD, from a teacher's perspective. The responses were also compared with responses of teachers working in a set of reference schools (not working with ESD-implementation), acquired during the same period of time with the same survey instrument. The items in the questionnaire used in the research were constructed to cover variables reflecting the teachers' perceived emphasis in their schools on the underlying logic and factors associated with three dimensions of a theoretical school improvement model (the Scherp model). The questionnaire is an operationalization of the model. The dimensions Holistic idea, Routine and structures and Professional knowledge creation, and the coherence of the dimensions, were measured. All items in the survey invite Likert-type responses on a 1–4 scale (1 = disagree, 2 = partly disagree, 3 = partly agree, 4 = totally agree) in which a high score indicates that the dimension is emphasized, or that two dimensions are coherent with each other.

Four comparative analyses based on the improvement parameters in the schools were conducted. In the first analysis, responses of all the teachers in the selected ESD-active schools were compared with those of all the teachers in the reference schools. In the second analysis, responses of teachers in the selected ESD-active schools that adopted different variants of an ESD implementation strategy (as previously distinguished in the selection of schools) were compared. In the third analysis, responses of teachers in the selected ESD-active schools that applied different quality strategies in their school improvement process (as distinguished in Step 3) were compared. In the fourth analysis, responses of teachers in schools with four combinations of ESD quality implementation strategies and general quality approaches that

could lead to distinct ESD-oriented school improvement processes were compared.

### ***Step 7. Continuum of transformative quality in ESD***

In this step, schools representing high and low degrees of transformative quality in ESD implementation were selected, using two parameters: the organisations' TQ-indices as identified by the school leaders (Step 5), and quality of school improvement as perceived by the teachers (Step 6). These indicators were used to construct a continuum of quality in transformative ESD, then the schools were placed along the continuum and clusters of schools with varying degrees of transformative quality in ESD implementation were identified. This procedure is explained in detail in Paper 4. Finally, two groups of three schools were selected to represent schools with the highest and lowest focus on transformative quality in ESD implementation.

### ***Step 8. Analysis of qualitative excerpts to find anchors of ESD***

The quantified data displayed in the continuum of schools generated in the preceding step were used to select schools for a comparison of how they anchor ESD in their organisation. Each QC with a high transmissive emphasis in the two selected school groups was viewed in this step as a potential anchor of ESD quality. The emphasised transmissive QC within each of the two selected groups of schools (with high and low focus on transformative quality in the school organisation) were selected for further analyses to identify domains of the school organisation that are important for anchoring ESD.

Thematic content analysis based on expressions of school leaders associated with the transmissive-weighted QC was applied, using categorisation of emergent themes (Fraenkel, Wallen, Hyun, 2011; Scherp, 2013b; Weber, 1990). Based on characteristic features of school leaders' expressions as they talked about transmissive-oriented QC, the data were coded in relation to each selected school group. Transcripts of interviews with the school leaders were used to associate the categories with organisational domains that they indicated were important for anchoring structures and routines. The results were then used to analyse how schools with high and low focus on transformative quality respectively anchor ESD in their organisations.

### **Validity, reliability and trustworthiness**

The presentation of the 8-step research process (see Triangle b in Figure 2) in section 5 describes and clarifies the validity and statistical reliability of the research in terms of preparation, sample selection, data collection, and analysis. The studies were conducted in a Swedish context where the informants used their mother tongue. All data management and analysis was performed before results were translated into English. Validity and reliability issues are also discussed in detail in the four papers, so they are not further addressed in this text. However, the overall trustworthiness, triangulation and possible limitations of the study are briefly discussed below.

Trustworthiness is an important element of the quality of

qualitative research. The research underlying this thesis was structured to meet Larsson's (2005) three criteria of research quality, as discussed below. He highlights three dimensions of research that should be considered when evaluating its trustworthiness or quality. One is personal experience bearing on the data to be interpreted, the second is the theory used to interpret acquired data and the third is the account of the research field concerned.

In efforts to ensure that the data collected in the studies presented in Papers 1, 2 and 4 had high quality, a pilot study was conducted to acquire familiarity with the concept mapping by practicing the techniques involved in both drawing the maps and audio taping. The validity of the construction and assessment of the concept maps was also evaluated by the interviewed school leaders themselves, and through discussion with other scholars. Throughout the research process the benefits and risks of practical familiarity with the ESD perspective from a more normative perspective were discussed with my supervisors in order to minimize risks of personal bias in the process, in accordance with Larsson's (2005) first criterion.

In line with Larsson's (2005) second quality criterion, theory was used to validate the data. More specifically, the study was rooted in school improvement theory to provide robust foundations for the studies of ESD in practice.

Regarding Larsson's third criterion, trustworthiness was raised by interpretive comparison of the results with previous findings. The data were interpreted using two theoretical frameworks, a school improvement framework (Scherp model) and previously identified QC related to ESD (Breiting, et al., 2005; Boeve-de Pauw & Van Petegem, 2011; Leo & Wickenberg, 2013a; Leo & Wickenberg, 2014). The validity of the teacher questionnaire survey has also been confirmed in previous studies in the same Swedish context (Scherp 2013a; Scherp & Scherp, 2007).

In addition, the research has been validated by triangulation. It involved a mixed methods approach, including data collection by several methods (interviews and questionnaire surveys) from several groups of informants (school leaders and teachers) at the same schools. The triangulation of the results from the interviews with school leaders (Papers 1 and 2) and teacher survey (Paper 3) further validate the results obtained in those studies. These results then provided firm foundations for the selection of schools for the analysis presented in Paper 4.

The trustworthiness and validity of the study could have been further enhanced by data collection activities that were prohibited by the geographical dispersion of schools, time limitations and dual roles of practitioner and researcher. Likewise, data on views of students in the respective schools could have provided further insights that validated and refined the data and understanding obtained from the school leaders' and teachers' accounts.

## **Ethics**

The whole study reported in this thesis was conducted according to the ethical guidelines of the Swedish Research Council (2017).

All respondents (school leaders and teachers) were informed that their participation in the study was voluntary. More specifically, teachers that were assigned by their school leaders to participate in the study were individually asked for consent before the questionnaire survey was distributed.

All participating informants were adults and no ethically sensitive questions were asked. All informants (school leaders and teachers) were informed that they could decide to withdraw from the study at any time. In addition, after each interview with the school leaders they were asked a second time if their contribution could be used in the research.

Few schools participated in the study (n=10). Therefore, to avoid revealing individual schools, no information about their geographical location or any socio-economic information concerning them is mentioned in either the thesis or appended papers.

## Results

The 8-step data collection and analysis process described in the previous section and illustrated in Figure 3 (and two triangles in Figure 2) generated results that are summarized in Triangle C in Figure 4 (which shows the relations between the research questions, chosen methods, analytical process and results). A more refined understanding of which guiding principles that are needed for an implementation of transformative ESD in the school organisation was obtained with new sub results, forming a holistic picture, displayed by the rectangle (see Figure 4 column 3).

### Summary of results

The following sections briefly describe the results obtained in Steps 1-8, which are referred to as Result 1-8, respectively.

#### **Result 1**

This result comprises 26 identified QC at ESD-active schools (Paper 1). These criteria are qualities that the school leaders expressed and were therefore assumed to be important for a school organisation that promotes implementation of ESD. All identified QC are presented in Table 1, which also shows how the QC relate to criteria identified in previous ESD research.

#### **Result 2**

Each QC was rated on the basis of its importance for high quality in schools' organisation by the school leaders, expressed as a summed quality importance score (see column 4 of Table 1, and Paper 1). Highly rated QC refer to aspects that were considered very important by many leaders of ESD-active schools, while the low-rated criteria were considered less important and fewer school leaders mentioned them. In this part of the analysis, QC were analytically treated as separate variables, but in the real context they were often expressed in combinations by the school leaders. Therefore, QC with low ratings are potentially important for other criteria in school organisations. For example, *length of teaching period* may be an important modulator of the criterion *leadership focus*, which involves seeing the pupil as the starting point for school activities, requiring both long and short teaching periods adapted to the pupils' needs.

