Education for Sustainable Development (ESD) in Sweden: A study of ESD within a transition affected by PISA reports

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Abstract:

Education for Sustainable Development (ESD) has been called for playing a crucial role in integrating principles, values, and practices accorded with sustainable development. Holistic approach, ethical values, norm transition and behavior changes are required to achieve the aim of ESD. However, while both external and internal impacts of the Swedish education system have affected its fundamental values and aims, core elements of ESD in Swedish curriculum were also influenced. This paper analyzes, in particular, the changes that PISA reports brought in the Swedish curriculum at the discourse level, and its potential effects on ESD. Discourse analysis was mainly used for comparing two curricula and two syllabi. With the help of situational contexts of PISA and the curriculum of 2011, a transition observed from text analysis was interpreted and the final discussion was anchored with social contexts from educational discourses. The result indicated that influences from PISA in the new curriculum and syllabus were observed in corresponded aims and goals. Situational and social contexts also pointed to the same direction of transition due to the previous goals-oriented curriculum that made a wide range of teaching. Thus, fundamental values, aims and goals were changed into providing clearer guidelines for teaching scope and gradings as well as into focusing literacy skills and knowledge of concepts. In the process of the transition, holistic approach, ethical and democratical values, as well as focus on cultural aspects and pupils’ attributes were removed or shrunken, which implied negative impacts on ESD. On the other hand, emphasis on literacy skills of students in the new curriculum was expected to bring positive achievement for ESD. Furthermore, in order to achieve the norm transition toward sustainable development, those lost immeasurable values are suggested to be addressed in future Swedish education.

Keywords: Sustainable Development, Education for Sustainable development, Discourse analysis, PISA reports, Curriculum comparison, Norm transition
Summary:

Despite of growing issues on sustainable development, discrepancy of information and actions has caused a repetition in sustainability problems of social, economic and environmental sectors. Education for sustainable development (ESD) has been brought up as a core suggestion in order to integrate practices, principles and values accorded with sustainable development. To achieve the purpose of ESD, holistic approach over the boundaries between environmental, social and economic sectors is necessary. In addition, ethical values constitute a fundamental basis of ESD and educational factors to link with motivating actions are regarded as essential elements to achieve ESD. However, both external and internal impacts of Swedish society have flowed into Swedish education. In particular, influence of growing concerns about PISA reports was recognized. To examine the changes influenced and potential impacts on ESD in Swedish education was aimed in this study. Discourse analysis on two curricula for compulsory schools from 1994 and 2011, and syllabi from 2000 and 2011 were mainly used for the study. Changes observed from text analysis were interpreted with situational and social contexts of the corresponded period. From the analysis, discourses on the need of new curriculum explained the transition of the curricula and syllabi. Since Sweden’s international rankings from PISA reports assessing literacy in reading, mathematics and science have declined during a decade, concerns about pupils’ learning outcomes have been increased in Sweden. In addition, problems in the previous curriculum and syllabus, such as goals-oriented and unclear guidelines were pointed out in that period. These contexts became coupled with dominant ideas of outcome focused and effectiveness in teaching and grading. In the course of the transition of thoughts, fundamental focuses such as democratic and ethical values, pupils’ pleasure and creativity, cultural aspects, and holistic views in the previous curriculum were removed or shrunken, which are crucial elements for ESD. On the other hand, emphasis on skills of literacy, concepts, and situations in the 2011’s corresponded to the test items of PISA were expected to bring positive influence on ESD in terms of the skills of expressing students’ own opinions. Furthermore, in order to achieve the norm transition toward sustainable development, those lost immeasurable values in the 2011’s are suggested to be addressed in future Swedish education, since values and pupils’ attributes can play role of motivating actions and suggesting a direction toward sustainable development.

Keywords: Sustainable Development, Education for Sustainable development, Discourse analysis, PISA reports, Curriculum comparison, Norm transition
List of acronyms

CDA  Critical discourse analysis
EE  Environmental education
ESD  Education for sustainable development
OECD  Organization for Economic Co-operation and Development
PISA  Programme for International Student Assessment
SD  Sustainable development
SR  Self-regulation
TIMSS  Trends in International Mathematics and Science Study
UN  United Nations
UNESCO  United Nations Educational, Scientific and Cultural Organization

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1. Introduction

How much can we remember of what we learned from compulsory schools and upper-secondary schools? If there are some things that we can come up with now, what kind of learning processes had we been through and how they have been internalized? These can be the main questions of education over time as well as the core tasks to deal with in every education. Since internalization of knowledge is, in other words, actualization of values which is beyond the level of understanding, it is harder but more important to achieve than just acquiring knowledge. This is the main reason that education called for education to realize sustainable development. The theme of sustainable development has been discussed in earnest since 1987 when the Bruntland Report was published by the World Commission on Environment and Development. In the report, sustainable development is defined as “a development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987, p. 27). To deal with sustainability issues such as usage of natural resources, democracy, and economic activities in the long-term perspective, the role of present generations is crucial as the definition indicated. To elicit extensive change from the present society in the world, what is needed is not only relevant information, but also actions and values within new norms. Education for sustainable development (ESD) comes to be different from environmental education (EE) at this point.

The 1992 UNCED(United Nation Conference on Environment and Development) report stressed that education is vital for promoting sustainable development and for enabling people to address environmental and social issues critically (UNCED, 1992). Accordingly, the United Nations Decade of Education for Sustainable Development (ESD) was declared for integrating the principles, practices and values of sustainable development into all of education. (German commission for UNESCO, 2011). It emphasizes that the ethical awareness, values, and attitudes accorded with sustainable development can be achieved by education. Compared to EE, not only is an environmental sector covered but also covered are social and economic sectors on the basis of ethical values in ESD. There is a reason why ESD is not “Education about Sustainable Development” but “Education for Sustainable Development.” As I questioned from the beginning, the ultimate goal of ESD also can be achieved only when actualization of values and internalization of knowledge are realized. Apart from that, since sustainable development covers an extensive scope of issues that are overlapped in several academic disciplines and over the border of countries, a fundamental task to interconnect different academic areas is in ESD. For instance, when it comes to the issue of reducing carbon dioxide, the political frictions between countries from the North and the South and economic issues between carbon trading and carbon taxing should not be separated but rather should be required to interconnect and cooperate together. In order to deal with this challenge, ESD is required to use holistic education which enables an interdisciplinary approach. Another characteristic of ESD comes from the challenge to reduce a gap of awareness and actions throughout countries. This is caused by countries’ different situations in politics, economics, and the environment. For instance, for those who have not experienced the climate crisis even though they “knew” and heard, it is difficult to feel immediate fear of environmental destruction, which results for them in a lack of motivation to take action. In addition, those exposed to the fearful crisis are mostly residing in weak countries either politically or economically, which causes the issue to be more complicated. Not only that, but the contrast in values regarding capitalism/materialism and spiritualism brings another reason for the gap between knowledge and actions. For instance, multinational companies from rich countries would still commit abuse of cheap child labor, overuse of water, and the destruction of nature in developing countries with the rationale of neo-liberal capitalism, even if they learned about sustainability in their education. Therefore, a transition of the fundamental thinking which can connect to action is another crucial task for ESD. Considering the characteristics of ESD that are different from EE, whether ESD is implemented and achieved in the right way or not is needs to be examined to prevent ESD and SD (Sustainable Development) from ending up as media rhetoric.

1.1. ESD in Sweden – History & Current situation

Sweden is the country that has a well-established welfare system with a strong economy and sustainable policies for the environment (The Swedish Ministry of The Environment, 2004). Since the UN(United Nations) conference on human environment in Stockholm in 1972, the government of Sweden has implemented a sustainable development strategy into all its policies. It stated that sustainable development has to be incorporated with all the curricula and teacher education because values and outlook on life are matters of a sustainable development vision (The Swedish Ministry of The Environment, 2004). The Swedish curriculum also stated that “teaching should illuminate how the functions of society and our way of living and working can best be adapted to create conditions for sustainable development” (The Swedish National Agency for Education, 1994, p. 6). Additionally, a variety of encouragement has been implemented; for instance, scholarships, diplomas,
and awards. Thus, the whole range of educational institutions from preschool to adult education has been motivated, and relevant organizations have also been kicked off; for instance, SWEDESD (Swedish International Center of Education for Sustainable Development), RCE centers (Regional Centre of Expertise) in Skåne and West Sweden, and CEMUS (Uppsala Center for Sustainable Development), etc. As efforts to study and research on ESD have increased, it has become widespread. However, what is not clearly understood is whether many efforts toward ESD are successful, in terms of people’s internalization as daily behaviors, and the difference between environmental education and ESD.

Particularly, the national curriculum for compulsory/upper-secondary school is hardly examined in terms of the question I presented in the beginning: has ESD achieved the goal for students to remember and actualize toward SD in their daily lives? According to the interview with Ulf Paul Lundgren, a professor in education at Uppsala University, Sweden has put bildung which means “God’s picture” as the final picture of the curriculum to show where students need to go and what they need to achieve as their goals, but currently they seem to lose their “pictures” due to the growing concerns for international assessments such as PISA (Programme for International Student Assessment) reports. Since international assessments indicate the world’s ranking of education in several subjects, the impact of this report has grown enough to affect the previous policy direction in many countries such as Sweden, Germany, Austria, Korea, Hungary, and so on (Breakspear, 2012, p. 15). This change of ultimate educational value is pointed out as one of the main threats that may weaken invisible values such as sustainability in educational areas (Lundgren, 2013).

1.2. Aim of Study

Even if there were an increase in attention on Sustainable Development in schools, it is another matter whether or not students internalize the knowledge to put into practice. Based on the increasing concerns on learning outcome, what supports the core aspects constituting ESD of Sweden could have been lost. Thus, the aim of this paper is to examine the change of Swedish education and its relation to Education for Sustainable Development. The research questions are as follows.

a) Have concerns about PISA results led to an increasing focus on improving such results in Swedish education?

b) If this has taken place, what can be possible impacts to ESD?

The outline of this paper is formed in following ways. Chapter 2, Theoretical perspectives, is followed by this introduction, chapter 1. The methods, chapter 3, explain the way of analyzing following three sections of analysis. Chapter 4 consists of analyses and is outlined to three sections: ‘situational contexts’, ‘curricula and syllabi analysis’ and ‘interpretation with social contexts’. In the chapter 5 of conclusion, concluding reflections and suggestions will be stated.

2. Theoretical backgrounds

2.1. Education for Sustainable Development

The differences between ESD and EE are described in short from the introductory part. The following part will specify how definitions of ESD have been used and which theoretical perspectives are inherent. A profound understanding of the core values and characteristics of ESD will aid further discussions and interpretations in the analysis part.

2.1.1. Holistic approach

As mentioned before, UNESCO (United Nations Educational, Scientific and Cultural Organization) declared the UN Decade of Education for Sustainable Development (2005–2014) in order to promote education as a decisive factor for change (German commission for UNESCO, 2011). The change here can be understood by the definition of SD. Although the “sustainable development” is broad and ununified, it is widely accepted that SD
needs the convergence of three pillars: economic development, social development, and environmental protection. The Brundtland report mentioned three key objectives for sustainable futures in a corresponding way: resource-efficient economy, quality of life, and healthy natural environment (World Commission on Environment and Development, 1987). In other definitions by international organizations, those three pillars are also pointed out despite a different wording. The World Conservation Union defines sustainable development as adopting lifestyles and developing paths within nature’s limits (IUCN, UNEP, WWF, 1991). Here it emphasizes people’s sharing with others and their care for the earth. United Nations Environment Program (UNEP) also defines sustainable development as “development which improves people’s quality of life, within the carrying capacity of earth’s life support systems” (IUCN, UNEP, WWF, 1991). From the definitions of SD, it can be recognized that SD is achieved by a holistic approach and interdisciplinary efforts from the three pillars to adapt our lifestyles within Earth’s capacity amidst ethical efforts.

Holistic approach is regarded as important for ESD with following reasons: first, ESD is required to cover the diverse, key issues of SD such as poverty alleviation, democracy, human rights, cultural diversity, patterns of consumption and productions, corporate social responsibility (CSR), and so on. (Sollart, 2005; UNESCO, 2009; UNESCO, 2003) To integrate these issues into education, relevant academic subjects such as economics, social science, politics, business, and ethics should be interlinked in teaching and learning. Second, ESD covers not only knowledge regarding the issues but also values. Integrating values and knowledge in education needs a different approach from subjects-focused education. It requires dealing with values such as social equity, peace, and democracy as well as knowledge: those values are related to ethics motivating peoples’ decision making and behavior. In a society, individuals and groups are divided by choosing values, and ethics which take a role in encouraging people to think about the crucial values involved in their choices. (Cox, et al., 2010) Taken into the contexts of SD, ethics and values such as equity and peace are decisive to make people to decide their behavior when they confront situations related to the patterns of consumption and production; cultural diversity, and so on. Thus, holistic approach to integrate values and ethics into the knowledge education is regarded as a core aspect for ESD. (UNESCO, 2006) John P Miller was the one who first used the term “holistic” in educational contexts. Miller said in his book, “Holistic Curriculum”, holistic education focuses on relationships---the world view of the holistic education is that everything is interconnected. The relationships in holistic education include the relationship between individual and community; the relationship to the nature; the relationship between self and self (Miller, 1996). The John’s holistic education theory explains why the holistic approach contributes to enable students to link themselves with sustainability issues. To consider human as a part of the earth can be an initial step for pupils to solve those interlinked issues and addressing their values and ethics to take actions. Therefore holistic approach can be regarded as a crucial indicator of ESD views for the analysis of educational discourses in this paper.

2.1.2. Ethical attitudes

When it comes to ethics of ESD, the extent of ethical attitudes to nature diverges between weak sustainability and strong sustainability. Weak sustainability and strong sustainability are defined by Colin Williams and Andrew Millington in their article “The diverse and contested meaning of sustainable development”. Weak sustainability is associated with a human-centered worldview and a growth-oriented approach in terms of economic development. Thus it focuses more on resources out of nature without requiring people’s behavior change. (Williams & Millington, 2004) When anthropocentrism is more stressed in terms of SD, nature’s instrumental value as “resources” is more emphasized (Svennbeck, 2004). Then, the aspect of development becomes more important even though “sustainable” is pursued in the three pillars. Compared to weak sustainability, the intrinsic value of nature is more associated with strong sustainability. From this perspective, economic activity is only a part of social development and, social development is limited by the boundary of biosphere (SANZ, 2009).
Different attitudes towards nature in terms of ethics can be indicated by narrative and wording. In the study by Margareta Svenbeck, ‘I-Thou’ relation, ‘I-It’ attitude, and ‘care-sensitive’ ethics are explained. ‘I-Thou’ and ‘I-It’, which are introduced by Martin Buber, create two ways to relate to the world. ‘I-Thou’ signifies ‘relation’, ‘meeting’, ‘mutuality’, and ‘reciprocity’, while ‘I-It’ is created by the attitude with the purpose of ‘knowing’ and ‘using’ between separated subject and object (Svennbeck, 2004). When it comes to the relation of nature and humans, these can connect to weak/strong sustainability. If a society accepts a relationship between nature and human as a part of nature and its reciprocity, there would be intrinsic value in nature with strong sustainability in the society. On the other hand, if efforts at sustainable development are limited to passive actions with business-as-usual in a society, there would be a high possibility to present relationships between nature and humans as an ‘I-It’ attitude that differentiates between inherent values of nature and humans. In this sense, humans would have a right to conquer nature with the purpose of utilization. Similarly, a ‘care’ attitude corresponds to ‘I-Thou’ and ‘conquer and control’ attitude to ‘I-It’ in the ‘care-sensitive’ ethics introduced by Karen Warren. From the perspective of ‘care-sensitive’ ethics, nature is considered morally without any condition, as we love the child unconditionally (Svennbeck, 2004). This view also puts intrinsic value on nature, which enables the larger boundary of the ecosphere with stronger sustainability than a human’s sphere. Two different ethical attitudes will be used for an analysis tool in this paper since it fits the aim of this study to examine the educational change in terms of ESD. Comparison of narrative and wording in educational discourses will reveal a transition of ethical attitudes to nature within the range of weak-strong sustainability.