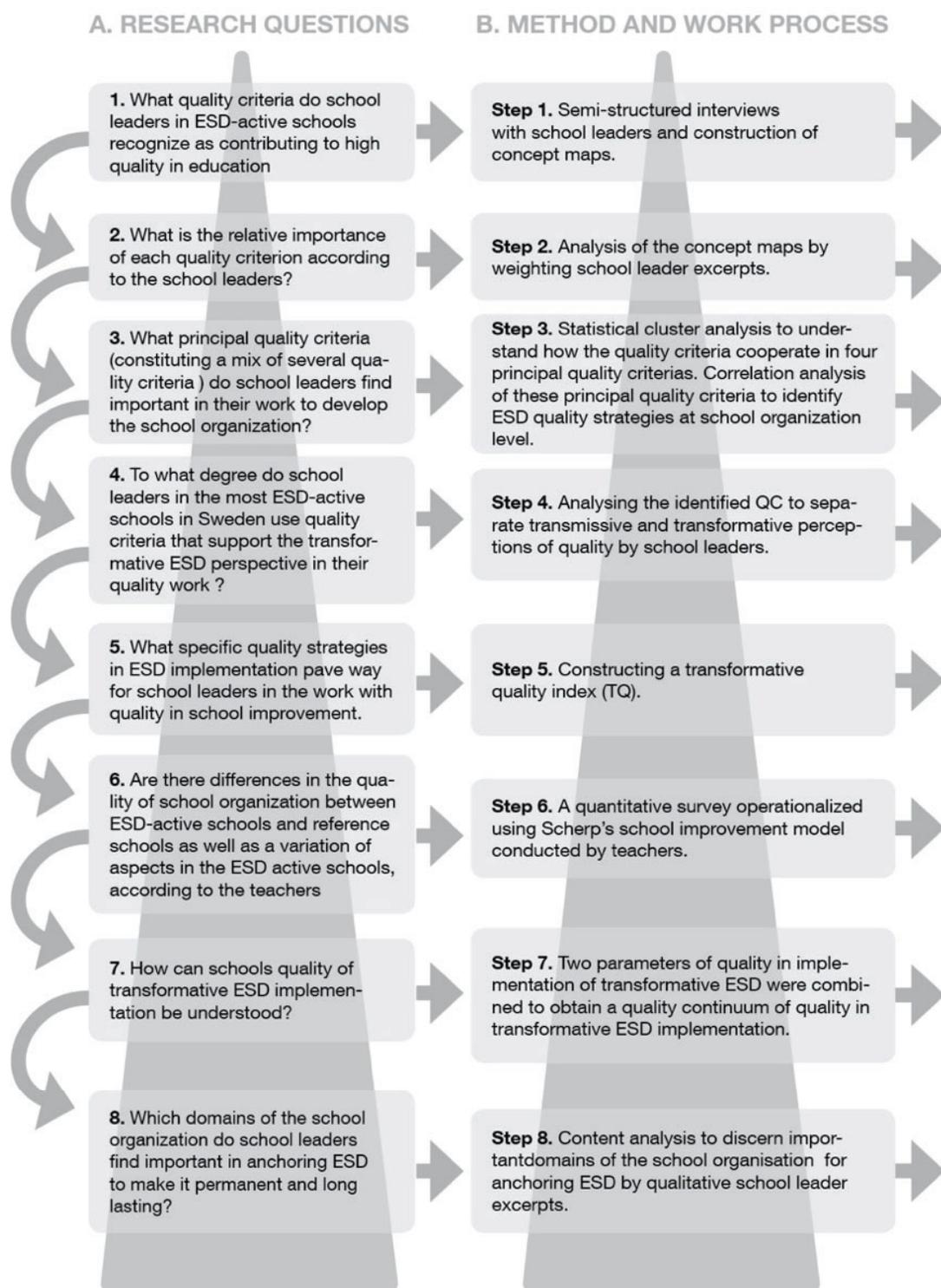


Figure 4. Flowchart of the design (Triangles A and B) and Results (Triangle C) and Contributions (Triangle D) of the research

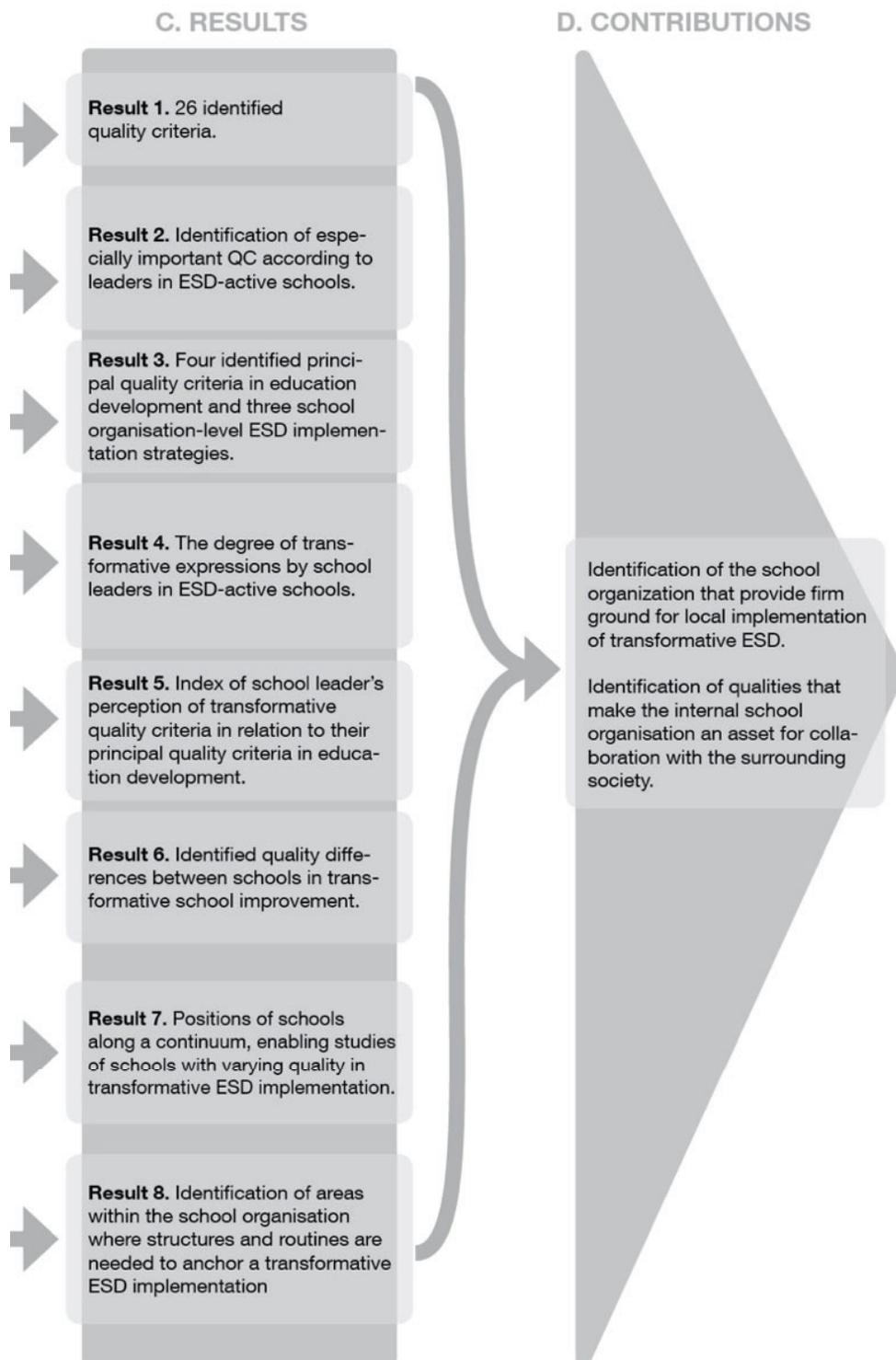


Table 1. QC identified in the research and their summed quality importance scores (column 4) based on rating of importance by the leaders of the school organisations concerned.

Rank	Identified QC	New QC or previously identified	Summed quality importance score
1	Creation of holistic idea.	Identified before <sup>1,2,3</sup>	38
2	Target for planning school organisation.	New	36
3	Team structure at school	New	32
4	Leadership focus	New	32
5	Implementation of holistic idea	New	31
6	Understanding of the holistic idea	Identified before <sup>1,2,3,4</sup>	31
7	Proactive leadership	Identified before <sup>1</sup>	28
8	School climate	Identified before <sup>1,2,3</sup>	28
9	School identity in society	Identified before <sup>1</sup>	27
10	External expectations	Identified before <sup>3</sup>	25
11	Professional networks	Identified before <sup>1</sup>	22
12	School governance	New	21
13	Long term plans	New	20
14	School collaboration with society	Identified before <sup>1,3</sup>	19
15	Role model leadership	Identified before <sup>1</sup>	18
16	ESD as a point of departure for organizing the school	New	17
17	Evaluation purpose	Identified before <sup>1</sup>	16
18	Inner conviction, vision, philosophy	New	15
19	Trans-disciplinary scheduling	Identified before <sup>1,2,3</sup>	14
20	Partial ESD implementation in school	New	13
21	School leader teamwork	New	11
22	International outlook	New	10
23	Scheduling-length	New	10
24	ESD quality measurement	Identified before <sup>1,3</sup>	9
25	Resistance to ESD implementation	New	7
26	ESD purpose	Identified before <sup>1</sup>	4

1 Cf. Breiting, Mayer and Mogensen. (2005, pp. 34–45)

2 Cf. Boeve-de Pauw and Van Petegem (2011, pp. 118)

3 Cf. Leo and Wickenberg (2013a, pp. 412–413)

4 Cf. Leo and Wickenberg (2014, p. 75)

### Result 3

Result 3 is the set of aggregated principal quality criteria, each of which combines many related criteria in an overriding category that is important for quality efforts in schools actively implementing an ESD perspective. The following principal quality criteria were identified in the study: *collaborative interaction and school development, student-centred education, cooperation with local society, proactive leadership and long-term perspective* (see Paper 1). Cronbach's  $\alpha$  values of these principal quality criteria were 0.671, 0.635, 0.778 and 0.631, respectively.

Through correlating these principal quality criteria (see Table 2) three quality strategies were identified, which encapsulate how school leaders in practice work with quality in the investigated ESD-active schools. One strategy consists of a combination of the principal quality criteria *cooperation and process-centred school development* and *student-centred education*. These mainly concern qualities within the school organisation and the strategy is therefore defined as internally oriented and termed the *internal quality strategy*.

The second strategy combines the principal quality criteria of *cooperation with local society* and *proactive leadership and continuity*. This strategy involves qualities related to cooperation with the external society outside school, so it is defined as externally oriented and termed the *external quality strategy*.

According to the school leaders one or other of these strategies was applied in nine of the investigated schools. In the other school, a strategy combining the principal quality criteria *student-centred education* and *cooperation with local society*, here termed the *external and internal quality strategy*, was reportedly applied.

Table 2. Pearson correlation matrix of the four principal quality criteria.

	Collaborative interaction and school development'	Student-centred education	Cooperation with local society	Proactive leadership and continuity
Collaborative interaction and school development				
Student-centred education	0.658*			
Cooperation with local society	0.209	0.055		
Proactive leadership and continuity	0.254	0.195	0.741**	

\*\* p < 0.01

\* p < 0.05

#### ***Result 4***

Result 4 is the total weighting of transformative QC related to the school leaders' statements (Table 3). The analysis of the school leaders' responses yielded weightings of 42-64%, meaning that 42-64% of the expressions by the school leaders in favour of QC they reportedly applied had a transformative character (see Paper 2 for more details). From the results it can be concluded that ESD-active schools are motivated by both transmissive and transformative QC, but in varying degrees. Four schools (schools 3,6,7 and 8) were represented by two school leaders to ensure the ESD implementation data met the time criteria. Some school leaders had been on duty for a short time, so former leaders were included in the research, as described in the Methodology section. In all cases but one (school 7), there was high agreement between the two interviewed school leaders. For school 7, the values of the transformative quality expressions by the former (1) and present (2) school leader sharply differed (63 and 42%, respectively). It can be assumed that the new school leader was introducing changes in the school organisation that was more structural than the predecessor (see Paper 2 for further discussion).

#### ***Result 5***

A transformative quality index was designed, called the TQ index, which indicates the frequency of expression by the school leaders of transformative qualities in the school organisation in relation to an ideal state, based on both the number of QC mentioned and their transformative weighting. The index values have strong consistency with the percentages of transformative expressions (Result 4), but greater variation due to the comparison with a conceived ideal state, that is, a school using all QC and fully emphasizing the transformative expressions. The index is used for comparisons in relation to the principal quality criteria and quality strategies used by the school leaders (see Result 4). Table 3 (column 3) shows index values obtained from responses of each school leader. There are no clear differences between values obtained for leaders applying internal quality strategies (mean index value: 0.5) and external quality strategies (mean index value: 0.6) (see Result 3). However, it was notably higher for the leader of the school combining these strategies (0.8) (see Paper 2 for more details).

Table 3. *Frequencies of the school leaders' transformative expressions of quality as percentages of the total frequency of transformative and transmissive expressions of quality at their schools (column 2). The transformative quality index (column 3) represents the level of transformative expressions of quality for individual school leaders related to a conceived ideal state for which the school leaders would have expressed all qualities as transformative at 100%.*

<b>Schools</b>	Frequency of transformative expressions as a percentage of total number of quality expressions	Transformative quality index (TQ-index)
School1	42%	0.4
School2	64%	0.7
School3 (1)*	56%	0.5
School3 (2)*	55%	0.5
School4	56%	0.7
School5	63%	0.6
School6 (1)*	40%	0.2
School6 (2)*	42%	0.2
School7 (1)*	63%	0.8
School7 (2)*	42%	0.5
School8 (1)*	64%	0.8
School8 (2)*	63%	0.7
School9	63%	0.6
School10	56%	0.6
<b>Mean value</b>	<b>57%</b>	<b>0.6</b>

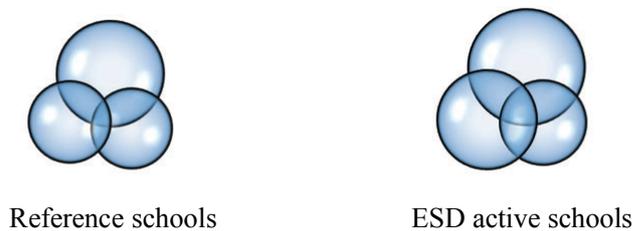
\*Some schools (column 1) were represented by two school leaders and thus are assigned two rows (one for each leader, parenthetically 1 and 2).

## **Result 6**

This result shows how teachers at the ESD-active schools with varying improvement processes, according to the school leaders, perceive quality in their schools' organisation. The Scherp model was used to investigate the relationship between *school organisation coherence* perceived by the teachers and school improvement conditions. Visualisations of the results based on the Scherp model (see Figures 5-8) illustrate the teachers' perceptions of their schools' emphasis on the underlying logic and factors associated with each of the school organisation dimensions in the model. The numerical data underlying the visualisations can be found in Paper 3. The magnitude of the mean values is indicated in the visualizations by the relative sizes of the circles, and the coherence of the school organisation by the overlap of the circles in each figure. The more the dimensions' overlap, the greater the synergy in dimensions of the school organisation and (hence) support for the centrally placed dimension, practical pedagogical work. Due to the importance of a holistic idea and professional knowledge creation in transformative education, the coherence is also an indicator of how the school improvement support transformative quality expressions in the school organisation. Further

arguments for this conclusion and the importance of a WSA (when school dimensions cohere) for transformative education are outlined in Paper 3.

Regarding the analysis of differences in school organisation between ESD-active schools and reference schools, the results indicate that teachers at ESD-active schools generally find their school improvement processes of higher quality and displays a more coherent organisations which indicates a greater potential to support practical teaching and pedagogical work than ordinary schools (according to participating teachers). This is visualised by the representation of the Scherp model in Figure 5. The overlap of all three school dimensions are larger in ESD-active than in the reference schools. ESD-active schools therefore seem to have higher transformative quality in school improvement than ordinary schools. Moreover, these results were statistically significant.