2.2. Norm transition with behavior change

Environmental problems are a result of the interaction between humans and nature. How humans and nature interact is dependent on norms and values that different people have. Therefore, conflicts in different norms and values cause “environmental issues” in a society. When people who values clean water in their daily routines would try to discharge less wastewater, people who put more values on profits would discharge wastewater as much as they can. However, since the amount of clean water is limited in a society, this discordance of values can cause conflicts between them as well as environmental issues on water usage. Another instance can be happened in a society which has a weak sustainability norm. In this society, an NGO (Non-Governmental Organization) which is based on strong sustainability would call for a policy change regarding restrictions of emitting pollutions against the society. Moreover, it could become a global-wide environmental issue as well. In order to deal with such environmental issues that are caused by conflicts of different norms, a change of norms is necessary across the border of three pillars: biosphere, sociosphere, and econosphere. According to Per Wickenberg and Ulf Leo in Sociology of Law at Lund University, norm means “action directive” or “action direction”. Wickenberg and Leo explains the transition of norms performed at three levels; “knowledge” (cognition), “driving force” (will and ethical values, emotions), and “real possibilities” (systemic conditions). (Wickenberg & Leo, 2009) This implies that knowledge, driving force and real possibilities need to be examined when educational discourses are analyzed in terms of a transition of norm. When we apply this into the educational context, “knowledge” corresponds to what to transmit as a learning content through classes. “Driving force” corresponds to ethical values in education. “Real possibilities” can be referred as systemic conditions such as an education law, an ordinance, social norms, and political context, etc. Thus, depending on which norms are dominant in knowledge, ethical values and systemic condition, students can think and understand in different ways as well as can have different logics of perception and moral awareness, which are decisive in future action and decision making. Based on this, the relation of three dimensions will be used in the
analysis part of this paper, since norm as “action direction” can indicate a direction where education moves forward and how students put into practice.

Speaking of action directives, values itself are one of the influential factors which closely relate to actions. Depending on which value a student has, for instance between strong sustainability and weak sustainability, the frequency and the extent to commit sustainability actions will show definite differences. According to Edward S. Reed, “values stand for a pattern of regulation that are entered and incorporated into people’s thoughts and actions in a given environment” (Reed, 1996, pp. 1-2). However, behavior change does not always directly flow from values change (Arbuthnott, 2008). Without long-term motivation, it is very effortful to change behaviors. A study by Katherine D. Arbuthnott introduces the factors that are associated with intention and behavior. They are categorized into three: “attitudes,” “context,” and “individual attributes.” “Attitudes” contain intention specificity and perceived control. It is said that when intentions are more specific and personal, there is higher possibility to influence behavior. “Perceived control” here is referred as the belief of that individual actions can bring the change (Arbuthnott, 2008). Applying to this to ESD, when intention becomes more personal and educational activities give strong beliefs to accomplish sustainable development by individuals’ actions, the educational activities will be successful in terms of motivating students’ action. Contextual factors are also influential in terms of actualization. It is explained that when barriers such as inconvenience and cost exist as an ecological choice, it is not easy to actualize their ethical values (Arbuthnott, 2008). Conversely, when regulation exists to make irresponsible behavior toward nature difficult, the possibility for people to change behavior would grow. Personal attributes also cannot be ignored, according to Arbuthnott, as a strong influential factor when it comes to the relation between intention and behavior. For instance, habits as an unconscious factor affect our behavior without self-awareness, which is powerful because it dominates the individual’s day-to-day life.

Another interesting factor in personal resources is also introduced: self-regulation (SR) depletion (Arbuthnott, 2008). SR depletion is observed when the exercise of self-control depletes a cognitive resource. In the state of SR depletion, people tend to behave conversely to what they intend (Schmeichel, 2004). Considering the habit of students and the state of SR depletion in educational activities, they could give more inspiration to their actualization of sustainability values. Since these factors are relevant with behavior change and inspiration of students’ values and intentions in a long-term, factors studied here seem to fit into the aim of this paper. In order to find out whether ESD has an higher possibility of motivating students to internalize knowledge and values, “attitude,” “context,” and “individual attributes” will be used as indicators in the analysis of educational discourses in this paper.

2.3. Social influence theory

The study of this paper is initiated mainly based on the perspective that education and society are influenced each other. Dewey in his essay, “Education and Social change” stated about the relationship between education and society. He supported the view of changing society which is reflected by education as well as is guided by education. (Dewey, 2011) However, few studies in the field of education discuss about how society influence education, while how education influence society has been emphasized. (Ashdjian, 2012) In order to study the effects of PISA on the education, how social contexts affect education is needed to be focused. Therefore, Herbert C. Kelman’s social influence theory is adapted to the theoretical background of this study. His theory mainly deals with group and individual, how individual is influenced by belonging groups. When individual is asked to do some tasks, she/he tends to make efforts to accord with what a group expects, since individual hopes to achieve a favorable response from the other people. (Kelman, 1961) He explained the process of social influence in three processes; compliance, identification, and internalization. Compliance is happened when individual satisfies and accepts the influence from other people, and identification is occurred when the individual adopts others’ behavior which is associated with a self-definition in the group. Internalization is, finally, occurred when the induced behavior is consonant with individual’s value system. (Kelman, 1961) Applied to the aim of this study, it will explain why social contexts are influential on education. Social norms and customs, which are intertwined with dominant discourses of a society, cannot be separated from changing focuses of educations. Especially, when there are needs of new education in a society, teachers and policymakers may comply with the expected behavior with their professional identities. It also can interpret the role of a curriculum. A curriculum can be seen as a product of individuals who may be influenced by dominant social contexts. Also, since the curriculum is the product by an expert group of the national authority, providing guidelines are influential for teachers who hope to meet their expected needs of their schools, students and societies. Based on these, analyses and discussions of this paper will be interpreted in order to support to explaining the influence of society on education.
3. Methods

In this chapter, research designs and methods used in this study will be specified. The research designs and selected methods are aiming at answering the research questions of this paper: a) Have concerns about PISA results led to an increasing focus on improving such results in Swedish education? and b) If this has taken place, how has this affected ESD?

The primary method in this study is discourse analysis which is tailored due to the time constraint and the language proficiency not enough to carry out in-depth level of language analysis. Main materials of the analysis are curriculum documents. Curriculum documents for compulsory schools published in 1994 and 2011 by the Swedish National Agency for Education are chosen in order to find out a transition that were influenced by PISA reports. The time gap is determined to compare the documents before and after the PISA study could have influenced. The PISA study was launched in 1997 and the first document was published in 2000. Thus, the time period from 1994 to 2011. Regarding the educational level, since the PISA study assesses students at age 15, it corresponds to compulsory school students, which decides the compulsory school’s curriculum documents for this study.

A curriculum document in general is outlined in a curriculum part and a syllabus part. The curriculum part includes educational philosophy and aims based on the education act. It gives basic guidelines about what to teach and focus on in classes. Therefore, students in school are affected by the national curriculum in a way of forming their attitudes and behaviors. This is why curricula are chosen to be analyzed. First, we can determine which ideological ideas or aims have been conveyed and changed by the analysis of curricula. Second, we can investigate how this change can be interpreted in terms of ESD. However, the analysis of a curriculum only can give a broad picture since it provides holistic goals and basic guidelines. Furthermore, the ultimate and idealistic goal of education is almost unchangeable. For this reason, the syllabi are also analyzed. In the syllabus analysis, syllabi from the curriculum of 2011 and 2000 are used due to the unavailability of international version of the 1994 syllabus. The curriculum released in 2000 is the revised version of the 1994 curriculum that included the syllabus. Thus, the 2000 syllabus following the goals and directions of the 1994 curriculum is valid for comparison with the syllabus of 2011. Additionally, the year 2000, when the first PISA report was published, is still meaningful to be compared with in terms of discourses after influences of the PISA report.

To make the analysis fit into the aim of this paper, three subjects in syllabi part are chosen; Swedish, Mathematics and Natural Science. The choice is based on the three domains of the PISA assessment; reading, mathematical and scientific literacy. Since two syllabi are constructed in very different ways, certain categories are selected. On the other hand, the two curricula are studied with a standard way due to the similarity in format. For syllabi analysis, first, aims of each subject with category titles of “Goals to aim for” in year 2000 and “aim” in the year 2011 are studied. Under these categories, ultimate goals of each subject are described to give general direction where students are expected to arrive at. To provide specific guidelines of subjects, two syllabi contain sections titled “goals for pupils should have attained by the end of the ninth year in school” in the 2000 syllabus and “the knowledge requirements at the end of the year 9 in the 2011 syllabus. These goals in both sections are introduced as final goals for each subject what students need to achieve when they have completed compulsory education. In addition, since the year 9 is also corresponded to 15-year-old students in general, these categories match the scope of study. Then, there is one category respectively left in both syllabi that is not corresponded to each other. They are “structure and the nature of the subject” in the 2000 syllabus and “core contents” in the 2011 syllabus. Although we cannot compare text by text for these two categories, what interests are served by two categories and why the former one is omitted and the latter one is added in the 2011 syllabus can be studied through the analysis of their contents.

Because documents are the main materials and the comparison of texts is necessary for the aim of this study, discourse analysis is chosen as a primary method. In general, discourse analysis is used for revealing the motivation and politics in social situations, and it can be applied to all kinds of text. Thus, the formats of the discourse analysis vary and need modification depending on the aims of research and types of discourses (Frohmann, 1992). Critical discourse analysis (CDA) is chosen in this paper since CDA aims at understanding

1 “Curriculum” refers also to the whole document that covers curriculum and syllabus parts. Thus, the researcher uses “curriculum document” to indicate the broader definition and “a curriculum part” to indicate the narrow meaning in the case of contexts where the two concepts seem to be confused.
discourses in relation to power (Fairclough, 1992), which fits with the aim of this paper to examine influences from the external impact. In addition, CDA contains three levels of analyses: text analysis, processing analysis, and social analysis. Text analysis deals with vocabulary and grammar by focusing on lexical meaning, active/passive voice, focus of information, thematic structure, etc. Processing analysis focuses on producing and receiving contexts around the discourses. In this process, situational contexts, including dates and places that discourses were published, are interpreted. Social analysis is to explain the social and historical conditions that govern the discourse, such as why this voice is focused or negated in which situations (Fairclough, 1992). Thus, Fairclough’s three-level discourse analysis is useful to examine the systemic link between texts, situational contexts, and social contexts of discourse materials. However, not every material needs all three dimensions of analysis, according to her. As mentioned above, certain emphases can be chosen depending on the aim of analysis and the type of materials. For the case of this study, specific information for the process of users’ receiving was difficult and complicated to obtain. Even though extensive answers can be gathered, the perception from PISA and ESD may be unclear and vague, so that students and teachers could give answers which do not connect to the purpose of this study. For this reason, the processing analysis is tailored, making use of literatures regarding situational contexts. Comparison of both curricula and syllabi by text analysis will be performed in the analysis part of this paper for the purpose of examining the change influenced by PISA reports and the relation with ESD based on the theoretical framework and background information. Later on, an interpretation of the analysis with social contexts by means of articles and two interviews which illustrate personal opinions on the influences and their perception of PISA and ESD will be discussed. This part will assist to explain the social contexts and their relation with text and processing analyses of curricula and syllabi.

Articles that assist social analysis are written by educational scholars and the Swedish National Agency for Education (Skolverket) and the selection was arbitrary by topics relating to concerns about PISA reports. For the interview, two teachers participated, so that the discussion is to be enriched with the real voices from personal experiences. Both of them teach natural sciences, which is one of the main parts of the PISA report. One teacher works in a public secondary school located in a suburban area and the other teacher works in a private upper secondary school, which is located in a city center. A variety of backgrounds and levels of education are intended for impartial interpretation of personal opinions.

3.1. Limitation

In terms of research sources, due to the fact that most of information is written in Swedish, this research is limited in providing comprehensive analysis involving the use of diverse literature. Articles to be analyzed are also limited due to unfamiliarity with the language, but fortunately, several English documents related to the concerns about international assessments are available on the Web site of the Swedish National Agency for Education. For the same reason, while the curriculum time gap is two decades, the two syllabi have a one-decade time gap in this paper’s analysis. However, the syllabus from 2000 is integrated in the modified version of the curriculum from 1994; other goals and aims corresponded to the previous one. Additionally, the number of interviewees is rather small, which is not to provide comprehensive social contexts, but to hear the responses of teachers and aid to illustrate the interpretation with other social contexts in reference to their field experiences with regard to current educational focuses, directions, and concerns.

In general, the methodology of discourse analysis is not to provide definite answers but an insight and critical thoughts to social situations by unveiling of motivation or hidden politics. Hence, this study is hoped to contribute to facilitation of continuous reviews on influences by PISA reports and current educational direction in Sweden in order to develop a better environment for sustainable development.

4. Analysis

The analysis is divided into three parts: situational contexts; curricula and syllabi comparison and analysis; interpretation with social contexts. Situational contexts are based on a literature review in regards to a producing process and backgrounds of PISA reports and curriculum reform. Particularly, background information about PISA reports will give not only situational contexts but also an analytical tool for curricula analysis in order to examine the influences from PISA reports. Text comparison and analysis of two curricula and of two syllabi will be based on this as well as ESD theoretical backgrounds. Interpretation with the situational contexts will also follow. The relation between situational contexts and results of analyses will be discussed with the social contexts in light of articles and interpreted with the interviews of two teachers in the last part of this analysis.
4.1. Situational Contexts

4.1.1. Backgrounds of PISA reports

PISA is an Organization for Economic Co-operation and Development Program for International Students Assessment, which compares the knowledge and skills in reading, mathematics, and science of 15-year-old students all around the world. It is performed every three years, initially created in 1997, and the first report was published in 2000 (OECD, 2003). Since then, 2003, 2006, 2009, and 2012 reports have been published until now. The most relevant report that can provide influential contexts of the curriculum of 2011 would be the report published in 2009. Thus, for this study, the result of PISA assessment from 2009 is reviewed in order to grasp the situational contexts of producing the 2011 curriculum.

The aims and expectations of PISA can explain the characteristics of the PISA reports. Through them, we can understand the aim it pursues, and by this, we can examine the changes of the curriculum for the analysis of this paper. Participating countries collaborate on the PISA reports through the expert group; by the collaborative process, the validity of PISA as an educational measurement is authorized internationally. Thus, the PISA report has an expectation for participants to take responsibility at a policy level, according to the PISA 2003 documents. The main aim of PISA is to prepare for the challenges of today’s societies for students who are approaching to complete their compulsory education by measuring how well they are ready (OECD, 2003). Three domains are assessed as mentioned above: reading, mathematics, and science literacy, and “within each domain, the framework defines the content that students need to acquire, the processes that need to be performed and the contexts in which knowledge and skills are applied” (OECD, 2003, pp. 10-11) They emphasize that “this is for assessing not only a mastery of the school curriculum but more for important knowledge and skills needed in adult life by examining understanding of concepts, the mastery of processes and the ability to function in various situations” (OECD, 2003, pp. 10-12) The test items are mixed with; multiple-choice items and items which require students to construct their own answers (OECD, 2003). Knowledge and skills that targeted students are expected to acquire are covered in the test items of each domain.