*Figure 5. Visualisation of differences between perceptions of teachers at reference schools and ESD-active schools in their schools' organisations in terms of the Scherp model. The top, left and right circles represent the Holistic idea, Routines & structures and Professional knowledge creation dimensions, respectively.*

In the comparison of *perceptions of school organisation between ESD-active schools using two different ESD implementation strategies* an interesting difference was found. Organisations of schools adopting interdisciplinary networking ESD implementation strategies seem to have a stronger orientation towards the dimension professional knowledge creation, than schools adopting ESD award implementation strategies, which rely more strongly on routines and structures. Generally, the schools with an interdisciplinary ESD strategy appear to have stronger organisational coherence than the award schools, indicating that a holistic vision is more integrated in their organisations, as recommended in a whole school approach and transformative education. Figure 6 visualises these differences.

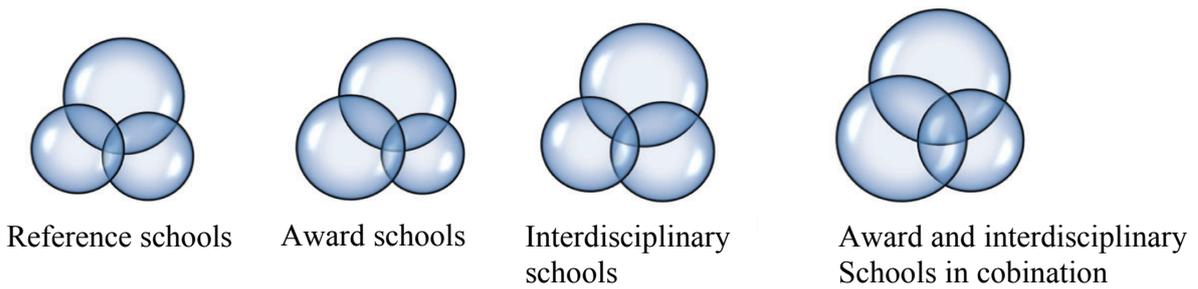


Figure 6. Visualisation of differences between perceptions of teachers at reference schools and ESD-active schools applying award or interdisciplinary implementation strategies, or a combination of both, in their schools' organisations in terms of the Scherp model. The top, left and right circles represent the *Holistic idea*, *Routines & structures* and *Professional knowledge* creation dimensions, respectively.

The comparison of schools using different general quality strategies (internal, external or a combination of both) did not provide clear indications of differences in their support for implementation of transformative ESD. To some degree this is due to missing data from two schools. However, schools with internal quality strategies tended to receive higher scores from their teachers for coherence between the *Holistic idea* and other dimensions than schools with external quality strategies, as visualised in Figure 7.

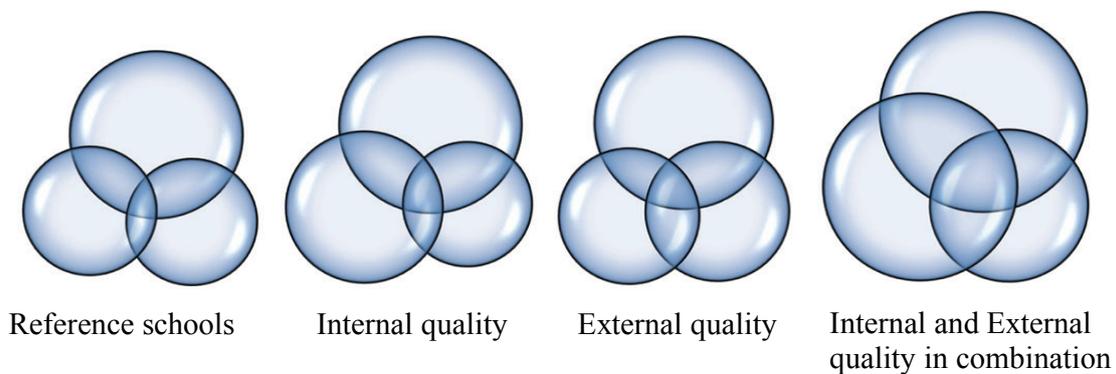
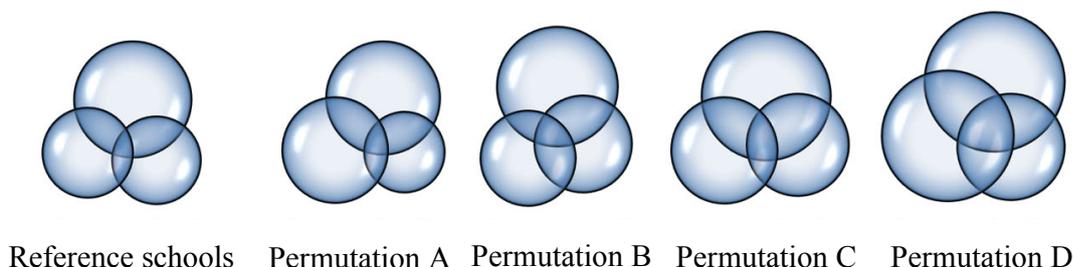


Figure 7. Visualisation of differences between perceptions of teachers at reference schools and ESD-active schools applying internal or external general quality strategies, or a combination of both, in their schools' organisations in terms of the Scherp model. The top, left and right circles represent the *Holistic idea*, *Routines & structures* and *Professional knowledge* creation dimensions, respectively.

The permutations of general quality strategies and implementation strategies identified gradient-like differences in effects on school improvement processes, as shown in Figure 8 and described in Paper 3. The combination of internal and external quality strategies together with award and interdisciplinary ESD implementation strategies (permutation D, Figure 8) yielded the highest coherent school organisation ratings. This suggests that pluralistic perspectives in the school organisation could be advantageous for implementing transformative ESD. Moreover, the integrated quality strategies

are probably the most important contributors to the outstanding results for the single school with Permutation D, because the high scores obtained for the combined award and interdisciplinary schools in this analysis are mostly due to results for this school, although two schools matched the specific ESD implementation strategy.



*Figure 8. Visualisation of differences between perceptions of schools' organisations, in terms of the Scherp model, of teachers at reference schools and schools applying four permutations of school improvement processes: A, internal general quality strategies and award implementation strategies; B external general quality strategies and interdisciplinary implementation strategies; C, internal general quality strategies and interdisciplinary implementation strategies; D, internal and external general quality strategies in addition to a combined award and interdisciplinary strategy. The top, left and right circles represent the Holistic idea, Routines & structures and Professional knowledge creation dimensions, respectively.*

### **Result 7**

Combining data elicited from both school leaders and teachers was regarded as an important methodological element in this research. In Step 7 of the process, school leaders' responses regarding transformative quality in the school organisation (Result 4) and teachers' responses regarding their school organisations' adoption of transformative quality in school improvement processes (Result 6) was combined (see Paper 4). Together these measures enabled schools to be placed along a continuum of transformative quality in their organisations, as expressed by both school leaders and teachers (Table 4). Schools were then clustered in groups with varying focus on transformative quality in their organisations as a starting point for ESD implementation (see Figure 9, and Table 4 for details of the continuum's construction).

Table 4. Measures of the two parameters of transformative quality in ESD: teachers' perceptions of their school organisations' and coherence in school improvement (vertical axis), and TQ index, based on school leaders' perception of transformative qualities in their schools' organisation in relation to an ideal state (horizontal axis).

TQ index by school leaders

		< 50%	≅ 60%	> 70%
School organization coherene by teachers	< 2,5 (average= 2.44)	3 schools		
	> 2,5 (average 2.63)		2 schools	
	> 3,0 (average 3,10)			3 schools

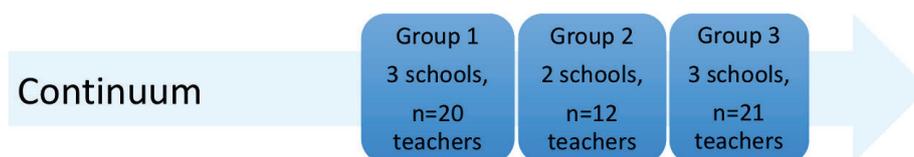


Figure 9. Continuum of schools based on the two measures of ESD implementation of transformative quality as presented in Table 4. Schools in group one represent low levels of transformative quality, while the schools in group three represent high levels of transformative qualities.

### Result 8

Finally, comparative analysis of how school leaders anchor ESD in schools with high and low focus on transformative quality in their school organisations was conducted (Paper 4). The results show differences in beliefs of leaders of the two sets of schools regarding the QC that should be emphasized to raise quality in ESD implementation. The QC that were strongly favoured by school leaders of each group for anchoring ESD in schools (with high transmissive weighting) were identified, and used in conjunction with analysis of the school leader interview data to identify important domains for anchoring quality in ESD implementation.

Leaders of schools with high transformative quality in the organisation expressed needs for structures and routines in the domains of *internal holistic idea*, *collegial approach* in the school organisation, and *active school leader protection* of ESD. They strove to anchor quality in their schools' organisations by ensuring the ESD perspective was given a central position in the organisation, thereby fostering the formation of new and supporting structures and routines in the organisation.

Expressed motives of leaders in schools with a low focus on transformative quality in the school organisation could be called 'lowest common denominators': all persons working in the school knowing that their school is implementing ESD, without many being personally engaged or involved in ESD-related work. Domains highlighted by these school leaders as important anchors include *individual responsibility* that is *conditioned top down* and *progression is led by the leadership* of the organisation. Leaders of schools with a low focus on a transformative quality in their school organisations also expressed a temporary stage in ESD implementation by presenting thoughts on how the school could *progress by leadership directives*. From the selection of schools, it is known that the implementation process has been running over many years. It seems hard to challenge and scale up ESD implementation to the involved schools, and there is a risk of current structures and routines in the organisations leading to a dead end of qualitative ESD implementation. The primary goal of a top down and individualistic approach of anchoring ESD is to circumvent resistance to implementation of ESD within the school organisation.

### ***Guiding principles in the school organisation that promote implementation of transformative ESD***

The following points (a-f) summarize the refined understanding of how the results presented in column 3 of Figure 4 can be viewed as guiding principles for implementation of transformative ESD.

- a) The school organisation should provide structural support that encourages collegial meetings and collaboration of individuals (Results 1, 2, 3 and 8; Figure 4).
- b) A holistic idea or vision, not only instrumental but living and shared, is crucial. Members of the organisation should be continuously reminded about it, and it should be used to legitimize the school's way of organizing education to outside actors (Results 1, 2, 6 and 8; Figure 4).
- c) A holistic idea or vision is also important for ensuring that the whole school organisation is framed, interlinked and in tune, with all parts actively contributing to the practical teaching and learning (Result 6; Figure 4).
- d) The internal structures and quality processes in a school's organisation provide important foundations for links with external actors and approaches to raise educational quality in ESD-active schools (Results 1, 2, 3, 5, 6 and 8; Figure 4).
- e) The internal planning and management of a school organisation should be student-centred, with emphasis on teamwork and process learning to facilitate students' development as active drivers of educational processes linking education to the outer society (Result 3; Figure 4).
- f) Proactive leadership is important for connecting educational organisations to the outer society to identify knowledge that is currently important for young individuals. The leadership is also important in legitimizing and justifying the work with ESD. (Results 1, 2, 3; Figure 4).

## Discussion

### Main contributions

This thesis is based on studies of the prerequisites for implementation of ESD, and more specifically the organisational requirements for implementation of transformative ESD. To answer the question *What guiding principles in the school organisation promote implementation of transformative ESD?*, components and qualities in schools' organisations were sought that can be said to constitute the 'firm ground' required for robust, continuous, fruitful implementation of ESD that is flexibly responsive to emerging needs in the external society (Fullan, 2001; Scott & Gough, 2010; Scott, 2013). The guiding principles are needed to avoid education becoming outdated, counter-productive and falling short of young individuals' needs to meet future societal challenges (Lotz-Sisitka et al., 2015). Based on the identified guiding principles, the results provide the following main contributions.

The first contribution is identification of the school organisation that provide firm ground for local implementation of transformative ESD. *Collaborative interaction and school development, student-centred education, cooperation with local society and a proactive leadership* are identified guiding principles that support relevant processes and change in how education is planned and managed in the school organisation. Domains especially important for anchoring ESD in the school organisation structures and routines, of equal importance to school leaders, were also identified. These anchors include instrumental *holistic vision, routines that support the collegial approach, and protection of ESD by the school leadership*. Together these guiding principles ensure that the requirements for implementation of transformative ESD are met over time, independently of the individuals in the organisation, as they are firmly set in the school's routine planning and management. The identified guiding principles both acknowledge earlier findings, e.g. the importance of a holistic idea (Breiting, et al., 2005), but add new knowledge about how the firm ground can be established in the school organisation. Participating school leaders expressed a need to facilitate sharing, understanding and implementation of the holistic idea. The teachers asked about quality in school improvement confirmed the need to manage multiple aspects of the school organisation and fully embrace a holistic idea to promote collaboration.

The second contribution is identification of qualities that make the internal school organisation an asset for collaboration with the surrounding society, which has recognized importance for implementation of transformative ESD (Breiting, et al., 2005; Elliot, 1999; Shallcross et al., 2006). The results indicate that structures and processes in the school organisation that promote student participation in planning education are required before fruitful engagement in external societal issues can be an asset for education. Schools that claim to collaborate strongly with the outer society, but lack these internal structures and processes or do not prioritize them, seem to use such collaboration mainly as a flagship or label for ESD rather than truly contributing to school improvement.

Analysis of data pertaining to the schools with the highest transformative quality in the organisation showed that they used instrumentalist transmissive goals for transformative purposes (Paper 4), indicating that their organisations had strong structures and routines, despite earlier research claims that they may hinder transformative education (Jickling & Wals, 2012; Lotz-Sisitka et al., 2015; Scott, 2016). Thus, anchoring prerequisites of ESD (a school's holistic idea and collaborative work in instrumental structures and routines ensuring that the perspective is maintained and not neglected) is also apparently important, as previously discussed by Nikel and Lowe in terms of transmissive and transformative quality in a school's organisation (2010). What it actually means in practical settings is shown in this study. The main findings regarding this premise are discussed in the following section.

### **The firm ground of the school organisation**

The contributions of the study reveal what is meant by the tight framing of a school's organisation that is adopting ESD by adjusting its forms and functions, as theoretically suggested by Scott (2015). Four principal quality criteria verified by school leaders were identified (Paper 2), in addition to three anchors of transformative ESD (Paper 4). Together they contribute to knowledge of what constitutes the firm ground in the school organisation for implementation of transformative ESD.

School leaders indicated that *collaborative interaction and school development* build on the shared understanding of a holistic idea within the school, i.e. a common goal or vision shared by all of the staff, not only instrumental but living and shared in line with (Leo & Wickenberg, 2014). Members of the organisation must be continuously reminded about it to ensure that the whole school organisation is framed, interlinked and in tune, with all members (including students) actively contributing to the practical teaching and learning. Anchoring ESD in the school organisation by a holistic vision or idea means that school development over time has a specific direction (towards ESD). The teachers representing schools with high transformative quality in their organisations strongly emphasized the importance of a holistic idea or vision of education in the school organisation in the survey study (Paper 3). In school improvement research, a holistic idea or vision is regarded as the foundation of decisions to adopt, extend or abandon new perspectives in education. For example, according to Scherp (2013a), a new educational process has to be started to respond to each new educational suggestion or initiative. However, a holistic idea that is maintained and known can provide foundations that help the process to persist and develop due to the new knowledge that is continually added. Judgements of what fits with the vision or idea determine which new educational perspectives can be added (Scherp, 2013a). Paper 1 highlights the recognition of its importance by leaders of ESD-active schools, indicating that school organisations seeking to implement ESD should make strenuous efforts to incorporate a holistic vision. Thus, a holistic idea or vision of ESD is clearly crucial, as corroborated by the results that the school organisations with the highest transformative quality had the highest

scores for coherence of the considered dimensions of school organisation (Paper 3).

A second requirement for the firm ground of school organisation in implementation of transformative ESD is *student-centred education*. According to the school leaders, students must be seen as central in organisational planning. This means making space for including students in planning education as well as the learning environment, and taking time to understand students' backgrounds. The analysis of the investigated schools clearly shows that student inclusion is an important element of the firm ground of an organisation based on learning rather than teaching (and hence ESD). Teams of teachers working closely with students in activities and processes focused on subjects and schedules are highly important, but secondary to creation of a platform that is safe and supports students' learning. The firm ground of student inclusion identified in this thesis is created by school leaders striving to involve teachers and students in the organisation of school activities. ESD is anchored by collegial approaches, where school leaders' transparent work procedures provide a role model for teachers and students. The school leaders also emphasized that several kinds of support are needed to engage and involve students in implementation of ESD. These include instilling confidence in teachers to try new ways of teaching, and creating a collegial approach in which fostering student inclusion is a common task for the whole team.