<table>
<thead>
<tr>
<th>Definition of Domains</th>
<th>Mathematical Literacy</th>
<th>Reading Literacy</th>
<th>Scientific Literacy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assessed items</strong></td>
<td><strong>Knowledge</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quantity, space and shape, change and relationships and uncertainty, numbers, algebra and geometry</td>
<td>Continuous texts, non-continuous texts, arrange of prose forms(narration, exposition and argumentation), a range of written material(applications, forms, advertisements)</td>
<td>Concepts of physics, chemistry, biological sciences and earth and space sciences</td>
</tr>
</tbody>
</table>

Mathematical Literacy: An individual’s capacity to identify and understand the role that mathematics plays in the world, to make well-founded judgments and to use and engage with mathematics in ways that meet the needs of that individual’s life as a constructive, concerned and reflective citizen.

Reading Literacy: An individual’s capacity to understand, use and reflect on written texts, in order to achieve one’s goals, to develop one’s knowledge and potential and to participate in society.

Scientific Literacy: The capacity to use scientific knowledge, to identify questions and to draw evidence-based conclusions in order to understand and help make decisions about the natural world and the changes made to it through human activity.
Process | Use of mathematical language, modeling and problem solving skills | Retrieving information, forming a broad general understanding of the text, interpreting, reflecting on its contents, form and features | Ability to acquire, interpret and act upon evidence.
1) Describing, explaining and predicting scientific phenomena
2) Understanding scientific investigation
3) Interpreting scientific evidence and conclusions

Situations | Personal, educational, public and scientific | Personal use, public use, occupational use, educational use | Science in life and health, science in earth and environment, and science in technology

Table 1. Analytical tool I : What are assessed in the three domains in PISA?

As we can see from three definitions of the domains, “literacy” of each domain corresponds to “capacity” of “understanding” of “use” of each domain. Considering that the lexical meaning, “literacy” is defined as ability to read and write (Oxford dictionaries, 2013)2. Here in the PISA reports, “literacy” is used with broader meaning than the lexical meaning. Since what indicates for reading and writing of mathematics and science could be ambiguous, “understanding” and “using” of knowledge and skills in mathematics and science are interpreted as “literacy” of both domains. To match the aim of PISA which is provided for students to prepare today’s societies, three definitions use the words—“citizen,” “society,” and “changes made to it through human activity”—that emphasize the relation with the world outside of schools. Under the assessed items listed in the table above, “knowledge,” “process,” and “situation” are categorized. “Situations” stands for the background statement where questions are described and “knowledge” and “Process” are directly linked to what they fundamentally want to ask. Under “knowledge”, main important concepts of each domain are listed. The “process” covers “problem solving skills,” “interpreting,” “understanding,” and “reflecting” of the domains’ contents. Compared to the lexical meaning of “knowledge”—facts, information, and skills or theoretical and practical understanding through experience or education (Oxford Dictionaries, 2013)— a narrow definition of “knowledge” that indicates facts and information is used here. The other definitions of knowledge seem to be covered by the items in the “process”. Additionally, the meaning of “literacy” that is mentioned above is also well reflected in the “process” part.

The assessment by PISA in 2009 was performed in 65 countries and economies; 34 OECD (Organisation for Economic Co-operation and Development) countries and 31 partner countries and economies (OECD, 2011). Compared to PISA 2003 that had 42 countries as participants (OECD, 2011), we can see the participation over the world has become enlarged significantly within six years. The rankings are presented in every domain by comparing with other participants. Sweden was ranked 19th out of 65, which was on the OECD average in the domain of reading. The ranking of performance comparison in mathematics placed 26th out of 65, which is also near the OECD average. Science performance of Sweden in PISA 2009 was ranked 29th out of 65, and this place was defined as “statistically significantly below the OECD average” in the report (OECD, 2011). In light of the results from 2009 PISA, the biggest concerns in Sweden would be science and the next would be mathematics. The rankings are comparable with the adjacent regions such as Finland, Estonia, Denmark, and Norway; their rankings were placed above the Sweden’s in all domains. In addition, the changes of the results between 2000 and 2009 showed that every domain’s result in Sweden has declined (OECD, 2011).

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2 Lexical meaning is used for this study referenced from online oxforddictionaries.( http://oxforddictionaries.com/)
4.1.2. Background of Curriculum 2011

When the need of curriculum change is recognized in Sweden, the government or the parliament submits the proposition of the idea. Then, the expert group is assigned to deal with the proposition and build up some proposals to the government. In the process of the decision, professional researchers and consulting groups provide knowledge and experiences to assist the final decisions (Lundgren, 2002 cited in Abraham, 2008). The draft version is distributed by the government and mass media to the public, local government, and schools. In the course of this process, individuals, educational institutions, trade unions, and political parties give comments and opinions until the final one is published as an official curriculum (Lindensjö & Lundgren, 2005 cited in Abraham, 2008). This process of curriculum reform seems very democratic since a variety of voices from the public could be embedded in it. However, the mainstream ideology in the period is likely to dominate mass opinions and proposal ideas. In the study by Ole Elgström and Mats Hellstenius about curriculum debates and policy chances (Elgström & Hellstenius, 2011), it was pointed out that “substantial curriculum changes take place when ideational structures change.” This implies that change of the ideational structures and change of a curriculum are mutually influential. They stated that in the early 1990s, progressivism dominated but there was a shift of general ideological structures in both society and education. The dominating school of thought, progressivism, was increasingly challenged by essentialism. Progressivism is related to the idea of the welfare state, participatory democracy, and activation of students, so it focuses on contemporary societal problems. This idea also emphasizes the integrated approach where the borders of subjects are regarded as unnecessary. Essentialism in education, on the other hand, emphasizes that teaching is only based on knowledge and evidence-based experiences. In line with this, the main task of teachers in the essentialism education is to make students understand the world as scientifically based. Contrary to progressivism, separated and clearly defined subjects with discipline and hierarchy are regarded as important (Elgström & Hellstenius, 2011).

As Ole and Mats pointed, this shift also can be observed in the proposition by the government in 2008. This bill is titled “Clearer goals and knowledge—New curricula for school”. The background information of the 2011 curriculum is contained here. It stressed the need of specific guidelines and knowledge in a curriculum. In 2006, the government assigned special investigators to look into how education can be strengthened and improved. As a result, this proposition was suggested. The intention of this idea was to raise the quality of education and to increase the skills of students, and it explained that Swedish schools can achieve better performance from evaluations by this new reform (Björklund, 2008). There was another reason for the reform. It was pointed out that since the current—in the year 2008—curriculum of 1994 gave unclear guidelines, more clarified goals and requirements were necessary so they could provide greater equality and progress in the assessment of pupils’ knowledge. It was also hoped to provide clear guidelines to teachers in order to evaluate the learning outcomes and to plan education by clarification of goals and requirements (Björklund, 2008). The syllabus was also pointed out that it needed to be more focused on subject-specific competencies. According to the proposition document, Umeå University, Tranas municipality, and Karlstad University opposed this point for the reason that previous syllabus in the curriculum of 1994 had room for enabling different interpretations, which gave teachers opportunities to reflect by themselves. However, this proposition also pointed out that might bring about inequality of education (Björklund, 2008). For this reason, “core contents” which expresses clarified educational contents were added for the new syllabus part, and it hoped to bring better quality and increase effectiveness. “Knowledge requirement” was also newly added for the same reason. In addition, a new grading scale was also introduced to encourage students to strive more and to give parents and students visible academic progresses (Björklund, 2008).

Overall, clarifying of previous curricula was fundamental in this proposition. While there were supporting opinions about goals-oriented curricula which had room to give their own reflection, more subject-oriented and specified guidelines were emphasized in the proposal of the new curriculum. Along with them, “core contents,” “knowledge requirement,” and “new grading scale” were introduced in the new curriculum. This implies that needs and wants for the specified curriculum were more dominant. It is stated that the main reasons for the wants and needs are to increase pupils’ achievement and to provide effectiveness and equality of education (Björklund, 2008); this indicates that the decrease in pupils’ educational performance had been regarded as a prioritized issue for consideration when the proposition was made.

4.2. Curricula and syllabi analysis

Based on the situational contexts and the background of PISA reports, curricula from 1994 and 2011, and syllabi from 2000 and 2011 are compared and analyzed. Since the focus of PISA assessment is “literacy”, evidences of
the new curriculum to be influenced by PISA can be the changes in vocabularies and thematic focuses that imply an emphasis of literacy. As we checked from the definition and items of domains in PISA reports in the section above, the literacy that is assessed in PISA means “individual’s” “capacity” to “use”, “understand”, “identify”, and “develop” the “knowledge” and “skills” in order to “meet the needs of” and “participate in” “today’s society”. Items for testing the literacy cover the “knowledge” of “concepts” and “processing skills” including “describing”, “explaining”, “understanding”, “interpreting”, “problem solving”, etc. Results of identified changes based on these will be interpreted from the ESD perspective. I make use of theoretical backgrounds of ESD for this analysis. The table below presents the key words and thematic focuses of ESD that were described in the section 2.1 and 2.2.

<table>
<thead>
<tr>
<th>Used Words and concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
</tr>
<tr>
<td>Ethical perspective</td>
</tr>
<tr>
<td>Strong sustainability</td>
</tr>
<tr>
<td>Weak sustainability</td>
</tr>
<tr>
<td>Behaviour change</td>
</tr>
</tbody>
</table>

Table 2. Analytical tool II: Key words and thematic focuses of ESD

4.2.1. Curriculum part

Curriculum documents contain “fundamental values and tasks of the school” and “goals and guidelines” in both curricula of 1994 and 2011. “Goals and guidelines” has eight sub-sections; “Norms and values”, “Knowledge”, “Responsibility and influence of pupils”, “School and home”, “Transition and cooperation”, “The school and the surrounding world”, “Assessment and grades”, and “Responsibility of the head teacher”. These two curricula parts are almost identical except several words and sentences. The biggest changes are observed in the “knowledge” part. Thus, “Norms and Values”, “School and home”, “Transition and cooperation”, “The school and the surrounding world” and “Responsibility of the head teacher” are excepted from the discussion of this paper due to the identical texts with a trivial difference in wording which did not bring any change of meaning.

Fundamental values

From the beginning of the “Fundamental values” in both curricula, their statements contain different focuses. In the part of the year 1994, it begins with:

*The Education Act (1985: 1100) stipulates that all school activity should be carried out in accordance with fundamental democratic values and that each and everyone working in the school should encourage respect for the intrinsic value of each person as well as for the environment we all share (Chapter 1, §2). (The Swedish National Agency for Education, 1994, p. 3)*

On the other hand in the part of the year 2011, it is changed into;

*The Education Act (2010:800) stipulates that education in the school system aims at pupils acquiring and developing knowledge and values. It should promote the development and learning of all pupils, and a lifelong desire to learn. (Skolverket, 2011, p. 9)*

The 1994’s fundamental value is stipulating “all school activity” in accordance with “fundamental democratic values”, but this is changed into “acquiring and developing knowledge and values” in the “school system” in the 2011’s. Additionally, on the one hand, “encouraging respect” for the “intrinsic value” of “each person” and for “the environment” is chosen as another fundamental value in the 1994’s, but on the other hand in the 2011’s, “promoting” of the “development and learning” of pupils are emphasized, which is in the line with “acquiring and developing” in the fundamental values, and “lifelong desire to learn” is also chosen for the fundamental
values. As can be seen, the new curriculum’s wording for this part is mainly with “developing”, “knowledge”, and “pupils”, which implies these words play important roles to transfer the curriculum’s fundamental values. It is observed that these words are in the line with the focus of PISA that stresses on “individual’s capacity” to “develop and acquire” of “knowledge and skills”.

From the ESD perspective, this change can be discussed with the fundamental values of ESD. As the background and theoretical perspectives of ESD emphasized, “fundamental democratic values” and “respect for the environment” are stressed in the fundamental values of the 1994’s as well. On the other hand, the 2011’s put focuses more on “knowledge and values” and “development and learning”. Although these aspects also can embrace the “fundamental democratic values” and “respect for the environment”, the focus is not on the specific values but on more general “knowledge and values” and “development and learning”. This can be said weaken values in the new curriculum were caused by the change of focus. However “lifelong desire to learn” stated in the 2011’s can be regarded as a value to make “holistic” and “interdisciplinary” approaches possible from the ESD perspective.

Goals and guidelines for knowledge

What is notable in the curricula parts is that the curriculum of 1994 divided “goals” into two subgoals in the “knowledge” section: “goals to strive toward” and “goals to be attained.” Other sections in the 1994’s and the curriculum of 2011 did not. As we can see the table below, the section on “goals to strive toward” focuses on the idealistic final goals, and “goals to be attained” presents the knowledge and skill requirements. As it is mentioned above, except for the section on “knowledge,” other subsections do not divide “goals” into two categories, instead identifying only “goals to strive towards.”

<table>
<thead>
<tr>
<th>1994</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goals to strive towards</td>
<td>Goals</td>
</tr>
<tr>
<td>• develop a sense of curiosity and the desire to learn,</td>
<td>• can use the Swedish language, both in speech and writing, in a rich and varied way,</td>
</tr>
<tr>
<td>• develop their own individual way of learning,</td>
<td>• can communicate in English, both in the spoken and written language, and also be given opportunities to communicate in some other foreign language in a functional way,</td>
</tr>
<tr>
<td>• feel a sense of security and learn to consider and show respect in their dealings with others,</td>
<td>• can use mathematical reasoning for further studies and in everyday life,</td>
</tr>
<tr>
<td>• learn to carry out research, learn and work independently and together with others,</td>
<td>• can use knowledge from scientific, technical, social science, humanistic and aesthetic areas of knowledge for further studies, in societal and everyday life,</td>
</tr>
<tr>
<td>• strengthen the habit of independently formulating standpoints based not only on knowledge but also on rational and ethical considerations,</td>
<td>• can solve problems and transform ideas into action in a creative way,</td>
</tr>
<tr>
<td>• acquire good knowledge in school subjects and subject areas, to develop themselves and prepare for the future,</td>
<td>• can learn, research, and work independently and together with others, and feel confident in their own ability,</td>
</tr>
<tr>
<td>• develop a rich and varied language and understand the importance of cultivating it,</td>
<td>• can make use of critical thinking and independently formulate standpoints based on knowledge and ethical considerations,</td>
</tr>
<tr>
<td>learn to communicate in foreign languages,</td>
<td>• has obtained knowledge about and an insight into the Swedish, Nordic and Western cultural heritage, and also</td>
</tr>
<tr>
<td>• learn to listen, discuss, reason and use</td>
<td></td>
</tr>
</tbody>
</table>
their knowledge as a tool to
– formulate and test assumptions as well as solve problems,
– reflect over experiences and
– critically examine and value statements and relationships and
• acquire sufficient knowledge and experience to be able to make well considered choices over further education and vocational orientation.