Another identified element of the firm ground in implementation of transformative ESD is the school leader's *cooperation with local society*. Relationships between the school organisation and the society make schooling 'authentic' or real to those involved in education. The school leaders interviewed in this study indicated that cooperation with society is a way of displaying the school's work and seeking legitimization by the outer society for the work with ESD.

A *proactive leadership* style was also identified as an important element for forming the firm ground in line with results by Leo and Wickenberg (2014). The participating school leaders expressed the importance of proactively taking responsibility not only for the organisation of education within their schools, but also for leading the pedagogical efforts, together with teachers and students. As mentioned above, the collegial approach is an important anchor of ESD. The participating school leaders also stated that they used networking partly as a way to compare their own schools' standards but mainly to obtain and exchange new ideas about school development in relation to society.

Several of the studies underlying this thesis addressed school leaders' decisions to raise the quality of their schools over time by using external actors and resources, such as award or implementation schemes, to develop their schools' organisations. They indicated that this provided a way to seek assistance in meeting educational needs and addressing problems proactively, rather than reactively. The school leaders challenged the students and staff, for example, to engage collaboratively in external societal and

internal school trends that reinforce educational and learning capacities to meet future dilemmas.

### **Barriers to implementation of transformative ESD**

Several barriers to implementation of transformative ESD were also identified in the studies. These include guiding principles expressed by leaders in schools with low emphasis on transformative ESD, such as *promotion of ESD by school leadership, top down management and individual responsibility* (anchoring ESD to individual, leaders or teachers within their organisations). These guiding principles clearly conflict with ideas of the firm ground found in schools with implementation of highly transformative ESD (collaboration and shared holistic ideas or visions). Leaders in less transformative schools had often delegated responsibility for implementing ESD to the teachers.

Moreover, responses of both school leaders and teachers indicated that complex issues like ESD were often treated and understood by school leaders and teachers separately, rather than holistically. This is far from ideal, as ESD can be viewed from social, economic or ecological perspectives, as well as in terms of specific contents and/or abilities in education, but an integrated approach is essential to realise its transformative potential (Nikel & Lowe 2010). In partial ESD implementation in school organisations, a limited number of individuals or school programs are involved. In fact, roughly half of the selected ESD-active schools with a more transmissive quality focus appeared to adopt an individualistic approach to supporting ESD (giving single teachers, selected teams of teachers or individual school leaders responsibilities for implementing it). These schools appeared to have high levels of transmissive quality structure and routines related to ESD (Papers 1 and 2), being managed (for example) in a hierarchical and top-down manner, according to the surveyed teachers (Paper 3). These findings provide quantitative corroboration of previous claims that structural elements can promote or constrain implementation of transformative ESD (Hargreaves, 2008; Iliško & Badyanova, 2014; Mathar, 2013; Shallcross, 2005).

A conclusion is that lack of consensus regarding ESD within these organisations is a barrier that hinders implementation of transformative ESD, and even enables development or continuation of resistance to it. Knowledge of the identified obstacles to establishment of the firm ground of its implementation is important for school leaders and policy developers introducing ESD implementation programs.

Since the selection of schools for inclusion in the studies was based on recognized implementation of ESD in consulted registers, the schools with a transmissive focus had been implementing ESD for some time, without progressing to a transformative focus. New kinds of support from, or facilitation by, the school organisation might be needed to promote more collegial and less individual approaches, for example. The transmissive elements seem institutionalized and difficult to challenge. Innovation and progression in schools are often driven by specific budgetary allocations and high expectations of external stakeholders, and less often on schools' own motivation to change (Giles & Hargreaves, 2006). It may be difficult to instil

motivation to progress and change in such schools due to weak overall coherence in the school organisation and scattered responsibility for ESD.

### **Internal school organisation and the asset of the outer society**

Results presented in this thesis indicate that the internal quality, structures and processes in a school organisation determine whether or not students are given the opportunity to make the outer society an asset in their education.

The identified contribution that inner structures of a school's organisation seem to play a key role in its ability to establish links with the outer society is important because the ability to use external approaches in raising educational quality is regarded as a crucial step in ESD implementation (Lotz-Sisitka et al., 2015; Scott, 2013). Encouragement of external links at all levels is a major plank of ESD initiatives generally, in research, on policy and non governmental organisation level (Keep Sweden Clean 2014; Sund & Wickman 2011; Swedish National Agency for Education, 2015; UNESCO, 2014c).

Of all the studied schools, the one with the strongest bonds between society and its inner organisation also had the highest transformative organisational quality, with organisational routines and structures that supported students' active participation in connecting education to the outer society. This supports theoretical conclusions that student participation and action in real-life settings are important for transformative education (Mogensen & Schnack, 2010). Arguments by Wals (2018) that successful school development in line with ESD is closely linked to societal movements and network systems with the local society were also supported by the studies, but less strongly than expected. Therefore, it is important to identify the guiding principles that help schools to connect to the outer society in a collaborative and inclusive manner (for example, continuous scheduling for teachers and students during semesters, largely thematic and interdisciplinary education, and joint planning by teachers and students). Recruiting teachers to project ESD in education and rally political support to make ESD a central plank of education is also helpful. School internal organisations of high transformative quality tended to embrace routines of collaborative actions and a holistic vision that included striving to foster processes that enabled a high level of transformative change and development in education.

Another way to increase the influence of schools' collaboration with society on students' learning identified in the research is to strive to create and maintain a coherent school organisation. This means that all elements, actors and processes of the organisation support each other, and that relevant external actors, ideas and trends are readily incorporated and tested in teaching and learning situations. This contribution is based on findings regarding theoretical dimensions of a school organisation that are important for implementation of transformative ESD according to teachers (Paper 3). In particular, ESD-active schools appear to have more coherent organisations with greater potential to support practical teaching and pedagogical work that includes students than ordinary schools. ESD-active schools with a higher transformative quality also appeared to have more coherent organisations than

schools with less transformative quality. These results based on teachers' views are corroborated by indications, reported in Paper 2, that internal organisational quality work is particularly crucial. Guiding principles for the internal structures and processes in ESD-active schools concern strong emphasis on teamwork and process learning, and arrangement of staff around student groups, aiming to maximize the education's meaningfulness for them by bridging subjects and timeslots in the schedule to promote interdisciplinary education. These results are also consistent with other studies (Wesselink, Wals, & Frijters, 2019), but novel aspects include identification of the importance of relationships between students and staff for transformative quality in education.

The habit of continually adjusting internal organisational processes seems to facilitate schools' establishment of bridges to society, and development of students and teachers who flexibly respond to their surroundings and educational processes. This corroborates general recommendations for implementation of ESD (Lotz-Sisitka et al., 2015). A conclusion in this thesis is that inner structures that provide the 'firm ground' in the school organisation (Scott, 2013) are required for schools to implement ESD in a transformative manner, and a school can only embrace signals from the outer society when such supportive structures are in place, enabling students' acquisition of new knowledge and learnings.

### **Theoretical implications**

In this section the theoretical implications of the study are discussed.

#### ***Application of school improvement approaches to investigate ESD***

In research, the tools used constrain the knowledge that can be produced (Huckle, 2009). The tools used in the studies underlying this thesis are derived from school improvement research, in which core questions concern highly relevant dimensions of school organisation quality that influence education (Harris & Chrispeels, 2008; Riddersporre & Erlandsson, 2016). School improvement research methods and tools were therefore applied in efforts to understand specific principles associated with the dimensions (e.g. structures, routines and processes) of school organisation that influence implementation of ESD.