Goals to attain in the compulsory school
• have a mastery of Swedish and can actively listen and read as well as express ideas and thoughts in the spoken and written language,
• have a mastery of basic mathematical principles and can use these in everyday life,
• know and understand basic concepts and contexts within the natural sciences as well as within technical, social and humanistic areas of knowledge,
• have developed their ability to express themselves creatively and become more interested in participating in the range of cultural activities that society has to offer,
• are familiar with central parts of our Swedish, Nordic and Western cultural heritages,
• have knowledge about the national minorities” cultures, languages, religions and history,
• are able to develop and use their knowledge and experience in as many different forms of expression as possible covering language, pictures, music, drama and dance,
• have developed their understanding of other cultures,
• can communicate in speech and writing in English,
• know the basis for society”s laws and norms as well as their own rights and obligations in school and society,
• have knowledge about the interdependence of countries and

obtained basic knowledge of the Nordic languages,
• has obtained knowledge about the cultures, languages, religion and history of the national minorities (Jews, Romanies, indigenous Samis, Swedish and Tormedal Finns),
• can interact with other people based on knowledge of similarities and differences in living conditions, culture, language, religion and history,
• has obtained knowledge of society’s laws and norms, human rights and democratic values in school and in society,
• has obtained knowledge about the prerequisites for a good environment and sustainable development,
• has obtained knowledge about and an understanding of the importance of the individual”s own lifestyle and its impact on health, the environment and society,
• can use and understand many different forms of expression such as language, art, music, drama and dance, and also has developed an awareness of the range of culture existing in society,
• can use modern technology as a tool in the search for knowledge, communication, creativity and learning, and
• can make well-informed choices regarding further education and vocational orientation.
different parts of the world,
• know the requirements for a good environment and understand basic ecological contexts,
• have fundamental knowledge about what is necessary to maintain good health and also understand the importance of lifestyle for health and the environment,
• have knowledge about the media and their role and
• can use information technology as a tool in their search for knowledge and to develop their learning as well as
• acquire deeper knowledge within a number of individually chosen subject areas.


“Goals to attain” of 1994’s corresponds to “goals” of the 2011 curriculum in terms of items that are suggested as expected abilities and skills to be attained: such as command of foreign languages, communications, and history and the sciences, etc. Compared to these, “Goals to strive towards” in the 1994’s focuses on different aspects, for instance, “a sense of curiosity”, “the desire to learn”, “own individual way of learning”, “confidence”, “strengthen the habit”, and “reflect over experiences”. These goals point to students’ attributes. In addition, other goals such as “to consider and respect”, “work together”, “ethical considerations”, “prepare for the future”, “critically examine and value statements and relations” are related to the values of interaction. Despite the differences, there are also statements that emphasizes an ability and knowledge: “learning to carry out research”, “good knowledge in school subjects”, “develop a rich and varied language”, “learning to listen, discuss, reason and use their knowledge as a tool”, “solve problems”, “knowledge and experience for choices over further education”. Considering that this is a section for “knowledge”, “goals to strive towards” seems to cover a comprehensive meaning of “knowledge” in it. As we checked the lexical meaning of “knowledge” before, it is defined as facts, information and skills acquired through experience or education. The “knowledge” with the use of broadened meaning, embraces the pupils’ attributes such as “a sense of curiosity”, “confidence”, “habit” and “experiences” in the 1994’s. This implies that the 1994’s document aims to provide knowledge along with strong motivation to pupils, in light of the ESD theoretical backgrounds of this paper. In addition, “ethical consideration”, “consider and respect”, and “prepare for the future” in the 1994’s are also in the line with the definition words of describing ESD.

The order of listing items, vocabularies, voices and the focus of information are different in these parts. In the part of the 2011’s, three items with items of “goals to attain” in the 1994’s are listed as goals. Added three items are “can solve problems and transform ideas into action in a creative way”, “can learn, research and work independently and together with others, and feel confident in their own”, and “can make use of critical thinking and independently formulate standpoints based on knowledge and ethical considerations”. These three statements almost correspond to the several statements in “goals to strive toward” in the 1994’s, which implies that despite “goals to strive toward” are almost eliminated in the new version, the three goals are still being retained.

Applying the ESD perspective to the three items, “ethical consideration” and “ideas into action” seem to be closely related to achieving of ESD. Although value focused items in “goals to strive toward” were almost removed together with the category in the 2011’s, some goals related to ESD seem to still be regarded as important. Another added phrase observed in the 2011’s is “further studies”. It is used in both items: “use mathematical reasoning for further studies” and “use knowledge from scientific, technical, social science, humanistic and aesthetic areas of knowledge for further studies”. This seems that there is new stress on the aim
of reaching the requirements for further studies in mathematics and science subjects. It is possible that this change is influenced by the lower achievement of these subjects’ disciplines from evaluations when the new curriculum was produced. Considering that mathematics and sciences are referred in these two statements, the situational contexts of lower ratings of mathematics and science literacy in PISA reports over nine years could affect the new words added.

The listing order is changed at the items regarding cultural studies. Four items with “cultural activities”, “cultural heritages”, “minorities” cultures and history”, “understanding of other cultures” are posited in the fourth in the part of the 1994’s. However, they are moved into the eighth position as well as the number of the items is reduced into two in the 2011’s. In addition, “knowledge about the interdependence of countries and different parts of the world” and “knowledge about the media and their role” are omitted in the 2011’s. These two changes can also be reflected from the ESD perspective. Based on the theoretical backgrounds of ESD, the cultural aspects are related to the holistic approach and the core part of the social development which is one of the three pillars. Although this change of the order and the decrease in the number of statements cannot be regarded as a direct effect by PISA reports, it is a fact that other items get prioritized while they are dropped out in the process of producing the new curriculum. In light of the situational contexts of the new curriculum, decrease in pupils’ performance was mentioned as a primary background of suggesting the new curricula. (Björklund, 2008) Thus, it is possible that the cultural studies are regarded as comparatively less important when it comes to dealing with the decrease in students’ performance.

We can observe another change that the term of “sustainable development” is only used in the 2011’s. Instead of “sustainable development”, “basic ecological contexts” is used in the 1994’s. This change of words can be interpreted that the term of Sustainable development has been widely used and more emphasized than before. On the other hand, in terms of the connotation meaning, “ecological contexts” can be interpreted to imply strong sustainability which focuses ecological aspects more—social and economic development are limited within the boundary of ecological aspects. For this reason, it is hard to claim that which one is more associated with the realization of SD only from these two phrases.

4.2.2. Syllabus part

Compared to the two curricula in which the corresponded categorization is used, the syllabi parts of 2000 and of 2011 are constructed in rather different ways. When we look at the introduction part of the syllabus part in two versions, two different focuses of the syllabi are observed. From the beginning of 2000’s, it is stated that;

> All subjects should have common goals of imparting pleasure with creativity and creating a desire to continue learning in students. ... Fundamental values such as freedom and integrity of individuals and equality should be taught by subjects, integrated into the organization and the coordination of teaching as well.... cooperating across subjects is necessary for producing more meaningful development of knowledge (Skolverket, 2000)

The introduction of the 2011 syllabus states that;

> The syllabuses contain the aim of the subject and its core content. The syllabuses are introduced with the reasons for teaching the subject in different school forms. Thereafter the aim and the long-term goals of teaching in the subject are given. The core content states what should be covered in the teaching. The core content is designed to provide scope for teachers to go into greater depth or supplement the core content. The knowledge requirements define acceptable knowledge and the different grades. (Skolverket, 2011, p. 6)

As we can see, the 2000’s introduces the syllabus part along with goals and fundamental values. “Imparting pleasure” with “creativity” and “creating a desire to continue learning” are regarded as the goals for the syllabus. On the other hand, the part of the 2011’s describes in a different voice. The focus is put on explaining about the “core contents” and “knowledge requirements” as a tool for giving “teaching scope” in “different school forms”. It explains that the purpose of “core contents” is to give a “scope for teachers to go into greater depth”; the purpose of “knowledge requirements” is to give “definite acceptable knowledge and the different grades”.

They imply that the 2011 syllabus puts the focus on how to measure pupils’ knowledge and grade them. We could understand by linking with the situational contexts that there had been systemic efforts and needs to provide concrete guidelines for teaching and assessing pupils’ study results, according to the proposal for the
In light of the ESD analytical tool, values of motivating students’ attributes and attitudes are associated with leading of behavior change, as it is stressed in the 2000’s introduction. The line with this, “Freedom” and “integrity of individuals and equality” are referred as “the fundamental values” that “should be taught by subjects”, “the organization”, and “the coordination”. This sentence also seems to associate with the ESD perspective, since democratic values and ethical values such as “freedom”, “integrity” and “equality” are chosen as the fundamental focuses for the syllabus part. In addition, we can see “taught by subjects”, “the organization” and “the coordination”, which appear to indicate the norm transition. As described in the ESD theoretical backgrounds of this paper, not only knowledge but also driving forces such as emotion or ethical values and systemic conditions are the core parts for the norm transition toward ESD. Based on this, the mention of education that cooperated with the organization and the coordination can be regarded as recognition and high possibility of the norm transition in the 2000 syllabus.

Two syllabi are differently categorized. The syllabus of 2000 is divided into four categories for every subject: “aim of the subjects and their role in education,” “goals to aim for in the subject,” “the structure and nature of the subject,” and “goals that pupils should have attained by the end of the fifth/ninth year in school”. The syllabus of 2011, on the other hand, is divided into three parts: “aim,” “core contents,” and “knowledge requirements”. “Core contents” is divided into three parts again: the years between 1-3, 4-6 and between 7-9. “Knowledge requirements” is divided by two yearly requirements at first—the end of year 6 and of the year 9—and then divided again by different grading criteria, A, B, C, D, and E, respectively. As observed in the introduction parts of two syllabi, the focus of clear teaching scope as well as knowledge for improving pupils’ achievement would affect the change in the thematic structures of two syllabi.

We can see that the 2000’s contain aim and the roles of subject as well as goals to aim for, while the 2011’s states just aiming of subjects. This implies that the 2000’s tends to describe in goal-oriented and puts values on the role of the subject. This focus can be observed in “the structure and nature of the subject” as well. This part also explain the characteristic and knowledge about the subject with the philosophical voices. Specific skills and knowledge to be graded occupy only one categorization in the 2000’s, while they occupy two out of three categories in the 2011’s. By the categorization, we can see that the focus of 2000’s syllabus is putting on making pupils understand the values of the subject, while the 2011’s stresses more on knowledge and grading by new thematic structures with the “core contents” and “knowledge requirements”.

The comparison of texts is performed in the two pairs of categories; one pair is “Goals to aim for” of the 2000’s and “Aim” of the 2011’s. Another one is “goals that pupils should have attained by the end of the ninth year in school” and “Knowledge requirements at the end of the year 9”. Apart from the two pairs, the main contents of “Aim of the subject and its role in education” will be excerpted from the 2000’s for additional illustrating of the aims of the subject when “goals to aim for” and “aim” are compared. “The structure and nature of the subject” of the 2000’s and “Core contents” of the 2011’s will be discussed with their excerpts to identify different roles and reasons for the change at the last part of the syllabi analysis.

**Swedish Subject**

<table>
<thead>
<tr>
<th>2000</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aim of the subject and its role in education</td>
<td>Aim</td>
</tr>
<tr>
<td>- Provide opportunities to use and develop ability to speak, listen, see, read and write, as well as experience and learn from literature, films and the theatre.</td>
<td>- Develop their spoken and written language so that they feel confident in their language skills and can express themselves in different contexts and for different purposes</td>
</tr>
<tr>
<td>- Language and literature are of great importance in developing a sense of personal identity</td>
<td>- Develop their language or thinking, communication and learning</td>
</tr>
<tr>
<td>- Language occupies a key position in school work.</td>
<td>- Develop knowledge of how they can express their own views and thinking in different types of texts and through various media</td>
</tr>
<tr>
<td>- The written word is of immense importance and society imposes demands on the ability to cope with, assimilate and evaluate texts.</td>
<td>- Develop skills for creating and working on texts, individually and together with others</td>
</tr>
<tr>
<td>- Culture and language are inseparably connected with</td>
<td>- Express themselves through different forms of aesthetic expression</td>
</tr>
</tbody>
</table>
Goals to aim for

- Develop their imagination and desire to learn through reading literature, as well as reading on their own for personal enjoyment
- Develop their imagination and desire to create using language, both individually and in co-operation with others
- Develop correctness in their spoken and written language, and have the courage, desire and ability to express themselves in many different contexts, and by means of writing acquire an instrument for thinking, learning, communicating and exercising influence,
- Develop their ability to develop texts they have written based on their own critical reflection and advice from others,
- Develop their ability in a dialogue with others to express feelings and thoughts, arising from texts with a variety of purposes, as well as be stimulated into reflecting and evaluating these,
- Develop their ability to read, understand, interpret and experience texts of different kinds and adapt their reading and work on texts to its purpose and character
- Have the opportunity of understanding cultural diversity through exposure to literature and authors from different times and in different forms from Sweden, the Nordic area and other parts of the world
- Acquire a knowledge of the Swedish language, its ongoing development, structure, origins and history, as well as develop their understanding of why people write and speak differently
- By means of their own writing, deepen their insight into basic patterns and grammatical structures in the language, as well as develop their ability to apply the standards of written language in different contexts
- Gain experience of languages in the neighboring Nordic countries, as well as an orientation to the Sami language and other minority languages in Sweden,
- Develop their ability to write legibly and use computers as an aid
- Develop the ability to use different opportunities to obtain information, acquire knowledge of the language and functions of the media, as well as develop their ability to interpret, critically examine, and evaluate different sources and their contents
- Are encouraged to be personally creative and search on their own for meaningful reading, as well as take

- Develop knowledge of how to search for and critically evaluate information from various sources
- Acquire knowledge about literature from different periods and different parts of the world
- Develop knowledge of various forms of non-fiction
- Develop language, own identity and understanding of the surrounding world
- Develop knowledge of the Swedish language, its norms, structure, history and development, as well as how use of language is related to social contexts and media
- Strengthen awareness of and belief in their own language and communicative ability
- Obtain and understanding that the way in which we communicate has an impact on other people
- Take responsibility for their own use of language
- Meet and become familiar with both other Nordic languages and the national minority languages
- Express themselves and communicate in speech and writing
- Read and analyze literature other texts for different purposes
- Adapt language to different purposes, recipients and contexts
- Identify language structures an follow language norms
- Search or information from different sources, and evaluate these
part in cultural activities
· acquire an insight into their learning, and reflect over their own development, and learn both on their own and together with others to use their experiences, thinking and language skills to form and maintain their knowledge

Table 4. Aims of Swedish subject. Based on the Skolverket 2000, p. 81-82. and Skolverket 2011, p.211.

As we can see, “aim of the subject and its role in education” provides motivating pictures that enable pupils to address about the roles of learning Swedish subject in a society. For this reason, it has a different voice and focus compared to “goals to aim for” of the 2000’s and “aim” of the 2011’s.

Apart from the “aim of the subject and its role in education”, “goals to aim for” and “aim” show significant differences. In the 2000’s, individual’s emotion and attributes are aimed by wording such as “imagination”, “desire to learn”, “personal enjoyment”, and “reflecting over”. On the other hand, only “confidence in their language skills” and “developing own identity” are chosen as the aims regarding pupil’s attributes in the section from 2011’s. Compared to this, “Skills” and “knowledge” are emphasized more in the wording of 2011 Swedish syllabus. As we can see in this phrase again; “confidence in their language skills”, “skills” are regarded as conditions of “confidence”. For another instance, “developing knowledge of how they can express their own views and thinking in different types of texts”, “skills for creating and working on texts”, “expressing through different forms of aesthetic expression”, “how to search for and critically evaluate information”, “acquiring knowledge about literature from different periods and different parts of the world”, “knowledge of various forms of non-fiction”, and “knowledge of the Swedish language, its norms, structure”---which are listed as aims of 2011 Swedish syllabus---are all associated with skills and knowledge. Compared to this, the 2000’s mentions less about skills and knowledge, for instance; “develop correctness in their spoken and written language”, “ability to develop texts they have written”, “ability to read, understand, interpret and experience texts of different kinds”, “deepen the insight into basic patterns and grammatical structures” and “language skills to form and maintain their knowledge”.

There are almost few phrases corresponded in this comparison, which means the focus of aims in the Swedish subject was changed considerably. By the comparison of the educational curriculum change, as Ole and Mats said, the need for change in the ideational structures can be found. (Elgström & Hellstenius, 2011) Keeping this in mind, changed ideational structures can be observed, which underlie the discourses. Considering that PISA assessment aims at testing the literacy, literacy skills such as understanding, using, and reflecting texts are crucial in order to improve the reading literacy performance. When we count the number of “knowledge” and “skills”, “knowledge” is used in three times and “skills” is used once out of fourteen statements in the 2000’s. On the other hand, “knowledge” is used in five times and “skills” is used twice out of twelve statements. In the course of decreasing in the number of total statements while increasing in the number of “knowledge” and “skills”, cultural aspects are omitted for the 2011’s. In the 2000’s, cultural aspects are aimed with the phrases such as; “the opportunity of understanding cultural diversity through exposure”, “gaining experience of languages in the neighboring countries and other minority languages”, and “being encouraged to be personally creative and search on their own for meaningful reading, as well as take part in cultural activities”. However, they all are dropped out for the 2011’s. These changes observed in the 2011 Swedish syllabus can be regarded as being influenced by PISA reports due to the social contexts that performances of reading literacy had been decreased since 2000, and also the needs for better performance of pupils were dominant when the new curriculum produced. (OECD, 2011; Björklund, 2008)

Although Swedish subject can be regarded as being far from the sustainable development, the interdisciplinary and holistic approach or attitudes and values can be seen as indicators in light of the ESD perspective. For this reason, the cultural aspects with the phrases, “cultural diversity”, “participate in cultural activities”, in the 2000’s can be seen as room for integrating the domain of social development for ESD. In addition, pupils’ attributes are related to motivate their behavior, according to the theoretical backgrounds of this paper. For instance when “imagination and desire to create” are linked with “understanding cultural diversity” in the Swedish subject, Swedish class seems possibly to take ESD into its domain. On the other hand, in the 2011’s part, one item “develop language, own identity and understanding of the surrounding world” can be related to ESD. As pupils’ attributes and cultural aspects of Swedish are comparatively downgraded than before, possible area to integrate
values and ethics for realizing holistic education seems to be decreased.

Following are the final goals for Swedish that pupils should attain when the compulsory education is finished. Differently from the 2000’s, the 2011’s introduces knowledge requirements. It is divided by grading A, B, C, D, and E. Among different grades, the knowledge requirements for Grade A is chosen to be analyzed since Grade A can be the goals expected ultimately for the compulsory education. This is also applied to the analysis of other subjects. Bolding texts are original in the syllabus document of 2011.

<table>
<thead>
<tr>
<th>Goals that pupils should have attained by the end of the ninth year in school</th>
<th>Knowledge requirements at the end of the year 9 (Grade A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>· Be able to actively take part in conversations and discussion, as well as be able to share the thoughts of others, and be able to present work orally so that the contents are clear and understandable</td>
<td>Pupils can read fiction and non-fiction texts with very good ease by using and choosing reading strategies based on the specific characteristics of the text in an appropriate and effective way. By making well developed summaries of the contents of different texts with good connection to time aspects, causal relationships and other texts, pupils show very good reading comprehension. In addition, on the basis of their own experiences, different issues concerning life and the surrounding world, pupils can interpret and apply well developed and well informed reasoning about the explicit and implicit messages in different works.</td>
</tr>
<tr>
<td>· Be able to read literature appropriate to heritage from Sweden, the Nordic area, and other countries, and also read non-fiction and newspaper articles on general subjects, as well as be able to re-produce the contents coherently and also reflect over this</td>
<td>Pupils can also carry out well developed and balanced reasoning about the work and how it is related to its creator. Pupils then draw well informed conclusions on how the work has been affected by the historical and cultural context it emerged from.</td>
</tr>
<tr>
<td>· Be able to read, reflect over and put into a context some literary works and authors that have been influential in affecting how people live and think</td>
<td>Pupils can write different kinds of texts with good variation in language, well developed text linking and also well functioning adaptation to type of text, language norms and structures. The narrative texts pupils write contain well developed expressive descriptions and narrative devices and dramaturgical elements with complex structures. Pupils can search for, select and compile information from a varied range of sources and then apply well developed and well informed reasoning to the credibility and relevance of their sources and information. The summaries contain well developed and balanced descriptions and explanations, well developed topic-related language, and well functioning structures, quotations and source references. By combining different types of texts, aesthetic expressions and media so that the various parts interact in an appropriate and effective way, pupils can enhance and bring to life the message in their texts. In addition, pupils can make well developed and balanced assessments of the contents of a text and its structure, and based on responses work on enhancing clarity, quality and expressiveness in a well functioning way.</td>
</tr>
<tr>
<td>· Be able to appreciate and reflect over and evaluate the contents and means of expression used in pictures, films and the theatre</td>
<td>Pupils can talk about and discuss various topics by asking questions and expressing opinions with well developed and well informed arguments in a way that takes the dialogues and discussions forward and</td>
</tr>
<tr>
<td>· Be able to write different kinds of texts so that the contents are clear, and in doing this apply the standards of the written language, when writing by hand and using computers</td>
<td></td>
</tr>
<tr>
<td>· Have a knowledge of the language which makes it possible to carry out observations of both one’s own and others’ use of language</td>
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</tbody>
</table>
As we can see, the big difference between two final goals is the length of the contents. The final goals of the 2000’s are stated in a simple way, while goals in the 2011’s are stated in detail with the specified guidelines. In the 2000’s, the portions of mentioning for attitudes, skills, cultural aspects are quite in balance. Attitudes such as “actively participating in conversations and discussions”, “sharing the thoughts of others” are selected as the final goals for Swedish. Knowledge and skills for the final goals are “presenting work orally”, “writing different kinds of texts”, and “knowledge of the language”. The cultural aspect expressed with “reading heritage from different countries appropriately” is contained for the final goals as well.

Features of the final goals for the 2011’s seem to parallel with the aspects shown in the part for the aims of the 2011 Swedish syllabus. Knowledge and skills of reading and writing are dominant with phrases such as “making well developed summaries”, “show very good reading comprehension”, “drawing well informed conclusions”, “giving well developed oral accounts with well functioning structures and contents”, etc. To clarify the goal, they frequently use phrases such as “well developed” and “well functioning” almost in every single line. Overall, in terms of the focus of information and the voices, the extent of changes in this section observed in the new Swedish Syllabus seems to coincide with the one in the section for the aims.

**Mathematics Subject**

<table>
<thead>
<tr>
<th>2000</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aim of the subject and its role in education</strong></td>
<td><strong>Aim</strong></td>
</tr>
<tr>
<td>· to be able to make well-founded decisions when making different choices in everyday life</td>
<td>· Develop knowledge of mathematics and its use in everyday life an in different subject areas</td>
</tr>
<tr>
<td>· to be able to interpret and use the increasing flow of information</td>
<td>· Develop interests in mathematics and confidence in their own ability to use it in different contexts</td>
</tr>
<tr>
<td>· to be able to follow and participate in decision making processes in society</td>
<td>· Experience aesthetic values in mathematical patterns, forms and relationships</td>
</tr>
<tr>
<td>· provide a sound basis for studying other subjects, for further education and lifelong learning</td>
<td>· Develop knowledge in order to formulate and solve problems, and also reflect over nd evaluate selected strategies, methods, models and results.</td>
</tr>
<tr>
<td>· give an insight into the subject’s historical development, its importance and role in our society</td>
<td>·Develop knowledge to be able to interpret situations in daily life and mathematics, and also describe and formulate these by using mathematical forms of expression</td>
</tr>
<tr>
<td>· create opportunities for communicating in mathematical language and expressions</td>
<td>·Develop familiarity with basic mathematical concepts and methods, and</td>
</tr>
<tr>
<td>· discover aesthetic values in mathematical patterns, forms and relationships</td>
<td></td>
</tr>
<tr>
<td>· experience satisfaction and joy in understanding and solving problems</td>
<td></td>
</tr>
<tr>
<td>· practice and communicate mathematically in meaningful and relevant situations through actively and openly searching for understanding, new insights and solutions to different problems</td>
<td></td>
</tr>
<tr>
<td>Aim to ensure pupils to</td>
<td>Aims to develop numerical understanding and ability to understand and use</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| · Develop an interest in mathematics, as well as confidence in their own thinking and their own ability to learn and use mathematics in different situations  
· Appreciate the important role mathematics plays in different cultures and activities, and become familiar with historical contexts, where important concepts and methods in mathematics are developed and used  
· Appreciate the value of and use mathematical forms of expression  
· Develop their ability to understand, carry out and use logical reasoning, draw conclusions and generalize, as well as orally and in writing explain and provide the arguments for their thinking  
· Develop their ability to formulate, represent and solve problem with the help of mathematics, as well as interpret, compare and evaluate solutions in relation to the original problem situations  
· Develop their ability to use simple mathematical models, as well as critically examine the assumptions, limitations and uses of these models  
· Develop their ability to make use of pocket calculators and computers |
| · basic numerical concepts and calculations with real numbers, approximate values, proportionality and percentages  
· different methods and measuring systems and instruments to compare, estimate and determine the size of important orders of magnitude  
· basic geometrical concepts, properties, relations and propositions  
· basic statistical concepts and methods for collecting and processing data and for describing and comparing important properties of statistical information  
· basic algebraic concepts, expressions, formulae, equations, and inequalities,  
· properties of different functions and graphs  
· the concept of probability in concrete random situations  
· Develop knowledge in using digital technology to explore problems, make calculations and to present and interpret data  
· Develop ability to argue logically and apply mathematical reasoning  
· Develop familiarity with mathematical forms of expression and how these can be used to communicate about mathematics in daily life and mathematical contexts  
· Develop knowledge about historical contexts where important concepts and methods in mathematics have been developed  
· Reflect over the importance of mathematics, its use and limitations in daily life, in other school subjects and in historical processes, and as a result be able to see the context and relevance of mathematics  
· Formulate and solve problems using mathematics and assess selected strategies and methods  
· Use and analyze mathematical concepts and interrelationships  
· Choose and use appropriate mathematical methods  
· Apply and follow mathematical reasoning  
· Use mathematical forms of expression to discuss, reason, calculations and conclusions |


First of all, “Aim of the subject and its role in education” plays a role in giving idealistic aims and the roles of mathematics, as we could see in the Swedish subject syllabus. Thus, here it states beyond the specific skills and knowledge with the expressions such as “making different choices in everyday life”, “participate in decision making processes in society”, “provide a sound basis for studying their subjects”, “experience satisfaction and joy”, and so on. “Goals to aim for” of the 2000’s is structured with two categories; one for “aims to ensure pupils to” and another for “aims to develop numerical understanding and ability to understand and use”, while the syllabus of 2011 has no division for illustrating the aim. Apart from the categorization, “goals to aim for” of the 2000’s and “aim” of the 2011’s are quite corresponded each other in terms of the contents. For instance, identical phrases such as “Developing interests in mathematics and confidence”, “historical contexts” and knowledge
about “numerical concepts and methods” are observed in both of the syllabi.

Nevertheless, the reason for removing the categorization of “aims to ensure pupils to” and “aims to develop numerical understanding and ability to understand and use” can be considered as the sign of focus changing in the aims for mathematics. Considering that the former one covers attitudes and the relation with other cultural or historical contexts but the latter one mainly covers knowledge of concepts, the need for emphasizing those aims by another categorization would have been decreased when the 2011’s was made. By using one category, all aims can take equal extent of importance. In the meanwhile, “the important role in cultures and activities” is deleted but “interpret situations in daily life and mathematics and also describe and formulate these”, “to present and interpret data”, “develop familiarity with mathematical forms of expression and how these can be used to communicate about mathematics in daily life and mathematical contexts” are added in the 2011’s. These items are relevant with the “process of problem solving” and “literacy” skills, which have to do with PISA tests. Compared to the 2000’s, literacy skills related verbs such as ‘present’, ‘interpret’, ‘use’, ‘discuss’, ‘express’ are dominant in the 2011’s. These changes observed in the new curriculum seem to relate to the purpose of the new curriculum which were introduced in the proposition—providing clarifying guidelines for teachers in order for better achievement. In addition, the situational context of the decline in Swedish performance of mathematics literacy in PISA since 2000 aids to understand the clarification of aiming with stressing of mathematics literacy which was made in the process of new curriculum making.

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-Have developed their understanding of numbers to cover whole and rational numbers in fraction and decimal form,</td>
<td>Pupils can solve different problems in familiar situations in <strong>well</strong> functioning ways by choosing and applying strategies and methods with <strong>good</strong> adaptation to the type of problem, and also <strong>formulate</strong> simple mathematical models that can be applied in the context. Pupils apply <strong>well developed</strong> and <strong>well informed</strong> reasoning to their approaches and the plausibility of their results in relation to the problem situation, and can also make <strong>proposals</strong> on alternative approaches.</td>
</tr>
<tr>
<td></td>
<td>-have good skills in and be able to make estimates and calculations of natural numbers, numbers in decimal form, as well as percentages and proportions in their head, with the help of written calculation methods and technical aids,</td>
<td>Pupils have <strong>very good</strong> knowledge of mathematical concepts and show this by using them in <strong>new</strong> contexts in a <strong>well</strong> functioning way. Pupils can also describe different concepts using mathematical forms of expression in a <strong>well</strong> functioning way. In the descriptions, pupils can switch between different forms of expression and also apply <strong>well developed</strong> reasoning over how the concepts relate to each other.</td>
</tr>
<tr>
<td></td>
<td>-be able to use methods, measuring systems and instruments to compare, estimate and determine length, area, volume, angles, quantities, points in time and time differences,</td>
<td>Pupils can choose and use <strong>appropriate and effective</strong> mathematical methods with <strong>good</strong> adaptation to the context in order to make calculations and solve routine tasks in arithmetic, algebra, geometry, probability, statistics, and also relationships and change with <strong>very good</strong> results.</td>
</tr>
<tr>
<td></td>
<td>-be able to reproduce and describe important properties of some common geometrical objects, as well as be able to interpret and use drawings and maps,</td>
<td>Pupils can account for and discuss their approaches in an <strong>appropriate and effective</strong> way and use symbols, algebraic expressions, formulae, graphs, functions and other mathematical forms of expression with <strong>good</strong> adaptation to purpose and context. In their accounts and discussions, pupils apply and follow mathematical reasoning by putting forward and responding to mathematical arguments in a way which <strong>takes the reasoning forward and deepens or broadens them</strong>.</td>
</tr>
<tr>
<td></td>
<td>-be able to interpret, compile, analyse, and evaluate data in tables and diagrams,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-be able to use the concept of probability in simple random situations,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-be able to interpret and use simple formulate, solve simple equations, as well as be able to interpret and use graphs for functions describing real relationships and events.</td>
<td></td>
</tr>
</tbody>
</table>

In the final goals for mathematics, the items of goals and their wording in both syllabi do not show great differences, probably because of the characteristics of the subject, mathematics; that is mainly dominated by calculations, skills, and measurable methods. For this reason, it is difficult to find room to convey ESD through the mathematics particularly when evaluating pupils’ achievement.