Most of the schools included in the studies, which are among the top upper secondary ESD schools in Sweden, only seemed to have partially prepared the 'firm ground' that Scott (2013) claims is required for incremental implementation of ESD. In the ultimate stage education plays a central role in societal development, as schools are organised in a reciprocal relationship with the outer society that also sees education and school institutions as developmental resources. In accordance with claims by Fullan & Stiegelbauer (1991), changes in schools' organisation are needed to realize this ideal transformation of education oriented to meet society's needs and ensure high educational quality. The empirical results presented in this thesis highlight guiding principles in the school organisation for meeting these needs by both

facilitating implementation of transformative ESD and raising educational quality from a school improvement perspective. School improving actions should be based on beneficial interventions ('what works') (Scheerens & Demuse, 2005), and examples (according to the participating school leaders and teachers) include a holistic idea, collaborative approach, internal structural quality approaches and school leaders' protection of ESD implementation. In school improvement terms, beneficial systematic change (what works for the professionals and students) should be the key objective (Harris, 2013). These claims, and the empirical results presented in this thesis, clearly highlight the utility of theories and tools derived from school improvement research for studying what constitutes the firm ground (requirements for educational change) for transformative ESD.

In attempts to understand ESD implementation, student outcomes have often been studied (Berglund, Gericke & Chang Rundgren, 2014; Cincera & Goldman, 2018; Gericke, Boeve-de Pauw, Berglund & Olsson, 2019). In investigations of students' learning outcomes, direct questions regarding ESD are often addressed. In the work underlying this thesis, the concept of quality applied in school improvement research was used to investigate QC associated with positive student outcomes. For this, views of school leaders and teachers were elicited in interviews and a survey, respectively. Advantages of using QC in this manner include the possibility to link ESD to school improvement, elucidate quality requirements for ESD implementation, and identify current emphasis of transformative quality implementation in schools' organisations. The identification of schools with high and low focus on transformative quality enabled analyses not only of guiding principles in the school organisation for implementation of transformative ESD, but also barriers hindering it in schools' organisation (Papers 2 and 4).

The conceptual mapping applied in the research is recognized in school improvement research as an effective method for identifying new and unknown qualities in a schools' organisation (White & Gunstone, 1992). In addition to studying already known qualities, this openness to potentially new qualities in ESD-active schools, enables identification of qualities in schools' organisation that facilitate ESD implementation. The approach is holistic in that new qualities can be detected that are difficult to discern by studying single phenomena (Hargreaves, 1995). Four principal quality criteria were identified by clustering QC expressed by school leaders, representing the foci of quality work in their respective schools' organisations. In this way the quality concept was used to identify combinations of OC of a school's organisation that are apparently important for implementation of transformative ESD.

The school organisation model by Scherp & Scherp (2007) applied in the teacher survey was also derived from school improvement research. The model was used to assess the quality of school improvement in a holistic approach involving investigation of multiple dimensions of schools' organisations and their whole organisations at the same time. The dimensions of the model can be linked to important features of transformative ESD, e.g. process and change as well as a holistic idea of ESD in the school organisation.

It can be used to assess progress towards implementation of transformative ESD in a school organisation, and results obtained with it indicate a strong correlation between high quality school improvement and high transformative focus in the organisation (as outlined in Paper 3).

### ***A school improvement foundation deals with normativity in ESD implementation***

Introduction of a school improvement framework to interpret ESD implementation provides a way to emphasise the change and process of the 'E' in ESD to equip learners to become active participants in the building of new and better societies (Barrineau, Engström & Schnaas, 2019, Jickling & Wals 2012; Wals & Jickling, 2009).

Social, economic, political and/or cultural goals may be promoted in ESD-related policy documents, and education is seen as an arena in which such goals can be realised. Examples mentioned in ESD literature include social inclusion of cultures, ecological consumption and a circular economy. Intentions are then to change society by modifying behaviour rather than supporting learners' independent thought through education. ESD research can be perceived as normative in that policy documents with agendas and directions are actually what is studied in the field. There is a fine balance in education between indoctrination and explorative thoughts, which is set by the way education is interpreted (Biesta, 2015). Presenting a 'right way' to approach a certain societal problem constrains the abilities that are fostered in education. The learning process is then neglected as measures of societal change are emphasized rather than the quality of the learning process.

Normativity is difficult to avoid in ESD implementation research, as changes in attitude are the core concerns. This is problematic for attempts to establish connections between ESD research and the broader field of educational research. In efforts to handle the norm-critique, Sund and Lysgaard (2013) suggest connecting ESD research to educational philosophy research, and more specifically incorporating consideration of learners' interest and views of key concepts, such as student participation. This way of approaching ESD implementation in research is still normative, due to the explicit desire to progress towards a sustainable future through education, but the end result is open-ended, so the research can avoid the critique of being too normative or political. Another philosophical approach that ESD implementation research would benefit from is equipping learners with a wider understanding of their own practice (Breiting, et al., 2005; Nikel & Lowe, 2010; Pigozzi, 2007).

Concepts that are widely used in school improvement research were used in the studies this thesis is based upon, and are advocated for further studies as parts of the theoretical foundations for ESD implementation research. The search for quality, as defined in school improvement research, was based on practical actions and the voices of professionals in the studies. The theoretical framework applied in the thesis and underlying research is not free from normativity, since there is a desired direction, to raise quality, but it is open-ended and based on practitioners' needs.

### ***WSA interpreted through a school improvement lens: What can be learnt?***

While the 'E' in ESD needs special attention to avoid ESD becoming too normative or political, as discussed in the last paragraph, there is also a need to consider how the 'SD' is embedded in the school organisation. ESD has a direction, in its promotion of 'SD', sustainable development (Mc Keown & Hopkins, 2003). A theoretical framework rooted in school improvement research was applied in the studies underlying this thesis to enable research on the 'E' in ESD implementation, and is advocated for use in further related studies. School improvement research tools and educational philosophy research, as presented by Sund & Lysgaard (2013), deal with the process of reaching educational goals in the most effective way for the learners, i.e. how schools improve from their current level to another, better, level (Creemers & Reezigt, 1997). The quality of the goal itself receives less attention in school improvement research, since the primary concern is the optimal way to improve. In ESD, the goal (sustainable development) is important as the target of what can be considered sustainable is constantly changing. Results presented in this thesis, and the theoretical foundations, clearly indicate a need for a framework that explicitly recognizes the directional element (sustainable development) as a flexible goal (or multi-dimensional set of goals), while facilitating consideration of the educational process involved in reaching the goal(s).

Results presented in Paper 2 show that even the most ESD-active schools, such as those included in the studies, have limitations in how well they link education to the local society. There are few educational frameworks that consider schools' collaboration with society, but it is a central feature of WSA ESD (Elliot, 1999; Shallcross et al., 2006), and strong bonding to society is regarded as a core feature of ESD (Manni, 2018; Schnack, 2000).

The results also confirm the previously noted importance of a holistic idea for ESD implementation (Breiting, et al., 2005), which indicates a possibility to establish the direction of ESD. The characteristic components of WSA ESD, as defined in this thesis (policy transparency, continuous professional development, participation, action and progression of education, and educational relevance to the wider society) constitute the educational means (the 'E' in ESD) to attain ideal sustainable development. The holistic idea in many of the investigated schools was found to align with and support the holistic idea and vision of WSA ESD, thus a holistic idea seems helpful in establishing WSA ESD.

While writing this thesis, new research on characteristic features of a WSA ESD have been published. In a case study based on a single school, Bosevska & Kriewaldt (2019) add the importance of outdoor and place-based learning. In addition, a study focused on three schools in an early stage of implementation of a WSA ESD, presented by Wesselink, et al., (2019) at the AERA conference in Toronto, identified (*inter alia*) a need for teamwork to realize a WSA (confirming the finding presented in Paper 1 that this is an important QC for school leaders in ESD implementation). Bosevska and Kriewaldt (2019) have used thoughts of Sterling (2003) and Von Bertalanffy

(2003) that a systemic way of thinking and relating to SD could have effects on the entire school organisation. They demonstrated that a shift from education and school reform towards a whole vision of education based on schools and communities working together is needed. Both of these recent WSA ESD studies note the difficulty in embedding SD in the whole school organisation. Viewing WSA through a school improvement lens, as an approach that supports a holistic idea and vision of ESD, could be a new way to judge and understand WSA in ESD research. However, more empirical research is needed to understand how entire school systems and processes could embrace sustainability in a true WSA.