In terms of the mathematics literacy, there are some changes observed that seem to associate with the assessed items of PISA. In the mathematics literacy, “knowledge” and “process” along with “situations” are used for questioning items in PISA. (OECD, 2003) Particularly in the 2011’s, we can observe “situations” frequently. “Solve different problems in familiar situations”, “formulate simple mathematical models that can be applied in the context”, “the plausibility of their results in relation to the problem situation”, and “good adaptation to the context” are chosen as final goals of the 2011 mathematics syllabus. These goals seem to accord with “personal, educational and scientific situations” of PISA’s assessed items in mathematical literacy. On the other hand in the 2000’s, “probability in simple random situations” is the only phrase that is in the context. In addition, “concept” which is also the item what PISA focus, is also frequently used in the 2011’s: “very good knowledge of mathematical concepts”, “describe different concepts using mathematical forms of expression”, and “well developed reasoning over how the concepts relate to each other”. This is also comparable with the 2000’s: “use the concept of probability” is the only one phrase that contains “concept” in the 2000’s. Since these changes of wording in the final goals are associated with the assessed items of mathematical literacy in PISA, it can be said that there is high possibility of being influenced by testing items of PISA reports for better performance.

In light of the ESD theoretical background of this paper, providing situations in the process of learning seems an opportunity for evoking personal motivations in learning. Additionally in these parts from the both of versions, providing diverse situations in mathematics of 2011 can play a crucial role in regard to pupils’ motivation for actions since there is not much room to put ethical values or interdisciplinary approach. For instance, if the situations including globalization or environmental issues are given in the context of mathematical learning processes, it has a possibility to promote pupils’ attitudes or actions, when another similar situation is provided again.

Natural science subjects

The 2000 syllabus has a synthetic section for natural science before introducing the syllabi for biology, physics, and chemistry. This section is removed for the 2011 syllabus. This synthetic section provides a holistic view of natural science and contains aims, goals, the structure and nature of science studies, and goals that pupils should attain, as other subjects’ do. Although we cannot compare the texts from two syllabi, definite reasons why this part is dropped out in the new syllabus can be discussed.

The beginning of this synthetic part introduces the text for a common syllabus for all natural science subjects: biology, chemistry, and physics. It mentions that man’s fascination and curiosity about the nature are stimulated by natural sciences, and it contributes to society’s efforts toward sustainable development and encourages desires and the joy of discovery of nature. As seen in other syllabi, “goals to aim for in natural sciences” is divided into two sub goals. One goal concerns nature and man. It provides the systemic view and analysis of humans’ cultural influences on nature, the perspective of interrelationships, and so on. Another goal concerns the use of knowledge, which is about responsibility to nature and abilities to use scientific knowledge with critical attitudes and respects for other people’s opinions.

The section “the structure and the nature of the subject” of natural science articulates the characteristic of the synthetic part.

Many tasks require each and everyone to have knowledge of science, especially when it comes to environmental and health issues. Focusing on such issues in teaching creates opportunities for pupils to develop their ability to use scientific knowledge and reasoning as a basis for forming their views. The education thus affects pupils both as individuals and as citizens of society. ... It is also important that the education gives prominence to a wide spectrum of arguments, covering ethical, aesthetic, cultural and economic aspects, which are of relevance in discussions concerning Man’s ways of living together and
It states that studying natural sciences contributes to environmental and health issues for people as well as to encourage people to play the role of citizens in society. This emphasizes the role of natural science education to develop citizens’ values and attitudes. In addition, it describes wide spectrums and views in reference to living with nature, considering all the ethical, aesthetic, cultural, and economic aspects as important roles of natural science education.

From the perspective of ESD, this part seems to give a holistic approach to enable interdisciplinary education. The common aims and goals and the illustration of the nature of natural science can be seen as room for teachers and students to integrate and interlink the three natural science subjects. In other words, this part seems to play a crucial role in providing the perspectives of the three pillars of sustainable development and the ethical values with the importance of responsibility as a citizen to deal with the environmental issues. It is not explained why this synthetic part of natural science is dropped out for the version of 2011. However, it can be said that the role of this part was disregarded when the new curriculum was produced. As the situational contexts were described in the section 4.1.2, essentialism as a school of thought that was dominant could influence this change. Since essentialism in education emphasizes the teaching based on knowledge and evidence-based experiences, philosophical and value-focused texts would be regarded as less important to make the curriculum more effectively to give scientifically based knowledge. In addition, when the proposition of the new curricula submitted, this part as an unclear guideline would be chosen to be removed to provide effectiveness in the curriculum for better learning outcomes. (Björklund, 2008) Considering that “core contents” and “knowledge requirements” are introduced with the aim at improving pupils’ achievement and subject-specific competencies, it is possible that the focus of information and voices embodied in the synthetic part fell outside the interests of those situational contexts.

**Natural science subjects - Biology**

<table>
<thead>
<tr>
<th>2000</th>
<th>2011</th>
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<tbody>
<tr>
<td>Aim of the subject and its role in education</td>
<td>Aim</td>
</tr>
</tbody>
</table>
| The subject of biology aims at describing and explaining nature and living organisms from a scientific perspective. At the same time the education should consolidate the fascination and joy of discovery and Man’s wonder and curiosity in all that is living. The subject also aims at making knowledge and experiences usable to promote concern and respect for nature and one’s fellow men. | · Develop knowledge of biological contexts, and their curiosity and interest in getting to know more about themselves and nature  
· Put questions about nature and man based on their own experiences and current events  
· Look for answers to questions by using systematic studies and different types of sources  
· Develop critical thinking over their own results, the arguments of others and different sources of information  
· Develop an understanding that statements can be tested and evaluated by using scientific methods  
· Use and develop knowledge and tools for expressing their own arguments and examining those of others in contexts where knowledge of biology is of importance  
· To manage practical, ethical and aesthetic situations involving health, use of natural resources and ecological sustainability  
· Develop familiarity with the concepts, models and theories of biology as well as an understanding of how these are developed in interaction with experiences from studies of nature and people  
· Develop the ability to discuss, interpret and produce texts and various forms of aesthetic expression with scientific content  
· Differentiate between scientific and other ways of depicting the world  
· Get an insight into the world view of science with the theory of evolution as a foundation, and also get |
| Goals to aim for | <Concerning nature and man> |
| · Develop their knowledge of different forms and conditions of life  
· Develop their knowledge of the interaction between organisms and their environment  
· Develop their knowledge of the structure of the human body and its functions  
· Develop their knowledge of the effect of puberty on the individual  
· Develop their knowledge of the conditions and development of life and are able to see themselves and other forms of life from an evolutionary perspective | <Concerning scientific activity> |
| · Develop their knowledge of the importance of biology for man’s way of representing, using and experiencing nature  
· Develop a knowledge of different working methods in biology such as field observations and laboratory |
work, as well as a knowledge of how these interact with theoretical models

<table>
<thead>
<tr>
<th>Aims of Biology subject. Based on the Skolverket 2000, p. 44. and Skolverket 2011, p.105.</th>
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</thead>
<tbody>
<tr>
<td>&lt;Concerning use of knowledge&gt;</td>
</tr>
<tr>
<td>· Develop their concern and responsibility when using nature</td>
</tr>
<tr>
<td>· Develop the ability to discuss questions concerning health and inter-personal relationships on the basis of relevant biological knowledge and personal experiences.</td>
</tr>
<tr>
<td>perspectives on how this has developed and what cultural impact it has had.</td>
</tr>
<tr>
<td>· Use knowledge of biology to examine information, communicate and take a view on questions concerning health, natural resource use and ecological sustainability</td>
</tr>
<tr>
<td>· carry out systematic studies in biology</td>
</tr>
<tr>
<td>· use concepts of biology, its models and theories to describe and explain biological relationships in the human body, nature and society</td>
</tr>
</tbody>
</table>

“Aim of the subject and its role in education” in a biology syllabus of the 2000’s also states about the ultimate role and the aim of biology. Thus, it contains the aim at “explaining about living organisms and nature”, “the fascination and joy of discovery”, and “promoting concerns and respects for nature and one’s fellow men”.

This part seems to associate with ESD perspective, since the explanation of biology as ‘knowledge’, fascination and joy as ‘driving forces’ and concerns and respects as ‘ethical values’ constituted the aspects to enable the norm transition toward sustainable development. One difference between “living organisms and nature” and “nature and one’s fellow men” indicates the unclearness of the ethical perspective. Applying the perspective of strong sustainability to them, those can be related to this view since men are not depicted as a controller of nature. However, men does not seem as a part of nature in “nature and one’s fellow men” either, which makes a distance from strong sustainability. On the other hand, “living organisms and nature” seems to have a broader perception than the former one, since “living organisms” cover both animal and vegetable life. Although statements of this part make harmony in knowledge and values, and use words indicating the relationship between nature and living organism, it also seems to confuse their ethical perspective between weak and strong sustainability.

As we could see in the mathematics subject, “goals to aim for” of biology are also divided in the 2000’s, while not in the 2011’s. Before examining the reason of integrating of the categorization, another difference will be examined first. In the 2011’s, there are significantly different expressions observed which cannot be observed in the 2000’s: For instance, “Understanding that statements can be tested and evaluated by using scientific methods”, “expressing their own arguments and examining”, “to discuss, interpret and produce texts and various forms of aesthetic”, “answers to questions by use systematic studies”, and “critical thinking over their own results”. These are associated items with scientific literacy, which was described in the background information about PISA. These five items are occupied out of the total nine items of the aims of biology in the 2011’s. On the other hand, only “discuss questions concerning health and inter-personal relationships” seems to be a corresponding aim in the 2000’s.

This focus of scientific literacy can be the main reason of the change of categorization. Categorizing of “concerning nature and man”, “concerning scientific activity” and “concerning use of knowledge” is to provide thematic aims, however it seems that this purpose was needed to be reconsidered in order to turn the focus to the competencies for literacy. In the process of reconstruction, several concepts and wording are also changed. “Field observation and laboratory work” and “responsibility” are dropped out. In addition, “interaction between organism and their environment” and “concern and responsibility when using nature” are changed into “interaction with experiences from studies of nature and man” and “perspectives on how this has developed and what cultural impact it has had”, respectively. In particular, as discussed in the earlier part, “aim of the subject and its role in education”, the phrase “organism and their environment” implies the consideration of not only human but also all the organism such as plants and animals. However the changed word, “man and nature” implies the separation between man and nature. From this perspective, the former one can be regarded as strong sustainability and the latter one is weaker than the former one. In addition, “responsibility” is changed into the rather vague wording “cultural impact”. In lexical meanings, “responsibility” is defined as “the state or fact of having a duty to deal with something or being accountable”, while “cultural impact” means “effect” of “customs or social behaviours” (Oxford dictionaries, 2013). In this sense, the former one is regarded as a word for motivating “personal” or “group” actions, the latter one can provide weaker motivation, since it is rather far from personal boundary. According to Arbuthnott, described in the theoretical background of this paper, the more intention is personal, the higher possibility to take actions is emerged. (Arbuthnott, 2008) Therefore, these changes observed in the 2011’s indicate that the strong ethical basis and core aspects for motivating actions have
been comparatively regarded as less important than while restructuring the items of aims in biology subject.

<table>
<thead>
<tr>
<th>Goals that pupils should have attained by the end of the ninth year in school</th>
<th>Knowledge requirements at the end of the year 9 (Grade A)</th>
</tr>
</thead>
</table>
| <Concerning nature and Man>  
· have a familiarity with some of the world’s ecosystems and how interrelationships between organisms can be described in ecological terms,  
· have an insight into photosynthesis and combustion, as well as the importance of water for life on earth,  
· be able to give examples of recycling and accumulation in an ecosystem,  
· have a familiarity with how cells are built up and how they function,  
· have a familiarity with genetic heredity,  
· be familiar with the basic features of the development of life, as well as the conditions for and importance of biological diversity,  
· have a knowledge of what conception involves,  
· have a knowledge of the biology of sexual life, contraception and sexually transmitted diseases,  
· have a familiarity with the organs of their own bodies, their systems and how they function together,  
· have a knowledge of the effects of addictive substances on health,  
<Concerning scientific activity>  
· be able to make observations in the field and carry out experiments, as well as have an insight into how they can be designed,  
· be able to carry out and interpret simple measurements of environmental factors,  
· be able with help from examples to show how discoveries in biology have influenced our culture and world view  
<Concerning use of knowledge>  
· be able to use not only scientific, but also aesthetic and ethical arguments in issues concerning the preservation of different types of nature and diversity of species, as well as the use of genetics,  
· be able to provide historical examples describing how a knowledge of biology has contributed to the improvement of our living conditions, as well as how this has been abused,  
· be able to discuss sexuality and inter-personal relationships and in this show respect for the views of others and different forms of inter-personal relationships,  
· be able to take part in discussions on the importance of regular exercise and good health habits | Pupils can talk about and discuss issues related to health, natural resource use and ecological sustainability, and differentiate facts from values, and formulate their views with well developed explanations and describe some of the possible consequences. In their discussions, pupils put questions and put forward views and respond to views and arguments in a way which carries the discussions forward and deepens or broadens them. Pupils can search for information about the natural sciences and use different sources and apply well developed and well informed reasoning about the credibility and relevance of their sources and information. Pupils can use the information in a well functioning way in discussions and create well developed texts and other communications with good adaptation to purpose and target group. Pupils can carry out field studies and other studies based on their own planning and also formulate simple questions and planning which after some reworking can be systematically developed. In their studies, pupils use equipment in a safe, appropriate and effective way. Pupils can compare results with their questions and draw well developed conclusions with good connection to the models and theories of biology. Pupils apply well developed reasoning concerning the plausibility of their results in relation to possible sources of error and make proposals on how the studies can be improved and identify new questions for further study. In addition, pupils draw up well developed documentation on their studies using tables, diagrams, pictures and written reports. Pupils have very good knowledge of the theory of evolution and other biological contexts and show this by explaining and showing relationships between them and some general characteristics with good use of the concepts, models and theories of biology. Pupils can apply well developed and well informed reasoning about health, sickness, sexuality and heredity, and show complex relationships involving the structure and functions of the human body. Pupils study the impact of different factors on ecosystems and populations and describe complex ecological relationships and explain and make generalisations concerning the flow of energy and ecosystems. In addition, pupils apply well developed and well informed reasoning about how people impact nature and show from different perspectives the advantages and limitations of some measures that can contribute to ecologically sustainable development. Pupils can explain and generalise about some main scientific discoveries and their
Final goals for biology in the 2000’s and the 2011’s also coincide with their aims for biology. As the aims are categorized into three in the 2000’s, the final goals for biology also do. What is different is that the final goals contain the ways in which knowledge or skills are internalized for students. Particularly in two biology syllabi, the ways of imparting knowledge are comparable. For this reason, analyzing the used verbs can provide the different pictures what educations expected ten years ago and what they expect now from students after the completion of education.

In the 2011’s, what pupils can do with biology education is mainly to express and discuss. On the other hand, pupils can have a familiarity, knowledge and insight after the completion with the 2000’s. As we can see from the table beside, the used verbs in two versions of goals in biology are listed and counted.

Table 10. The number of used verbs in the goals for biology in the 2000’s and the 2011’s

| 2000’s       | 2011’s       | Verbs of the 2011’s such as “Talk”, “discuss”, “formulate”, “put questions”, “respond”, “create texts”, “compare”, “make proposals”, “draw up conclusions and documentation”, “describe” and “explain” seem closely related to the scientific literacy that is a main test item in PISA. Compared to this, frequently used verbs in the 2000’s such as “have a familiarity”, “insight”, and “have a knowledge” seem quite far from the focus of scientific literacy. Even though verbs in the 2000’s such as “give examples of”, “interpret”, “discuss” are relevant to scientific literacy, it still shows a significant difference in the extent of their dominations in the texts. We can see the wording in the 2000’s is rather goals-oriented. Applied to the ESD theoretical backgrounds, exercises of expressing and discussing in pupils’ own voices about ecological issues can be seen possible factors for actualization in their daily life. On the other hand, “familiarity”, “insight” and “knowledge” are not directly related to certain actions. However, as Umeå university, Tranas municipality and Karlstad University opposed to the idea of specified syllabus (Björklund, 2008), it can be pointed out that the specific skills oriented curriculum is likely to have little room for teachers to have opportunity to interpret with their own reflection. In other words, although the 2011’s goals in biology can play a role in motivating pupils to express own opinions, this can be only skills they could get after completion, since rooms for integrating teachers’ reflections and values were reduced. Moreover, the changed focus of scientific literacy more than before affects goals such as “not only scientific, but also aesthetic and ethical arguments in issues” and “provide historical examples”-- integrating social and ethical perspectives into “knowledge” and “insights” achieved from biology of 2000’s syllabus--to be downgraded and dropped out in the new syllabus of biology.

“Core contents” and “The structure and nature of the subject”

Since “Core contents” in the 2011’s and “The structure and nature of the subject” in the 2000’s do not have correspondents to be compared, I will discuss the characteristics of each and interpret the reason why “the
structure and nature of the subject” is dropped and “core contents” is added in the new curriculum based on the situational contexts and the result of other sections’ comparison.

As the proposition from the government stated, “core content” was suggested in order to lead educational proficiency for planning and to express subject-specific competencies clearly. (Björklund, 2008) We could find the purpose also in the introductory part of the 2011’s curriculum document: to provide clear teaching scope for teachers. (Skolverket, 2011) Under the “core contents”, three categories for “in years 1-3”, “in years 4-6”, and “in year 7-9” are outlined, and several thematic sub-categories are incorporated to each. Mathematics’ core contents, as an example, specify what to teach in “understanding and use of numbers”, “algebra”, “geometry”, “probability and statistics”, “relationships and change” and “problem solving”. Each sub-category covers at least two and at most seven items. Examples of the items are randomly chosen in the level for years 7-9:

Algebra
• Meaning of the concept of variable and its use in algebraic expressions, formulae and equations.

Geometry
• Representation and construction of geometrical objects. Scales for reducing and increasing two and three dimensional objects

Problem solving
• Strategies for problem-solving in everyday situations and in different subject areas and also evaluation of chosen strategies and methods. (Skolverket, 2011)

As we can see, items are elaborated upon the aims of mathematics, and they are also based on the “knowledge requirements” of mathematics. As we pointed in the section for the final goals in mathematics, “problem solving” of the “core contents” contains the items coupled with “situations”, which was regarded to associate with the test items of PISA reports.

On the other hand, “The structure and nature of the subject” which is a part of every subject’s syllabus in the 2000’s, gives an inherent philosophical idea of every subject. Thus, it has a unique voice compared to the rest part of the syllabus of 2000 and to the 2011’s syllabus.

Mathematics is a living human construction involving creativity, research activities and intuition. Mathematics is also one of our oldest sciences and has been considerably stimulated by the natural sciences...Mathematics may also be used to solve problems, which are directly linked to concrete reality... (Skolverket, 2000)

... The subject also covers the aesthetic and ethical aspects of experiences arising from contact with nature. Questions on the preservation of natural species are dealt with by the tools of science as well as the inspiration and ideas originating from other human activities, such as outdoor life, art and literature. ... One of the most important contributions biology can make to studying man’s relationship with nature is thus to show the diversity of forms of life from scientific, aesthetic and ethical perspectives.... (Skolverket, 2000)

The former one is an excerpt from “the structure and nature of the subject” in the mathematics syllabus and the latter one is an excerpt from the biology syllabus. As we can see, this section describes historical perspectives, general illustrations of the subject’s characteristics, relevant research topics for the near future, contributions to a society, and so on. This part seems to aim at helping readers to understand the subject itself as well as identifying the fundamental aims of the subject in order to provide value and to broaden the grasp of the subject to both teachers and students.

What can be imparted from the “core contents” and “the structure and nature of the subject” are considerably different due to the different goals of each text. The reason of removing this different voice, “the structure and nature of the subject”, was not clearly described in either the curriculum document of 2011 or the proposition for the new curriculum. However, a decrease in the number of categories implies that there was a strong motivation and agreement to concentrate on “core contents” and “knowledge requirements” by clearing unnecessary parts out, when the new curriculum made. We could find this intention in light of situational contexts of the new
curriculum reform. It was stated that subject-specific goals and clearer aims in the syllabus were expected to contribute better conditions to increase effectiveness. (Björklund, 2008) This intention of reforming the syllabus to be more effective in teaching and in measuring learning outcomes is possible to influence on cutting out the parts which were not in accord with the intent. In consequence of deleting the parts such as “the structure and nature of the subject”, it could have little room for embracing immeasurable values and philosophies, which might not be exactly connected to the “effectiveness” in the then-current contexts.

4.3. Interpretation with social contexts

The analysis with two curricula and two syllabi found out changes, and discussed about underlying motivations in the light of the situational backgrounds, the relevant information, and the theoretical perspectives. Overall, certain flows between the year 1994 and 2011 are observed from those changes. In the new curriculum published in 2011, whole curriculum documents are clearly guided with subject-specific competencies. In the introduction part of the curriculum and the syllabus in the 2011 document, acquiring and developing knowledge as well as providing clear teaching scope are set as the primary aims. As a result, ‘skills’ are emphasized in the Swedish syllabus, ‘literacy’ is focused in the natural science, and ‘concepts’ and ‘situations’ are frequently stressed in the mathematics syllabus. This characteristic is coupled with several contexts. First, when the new curriculum was proposed by the Swedish government, clear guidelines along with effective tools to evaluate and to plan the class were emphasized (Björklund, 2008). This idea aimed at encouraging students to strive more and increase their achievement. For this reason, ‘core contents’ and ‘knowledge requirements’ were made in the new curriculum (Björklund, 2008). The similar directions of societal flow have been observed around this period in policy areas, philosophy and social changes in Sweden. To reflect on the discussion and to illustrate the changes, relevant articles were reviewed, and the opinions of current education following the new curriculum of two chosen teachers were heard, which will aid to illustrate the analysis.

4.3.1. Impacts from PISA

According to the Ringarp and Rothland report, even educational sectors, which have tended to remain within cultural and traditional domains, have started to become involved with policy borrowing because of international assessment such as PISA reports. Since the rankings amongst different countries that utilize those assessments have been influential, the study of comparative differences and the reasons behind the observed results have been increasingly studied between countries (Ringarp & Rothland, 2010). As this article pointed out, Sweden, as an example, has studied considerably influential factors of students’ achievement in recent years. From one study by the Swedish National Agency for Education, age and school years, which are used as the unit of targets in different international assessments such as TIMSS (Trends in International Mathematics and Science Study) and PISA, were studied since they may affect the different rankings of Sweden in the international assessment of students’ achievement (Skolverket, 2011). Another Swedish Agency for Education also examines significant characteristics of Swedish education on pupils’ achievement with the background of the declining outcomes of international assessments (Skolverket, 2009). Paralleled to these studies, “Breadth of Policy Impact Index” which represents policy responses to a broader range of PISA result categories in the country, indicates Sweden being the 12 out of 16, which corresponds to 5th out of 37 countries (Breakspear, 2012). Considering the context of growing concerns about PISA reports in Swedish society, the proposal for clearer curriculum and the changes observed in the new curriculum seem to be closely related to the decreasing results from international assessments, particularly PISA reports.

Interview with two teachers; Amy in an upper secondary school, and Ben in a secondary school illustrated the contexts with expressing their personal concerns regarding the question about PISA reports. In the upper secondary school where Amy works, the administration attempted to install additional math classes in order to upgrade pupils’ achievement in the mathematics test of PISA. The teacher of the secondary school pointed out that higher level of mathematics in the new 2011 syllabus was observed and he referred it as a reflection of growing concerns about the decline of mathematics results in PISA reports.

Yes, our students in Sweden are getting not so good in mathematics, so one of my colleagues has maths as a

3 Interview guidelines are attached in the appendix.
special major getting extra paid for working with that and we are trying to do some changes in math education here to improve and getting our students who learn more. ... This kind of, a lot of discussion. I think we are doing more and more about that. (Amy)

PISA reports? I don’t know about it so much but I know that Sweden has quite low result in Mathematics so I think the new curriculum, for instance in the mathematics, is trying to make it more difficult and level up to make it compete with other countries. We are not talking about PISA that much but we talk about comparison with other schools in different city. We become higher results in several years. (Ben)

Ben explained the competitive atmosphere between schools but he said discourses on PISA haven’t been brought up that much in his school. However, “higher results” and “comparison” seem to imply the issues and concerns being around the secondary school. The focus of the results and rankings go along with the situational contexts of producing the 2011 curriculum—the main emphasis of proposed curriculum was on the increasing achievement. Although PISA was not mentioned in the school, the reasons of focusing such results and competition can be in the line with the context of declines in the results of PISA. Since studies regarding international assessments and ‘Breadth of Policy Impact Index’ indicated the Sweden’s growing concerns at political level, it can be assumed that social interests and social acceptance of achieving better results in PISA reports would be increased. Applying Kelman’s social influence theory to this context, people could be likely to change their choices and decisions in order to receive favor responses from the mainstream. (Kelman, 1961) In this sense, stressing of comparison with other schools’ learning outcomes can be interpreted as a decision for meeting what a society needs and expects in the current flow due to the decline in international assessments.

4.3.2. Changes in Swedish Society

Overall societal changes in Sweden in this period are considered influential factors bringing the changes. Since the early 1990’s, there has been a new school of thought called “essentialism” which gave challenges to the dominated progressivism, as described in the earlier section of this paper. Evidence-based knowledge and teaching scientifically are the ways of essentialism in education, which is rather disciplined and separated in each subject. On the other hand, progressivism in education is integrated and democratic values based, which focuses on contemporary societal problems. The characteristic of the new curriculum goes along with the essentialism although it also has some progressivism aspects. In particular, while the new curriculum tries to focus on clearer goals and guidelines, democratic values and cultural aspects in their aims and syllabus were dropped out: this shows the change of philosophical ideas from progressivism to essentialism, clearing out some non-scientific knowledge. ‘The structure and nature of the subject’ is also one example that covered values and philosophical ideas that indicate its role of society, but it was removed in the new curriculum.

Other changes in Swedish society from 1990’s could be associated with the essentialism and the need of new curriculum. As mentioned above, influential factors to pupils’ achievement were studied by the Swedish National Agency. Decentralization, streaming, segregation, and individualization were pointed out as the characteristics of societal change as well as the influential factors to pupils’ educational performances in the period between mid-1990 and late-2000. They explained that segregation was caused by school choice reform, the economic crisis, and a huge influx of immigrants, while decentralization was brought in the 1990s in order to allocate resources appropriately. Streaming and individualization were pointed out as common phenomena in education. According to the article, since previous education had so much room that pupils took a lot of responsibility instead teachers did, levels between pupils had been increasingly differentiated (Skolverket, 2009). Considering that several issues of the previous curriculum were raised, a paradigm of thought, called essentialism and the need of clear goals and standards for a better outcome seem to be well-accorded to the social needs. These changes and needs of society are also coincided with the Sweden’s growing concerns about the declines in PISA international studies as discussed above.

4.3.3. Influences on ESD from curriculum change

Unlike topics of related to “why pupils’ performance has been decreased”, which were focused by many studies, there are not many studies that touch upon what has been missed in this change of flow. In the article by Ringarp and Rothland, it is pointed out that policy changes and policy borrowing need careful researches since it is still a developing area associated with its societal and historical backgrounds that makes difficult to tell how the change will go and what it will bring to the society (Ringarp & Rothland, 2010). Even though the new change might bring about expected results, what have been disregarded and fall behind could also generate unexpected
outcomes and impacts.

The previous curriculum put “democratic values” and “respects for intrinsic value or each person as well as for the environments” in its fundamental values. The aim of 2000’s syllabus that focused on “pleasure”, “creativity”, “freedom” and “integrity” was also in the line with the fundamental values. Here also stressed that the achievement of the aim should be taught by subjects as well as integrated into organization and the coordination of teaching, which implied the possibility of the norm transitions. In parallel with the fundamental values and the aims, the “goal” of knowledge was categorized into two; one of which is emphasizing students’ attributes and ethical values. However, as mentioned before, this category was disappeared in the 2011 curriculum. In addition, in the syllabus part of the 2000 document, identity, imagination, and cultural aspects were stressed in the Swedish subject and similarly in the mathematics subject. Aims of mathematics were also separated into two when one part was added to focus on cultural and historical aspects. However, this category in the aim of mathematics was also dropped out, and cultural and historical aspects fell behind together in the new syllabus. Similar things happened in the natural science syllabus. There was a synthetic part in natural science for biology, chemistry, and physics, which gave holistic and interdisciplinary approach. In addition, “the structure and nature of the subject” were a part of every subject to present roles of the subjects, values, and philosophical views. They also came to be omitted in the new curriculum due to the aim for providing clearer guidelines with the focus of effectiveness to improve study outcomes.

As curricula and syllabi were analyzed respectively from the ESD perspective, we could see previous curriculum and syllabus contained many aspects relating to ESD, particularly in terms of their focuses. The focus of discourses in the previous curriculum corresponded to not only the definitions of sustainable development but also the fundamental values and ethical perspectives. Moreover holistic and goal-oriented items in it were related to the opportunities for teachers to reflect their own approach. This aspect is linked to ESD since it can embrace diverse perspectives and integrates values with ethics in a class. This can be compared with the new curriculum which provided comparatively limited and definite boundary of skills and knowledge. Even though there are a number of words and statements observed that were indicating sustainability in the new curriculum and syllabus, ethical foundations and the role of values in motivating pupils with their attributes were less mentioned due to the focus of discourses that has been moved to improving and measuring learning results. Having given way to the need of clearer goals and guidelines, the new curriculum and syllabus have relatively little room for integrating pupils’ attributes and immeasurable values.

Nevertheless, some parts of those changes in the 2011 document seem to be linked with aspects of ESD. Its focus on skills of literacy in the new curriculum can play a role in motivating personal decision making. Literacy skills such as “expressing” pupils’ opinions and exercises for “discussion and explaining” are mentioned frequently in mathematics’ and biology’s syllabi of 2011. In addition, aims and goals of mathematics were stressed to apply skills in the ‘situations’, which is regarded to be influenced by test items of PISA. These aspects are possibilities to bring effective achievement in ESD, since building up students’ own opinions and applications in their own situations are closely related to actualization in daily life. Applied to the three levels of norm transition by Wickenberg and Leo (2009), this aspect in the 2011’s could be applied to the ‘knowledge’ and ‘driving force’, despite the results that ethical values and emotions as driving forces lacked as we discussed in the analysis—aims and fundamental values indicated in the 2011’s did not exactly match ESD perspectives as well.