## Conclusions and recommendations

This section provides conclusions and recommendations that school leaders, teachers and policy-makers engaged in implementation of transformative ESD may find useful, based on the presented results and contributions of this thesis. None of the recommendations is regarded as a single comprehensive solution to increase transformative ESD in the school organisation. They are regarded as measures that can be applied and/or qualities that can be fostered in conjunction with each other to promote transformative ESD throughout the whole school organisation. An important conclusion is that the investigated schools anchor ESD in their structures and routines, which permanently roots transformative ESD in the school organisation. This helps to meet the calls to address a lack of knowledge about how ESD becomes permanently embedded in a whole school organisation (Bosevska & Kriewaldt, 2019). Previous ESD implementation research has found that self-regulation, and establishment of high levels of trust and freedom to learn and experiment are fruitful ways to maintain ESD in the school organisation (Wals 2018). Results presented in this thesis show that process-oriented implementation of transformative ESD, as described by Wals (2018), is reinforced by instrumental ways to anchor ESD in the school organisation. It is therefore difficult to separate the following recommendations. For example, the structural holistic idea supports efforts to ensure that the idea is living and shared in processes within a school organisation.

An important contribution in this thesis is the identification of guiding principles in the school organisation for implementation of transformative ESD. Earlier research has shown that current recommendations and investments in ESD implementation programmes have limited effects on student outcomes (Boeve-de Pauw & Van Petegem, 2011a; Boeve-de Pauw, et al., 2015; Warner & Elser, 2015). Better ways to support it have therefore been sought in the whole school organisation. The interpretation of ESD through the school improvement theoretical framework indicates processes and structures in schools' organisations that need further attention in this respect.

### Recommendation 1:

Emphasis on transformative qualities in promoting change, process, renewal and openness towards what is unknown and new in the school organisation should be seen as equally important to the transmissive and structural qualities found to anchor implementation of transformative ESD.

Most of the participating school leaders said that only parts of their schools were involved in ESD implementation (Paper 1). The school's engagement in ESD was commonly described as an intention to share good examples. This partial and sometimes individualistic approach to ESD is shown in Paper 4 to be a possible barrier to the realisation of a WSA ESD. The paper also identifies the importance of structures and routines that anchor a collaborative and

sharing culture of ESD initiatives, and an understanding of ESD as part of something larger, an idea or vision permeating the school organisation, for permanent ESD implementation. Paper 4 contributes understanding of where in the school organisation structures and routines are needed to accomplish implementation of a transformative ESD over time. For example, structures to make the leadership protective rather than promotive of an ESD perspective seem important for schools with high transformative quality in their organisation (Paper 4).

**Recommendation 2:**

Implementation of transformative ESD benefits from structures and routines to make ESD permanent in the domains of school organisation where collegial work is organized, and routines for collaboration within education and the surrounding society are set. Structures are also needed to make the holistic idea and vision lasting and living in the school organisation, so it is not neglected or forgotten in daily work.

**Recommendation 3:**

Proactive leadership that legitimizes and protects the process of implementation of transformative ESD is important for creating structures and routines that embed ESD in the school organisation.

Another contribution regarding WSA ESD concerns requirements for ESD to secure quality in education (Jucker & Mathar, 2016). Quality measures of transformative ESD in the studies were based on both teachers' (Paper 3) and school leaders' expressed opinions on quality issues in their school organisations (Papers 1, 2 and 4). Paper 2 shows that quality in relation to ESD is raised when the internal quality strategies in the school organisation synergistically interact with quality strategies related to the outer society. The quality of teaching and learning practices for students is then found to improve, as shown in Paper 3. This organisational synergy, empirically identified in one school in the study (Paper 2), was found (qualitatively) to be highly regarded by both leaders and teachers at this school (Paper 3).

**Recommendation 4:**

The internal quality strategies in the school organisation should synergistically support the external quality strategies involving the outer society. Links to society and collaboration with external stakeholders can contribute to raising quality in the school organisation.

The operationalized model of school improvement (Scherp's model) used in the studies provides an example of how WSA in a school organisation can be understood. It measures the coherence of organisational dimensions and predicts if students are affected in implementation of transformative ESD (Paper 3). This provides a holistic approach to understand how sustainability

can become part of the ordinary school improvement process rather than an optional educational perspective. The operationalized model can be used to assess if a school's organisation is loosely framed, in that structural and instrumental barriers prevent collaborative deliberation on the way transformative ESD is to be implemented.

**Recommendation 5:**

Tools to assess and judge quality requirements in a school's organisation are needed before introducing advice for implementation of transformative ESD. They are needed to locally adopt implementation and avoid costly and ambitious initiatives without the required conditions to succeed in meeting students' needs. Reasonable expectations of ESD implementation can then be formulated and met.

The use of school improvement research tools and methods in ESD contexts sheds new light on the role of the school organisation in implementation of transformative ESD. The conclusions are based on educational practice, as called for by Mogensen and Schnack (2010) and Vare and Scott (2007).

**Recommendation 6:**

A school organisation with an interdisciplinary ESD implementation approach is required, as collaboration of all teachers and synergistic linking of subjects supports implementation of transformative ESD.

**Recommendation 7:**

Student-centred planning and management in the school organisation and process-oriented school development, involving testing and evaluation of new ideas also seems advantageous for implementing transformative ESD.

Education is not seen as a direct tool to change society in the WSA conception, but as a means to adjust the knowledge of learners to become more relevant to their future life and action in the society (Shallcross, 2005). Through the suggested WSA ESD conception and school improvement research tools, requirements for collaboration between school institutions and society that raise quality in education can be understood. This meets needs for more knowledge of collaboration with society in ESD as a contributor to quality in whole school organisations, as recognized in both ESD policies (UNESCO, 2014c) and research (Lotz-Sisitka et al., 2015). The capacity of the framework to meet these needs is illustrated by the empirical results presented in this thesis (Paper 3). Collaboration improving education quality is distinguished from collaboration that merely labels a school organisation work on ESD without affecting learning process, although there were limited examples of collaboration in most of the studied schools.

#### Recommendation 8:

There is a need for differentiated ESD implementation programs based on school organisations' openness to society and the degree of transformative quality in their internal strategies. Efforts to secure internal quality structures that are tightly framed in the organisation should precede efforts to make connections with the local society. Although social collaboration is an important element of ESD implementation, schools tend to fall short in raising quality for students by forming collaborations with society that are loosely aligned to the inner school organisation, or mainly only involve the school leader.

#### **Implications for future research**

The practical aim of the guiding principles in the school organisations outlined in this thesis is to equip learners with a sense of responsibility and freedom to act and address future real-life issues, even during their schooling (Biesta, 2015; Wals & Jickling, 2009; Uzzell, 1999). However, this aspect of transformative ESD was not directly investigated in the studies (only its organisational underpinnings), and it requires further analysis. Results presented in this thesis also indicate a need to investigate reasons why highly ESD-active schools do not connect as strongly to the outer society in raising the quality of their organisations as recommended in transformative ESD research (Lotz-Sisitka et al., 2015). The results confirm previously discussed difficulties in establishing such links.

More empirical studies based on an educational framework that includes mechanisms to understand degrees of transformative qualities are also needed. Such studies could build understanding of how schools can progress to social collaboration from various starting positions of transformative quality in the school organisation.

Finally, more research is needed to find out how ESD research can be based in theoretical foundations of other research fields, like school improvement theory (as reported in this thesis). This would improve the robustness of ESD implementation research and reduce risks of its politicisation and normativity (which arise because the research is often built on ESD policy).

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# Guiding Principles of Transformative Education for Sustainable Development in Local School Organisations

This thesis investigates the guiding principles required in the school organisation to make a permanent implementation of transformative Education for Sustainable Development (ESD) possible, while aligning with a whole school approach. Swedish upper secondary schools actively implementing ESD were selected for the study.

The research design consists of a mixed method approach that was developed from the field of school improvement research. The methods used include semi-structured interviews with school leaders and questionnaire surveys with teachers. School leaders' and teachers' understanding of quality in their local school organisation was studied, and the guiding principles promoting transformative ESD were identified. These include four principal quality criteria that need structural support through collegial meetings to establish a holistic idea of ESD in the organisation: collaborative interaction and school development, student-centred education, cooperation with local society, and proactive leadership and long-term perspective.

The two main contributions are 1) identification of the school organisation that provide firm ground for local implementation of transformative ESD, and 2) that the internal school organisation is a prerequisite for school collaboration with the surrounding society, which is a main goal of ESD, according to policy and theory. The results may provide useful recommendations for schools and ESD implementation programmes.

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