Relevant answers were responded in the interviews of the two teachers, when they were asked to scale from 1-5 from less important to most important for their pupils in education. Items included “reading skills”, “writing skills”, “mathematical skills”, “knowledge about society”, “knowledge about history”, and “ESD”. Both of the teachers gave the greatest importance on reading and writing skills and the least on the knowledge about history and society, inspite of the different working places and backgrounds they have.

*Reading, writing, language skills are always important whatever you will do. That is why I put high scores. Why mathematic is important is it has a role for brain opener and you can structure up.* (Amy)

*Language skill is one of the most important things anyway because you need this whatever you do. So I put 5 on it. I will put 4 on reading and writing skills.* (Ben)

*And those are not so important. (pointing at history and society)* (Amy)

We could see what two teachers’ emphasized in education are coincided with the focuses of the new curriculum -- measurable skills for better learning outcomes. Knowledge about history and society, on the other hand, were
regarded comparatively less important than other items for them. Applying social influence theory to this result, when “reading and writing” skills were valued more than “knowledge about society and history” in their belonging groups, people tend to meet their expected roles in those groups. In this sense, this can be interpreted that two teachers’ choices reflected to what they were expected in their education field or other social environments.

Responses on ESD also seem to be cohesive to what was observed in the analysis of discourses. They said that they hardly heard about ESD but frequently heard about SD. Both of them gave the middle points to ESD when they scaled items, and they explained their related classes using environmental issues and facts in their biology classes.

Not so much. A little bit. We just do recycle which we haven’t done before. It was harder to start than we expected. I think we don’t talk about it enough ... I have heard about SD but not really teaching methods... Not a special teacher for ESD in this school. What we do is that try to put SD into every subject so if I talk about biology I talk about it inside and if I talk about chemistry then I talk about this inside. But not like ‘Let’s talk about sustainable development for this whole week’. But we talk about it inside of classes. For instance, we talked about acidification today in the eighth grade and at the end of the class, we talked about what we can do, what society can do something like that. (Ben)

Not much. They (headmaster and school staffs) think it is something in biology area. ... Not really heard about ESD. I read journal and probably it would be there. But, social science students learn more about sustainable development when they learn biology. Although we don’t have special teacher for SD but we have case methods which is relevant for reality to integrate more than one subject. It has not implemented yet but for instance, fishery issue, diversity, threats of farming plus political issues from social subjects will be started working together and talked more from this august in plan. (Amy)

According to them, there had been little discourse about SD or ESD in their schools, but one teacher said that they will implement ‘case study’ which integrates natural science subjects and social science subjects for approaching thematic issues. Considering that ESD is not just ‘teaching of SD’, the implementation of interdisciplinary approach for dealing with sustainability issues is a strong possibility to achieve ESD, although they hardly have discourses about SD in their schools. However, still the integration with values and ethics which are the essential basis of ESD could not be observed during their explaining about ESD of their schools. These opinions could illustrate the lack of democratic values and ethical values in the curriculum of 2011, which could not contribute to build ESD on the ethics and values learning.

5. Conclusion

What should constitute an education curriculum? The answer to this question would be different depending on what purposes of education are given priority. Academic knowledge itself can be more focused than other types of knowledge. Practical skills for jobs might be given top priority by people who strongly support the role of education in that it must help students to develop careers after graduation. On the other hand, priority can be placed on values and morality education (Bailey, 2011). Of course, these three areas of education can be interlaced in an education curriculum; however, the content of a curriculum is affected by the selection of an educational philosophy’s authoritative and cultural tradition (Westbury, 2000). When the curriculum change was suggested in 2008, reasons from inside and outside of Sweden affected new suggestions for what should be focused in the new curriculum. Amongst many reasons, the impact of PISA reports was chosen as one of the influential factors to influence on current Swedish education by Lundgren (Lundgren, 2013). Lots of articles by scholars and reports by the Swedish National Agency for Education were concerned about PISA reports and their declines in results over a decade. (Breakspear, 2012; Skolverket, 2011; Skolverket, 2009; Ringarp & Rothland, 2010). However, what this concern brings in Swedish education and what it will mean to Swedish education are rather unknown. In this paper, particularly, Education for Sustainable Development is questioned about how it is influenced by this change.

ESD is not a new concept of education but refers to education aiming at sustainable development by the support of integrative and holistic approaches based on ethical values, which enable linking knowledge and actions. Although destruction of nature and climate changes have given rise to the call for sustainable development,
many actors such as individuals, business and countries are still likely to step back from the issues and imputing responsibilities to ‘other actors’. To fulfil the gap between information and actions is one of the main reasons that ESD has been focused. For the reason, ESD has a crucial role to achieve the ethical awareness, values and attitudes accorded with sustainable development. (German commission for UNESCO, 2011) To analyze the changes observed between the curriculum of 1994 (the syllabus part of the 2000’s) and 2011, characteristics and core factors of ESD were made as an analytical tool in this paper. Another analytical method was developed in reference to the aims and assessed items of PISA reports for examining the influences of PISA reports. In order to help these analyses, situational contexts of producing the 2011’s curriculum and PISA results were reviewed. Interpretation with social contexts using articles and interviews was finalizing all the results with the help of social influence theory. Discourse analyses of the texts, processing and social contexts are mainly used in the comparison of two curricula of 1994 and 2011, and two syllabi of 2000 and 2011, respectively.

The results of the analyses indicate that the 2011’s syllabus of Swedish, mathematics and biology are closely related to the test items of PISA assessment. Compared to the 2000’s syllabus, skills of explaining, describing, discussing and expressing, which are literacy skills, were frequently listed in their goals and aims. ‘Concepts’ and ‘situations’ that are related to test items of PISA were used frequently as well. By adding and specifying literacy skills in their aims and goals, several categories and aspects were removed or less mentioned compared to the previous curriculum and the syllabus. Cultural aspects in the syllabi of Swedish and mathematics were removed and category for pupils’ attributes and social or ethical values were also removed in the syllabi of mathematics and biology. These changes were aiming for giving clearer goals and knowledge in order to evaluate achievements effectively and to improve pupils’ learning outcomes, according to the proposition from 2008 for the new curriculum. (Björklund, 2008) A decline in PISA’s outcomes for reading, mathematics and scientific literacy since 2000 were associated with the contexts of proposing the new curriculum. (OECD, 2011) Transition in the school of thoughts from progressivism to essentialism also influenced the trend of education focusing on disciplined and evidence-based knowledge. (Elgström & Hellstenius, 2011) Coupled with these contexts, problems in the previous curriculum that was goals-oriented and contained flexible room for teachers were pointed out in that period. (Skolverket, 2009)

However, this change of direction in the curriculum even affected relegating the democratic values and respects for human and nature from its fundamental values. Instead of these values, the 2011 curriculum stressed ‘acquiring’ and ‘developing ‘knowledge and values’ as fundamental values, and they were re-stressed with the phrase of ‘promoting development and learning’. This change is possibly related to the focus on better outcomes and the purposes of PISA, which measure knowledge and skills to use them in today’s societies. (OECD, 2003) In the line with this, the new syllabus is also introduced as a tool for providing the clear teaching scope and grading guidelines with ‘knowledge requirements’ and ‘core contents’. In addition, ‘the structure and nature of the subject’ was removed along with the aims of the syllabus part for ‘pleasure, creativity, freedom and integrity’. The removed parts are immeasurable for grading, but as an ethical principle and norms, they are related to motivating students’ attitudes and behaviours in light of the theoretical perspectives of this paper. Overall, from the ESD theoretical perspectives, the 1994 curriculum and the 2000 syllabus contained a balance in knowledge, values, and integrative rooms for realizing an interdisciplinary approach. Literacy skills and providing situations that were focused in the 2011’s syllabus were also regarded as possible strength for ESD, which can make students to achieve their competencies of expressing own opinions about SD.

Although both weak and strong sustainability were discussed in the theoretical backgrounds, explicit discourses in both curricula and both syllabi were not observed. Relevant examples of weak/strong sustainability could be: ‘ecological contexts’ in the previous versions was changed into ‘sustainable development’ in the recent one; ‘organism and nature’ was changed into ‘human and nature’. The latter example seems to a change of perspective from strong to weak sustainability, but the former one is difficult to tell without more contexts. As teachers from the interviews explained ESD mainly within environmental issues, it is possible that the concept of SD is widely known, but the exact meaning of SD and ESD are relatively unknown. In this sense, the teaching of environmental issues with holistic approach based on ethical values would be more related to an appropriate approach of ESD than teaching of environmental issues just titled with SD.

As norm transition was described in the theoretical background of this paper, it is performed at three levels; cognition, driving forces, and systemic conditions. (Wickenberg & Leo, 2009) Applied this into ESD in Swedish curriculum, what they downgraded for the 2011’s would be crucial factors of the transition to sustainable development. For instance, cultural aspects can make knowledge fruitful, democratic and ethical values in ultimate aims of education also imply the norm of systemic conditions. Additionally, pupils’ pleasure and creativity, and intrinsic values of person and environment as driving forces can motivate their actions. Even if the skills and competencies of literacy for challenges in today’s society is in need and the new direction of Swedish
education is coupled with it well, what could have lost in the course of the transition and what will be influenced should be addressed for ESD in the perspective of the norm transition. Therefore, further study can be an analysis of educational changes observed by teachers and changes in their educational philosophies. Extended numbers of interviews with experienced teachers and scholars in the future study will give more interrelated and in-depth insights in educational transition. Also, social factors other than international assessments, such as political contexts and effect of globalization can be examined to shed light on the relation between education and a society from the perspective of sustainable development.

6. Acknowledgement

I would like to say that it was a grateful period of my life since I could be given great opportunities to encounter enthusiastic people and valuable moments in this master program, sustainable development at Uppsala. This enabled me to keep my passion in studying education for sustainable development, which became a tremendous motivation for me to truly enjoy my thesis work whenever I faced difficulties.

I would like to express my deep gratitude to various people for their contribution and assistance to my master thesis. First of all, to Bo Lewin, for his supervising and valuable critics and to Fereshteh Ahmadi, for her helpful advice and assistance, I would like to offer my great appreciation. Their willingness to give their time and assists have been very much appreciated during the long journey of my study. My grateful thanks are also extended to Elisabeth Almgren and Gloria Gallardo for their help in keeping me in progressing on this study with faithful encouragements and constructive supports. This work would not be finalized as the one I expected without their generous encouraging guidances.

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Special thanks should be given to my friends who helped review and provide generous advices in various ways. Finally, I wish to thank my family for all the warm supports and encouragement during the last two years and even more. Thanks for all the moments you believe me, they all raise me up.
7. References


[Accessed: 20 5 2013].

[Accessed: 20 5 2013].

[Accessed: 20 5 2013].

[Accessed: 20 5 2013].


8. Appendix

Interview guide line

Two teachers were chosen to be interviewed. Amy works at a private, upper secondary school located in Stockholm city center. Ben is employed at a public secondary school, located in a suburb of Uppsala. Interview schedules were arranged via email and phone calls in advance, along with a description of the interview aim and the approximate time. A detailed research plan was not provided, and participants gave permission to record the entire interview with the notice that the data would only be used for the purposes of this study. On average, 35 minutes were taken for each interview.

Briefing: Express appreciations for participation, introduce myself and backgrounds, define the interview condition for the interviewee (confidentiality, about 40 minutes taking, recording), state the purpose of the interview.

<table>
<thead>
<tr>
<th>Researcher questions</th>
<th>Interviewer questions</th>
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<tbody>
<tr>
<td>Has personal philosophical of education matched with school”s and society”s?</td>
<td>How old are you?</td>
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<td></td>
<td>How long have you been working as a teacher?</td>
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<td></td>
<td>Have you had any other work before being a teacher?</td>
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<td></td>
<td>What made you choose teaching as a profession?</td>
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<td></td>
<td>How old were you when you made that decision?</td>
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<tr>
<td>What is your educational background?</td>
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<td>Have you found your education useful for your work as a teacher?</td>
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<tr>
<td>What has been particularly useful?</td>
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<tr>
<td>What has been least useful?</td>
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<tr>
<td>Which subjects are you presently teaching?</td>
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<tr>
<td>Is this your choice, or what was available to you?</td>
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<tr>
<td>What knowledge or skills do you think are most important for your pupils?</td>
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<tr>
<td>Please grade on a scale from 1 to 5, where 1 is not important and 5 is very</td>
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<tr>
<td>important</td>
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<tr>
<td>Reading skills</td>
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<tr>
<td>Writing skills</td>
<td></td>
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<tr>
<td>Mathematical skills</td>
<td></td>
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<tr>
<td>Knowledge about society</td>
<td></td>
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<tr>
<td>Language skills</td>
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<tr>
<td>ESD</td>
<td></td>
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<tr>
<td>Knowledge of history</td>
<td></td>
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<tr>
<td>Other, please specify</td>
<td></td>
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<tr>
<td>If you have rated more than one area with 5, i.e. as very important, will you please elaborate on how you see the relative importance of these important subject areas!</td>
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<tr>
<td>Has ESD implemented to the school/your class?</td>
<td>In your present school, how is teaching of ESD organized?</td>
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<td></td>
<td>Is there a special teacher or any other person that is responsible for ESD being taught?</td>
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<td></td>
<td>Are other subjects, like “Living Together” (samlevnadsundervisning) that are not</td>
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<td></td>
<td>traditional subjects like mathematics, language etc organized the same way in your</td>
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<td></td>
<td>school as ESD?</td>
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</tbody>
</table>
Debriefing: Thank to interviewee for participation, ask to further comments or questions about this interview and ask permission to e-mail contact for further needs.

<table>
<thead>
<tr>
<th>Question</th>
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<tbody>
<tr>
<td>For how long have you been teaching ESD?</td>
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<tr>
<td>Was that originally your choice, or was it just allotted to you?</td>
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<tr>
<td>Have you found your educational background useful for your teaching of ESD?</td>
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<tr>
<td>Anything else in your background that you find important when teaching ESD?</td>
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<tr>
<td>What are the most important things related to ESD that you try to convey to your pupils?</td>
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<tr>
<td>Please, mention two or three things related to ESD that you want your pupils to remember also after five or ten years!</td>
</tr>
<tr>
<td>To what extent do you feel that you as a teacher have the support of your colleagues?</td>
</tr>
<tr>
<td>Is the same true for your teaching ESD?</td>
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<tr>
<td>To what extent do you feel that you as a teacher have the support of your headmaster?</td>
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<tr>
<td>Is the same true for your teaching ESD?</td>
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<tr>
<td>Have you considered trying to change which subjects you are teaching?</td>
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<tr>
<td>Why / Why not?</td>
</tr>
<tr>
<td>Have you considered trying to find employment at another school?</td>
</tr>
<tr>
<td>Why / Why not?</td>
</tr>
<tr>
<td>Has Bildung/philosophical aim driven education been changed during past years?</td>
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<tr>
<td>Have any of these opinions changed since you started as a teacher?</td>
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<tr>
<td>Was there anything special that made you reconsider your previous views?</td>
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<tr>
<td>Is there anything else you would like to add to better my understanding of your work as a teacher in general, and also as a teacher of ESD?</td>
</tr>
<tr>
<td>Have you heard about PISA?</td>
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</tbody>
</table>