IOSTE BORNEO 2014

Teachers' View of Sustainable Development in Swedish Upper Secondary School

Peter Gustafsson[a,]*, Susanne Engström[b], Anders Svenson[c]

[a, c]Mälardalen University, Box 883, SE-72123 Västerås, Sweden
[b]Uppsala University, Box 256, SE-75105 Uppsala, Sweden

Abstract

In Sweden the importance of sustainable development (SD) can be traced in political documents from the fundamental law down to the curriculum for different school levels. To investigate how this political objective is demonstrated in knowledge and activities among the teachers, eleven upper secondary school teachers from different subjects have been interviewed to map out their views of SD, their own beliefs and how they teach SD. The interviews have been analysed in terms of content with the Knowledge – Value – Practice model as theoretical frame. The results showed that among the interviewed teachers there existed a spectrum of views of what SD stands for, from a narrow view to a well-developed view. There were also differences in their teaching practice. All teachers stated that teaching for SD is of great importance and that they all did it in terms of their own personal definition. All of them also pointed out that even if the steering documents present SD as important, the local management of the issue is weak. The differences between the teachers' view of SD and the weak local management generate a fundamental problem. Depending on the teachers' own definition and content choice the pupils may get different content knowledge, perhaps not even consistent with the recognized definition of sustainable development. The schools cannot therefore be said to give the pupils an equal education in the area of SD.

* Corresponding author. Tel.: +4621101539.
  E-mail address: peter.gustafsson@mdh.se

1. Introduction

1.1. Background

In the Fundamental Laws of Sweden, sustainable development (SD) is mentioned even before democracy in The Instrument of Government (SFS, 1974). This gives a view of the position of sustainable development in Swedish society and political life. In 2003 the Swedish government appointed a committee for education for the teaching of sustainable development. This committee stated in its report the importance of the education system fostering knowledge of sustainable development and putting it into practice (SOU, 2004). They stated "that the present generation bears the responsibility for ensuring that future generations in every country in the world will be able to meet their needs" and therefore they "demand immediate vigorous measures".

The same view is further presented in the Government Communication (Regeringen, 2006) where it is stated that a sustainable development perspective must permeate all education in Sweden and such a perspective is described in the new curriculum for the upper secondary school, issued by Skolverket, that is The Swedish National Agency for Education (Skolverket, 2011). The new curriculum states that the environmental perspective should not only provide pupils with insights so that they can help prevent negative environmental impact, but also develop a personalized approach to the overall global environmental issues. It also declares that it is the responsibility of the school that each student can observe and analyse human interaction with their environment from the perspective of sustainable development.

1.2. Steering documents in the Swedish school system in relationship to sustainable development

The Swedish Parliament has passed the Education Act and the Ministry of Education and Research has to verify that it is realized through The National Agency for Education. Their mission is to issue steering documents including goals and knowledge requirements for preschool, compulsory school and upper secondary school. These are given in for example the curriculum for the upper secondary school and syllabi for the different subjects. Since sustainable development is not a subject, the commission to contribute to this field is formulated on different levels. The National Agency for Education states on its website that the commission is formulated on all levels: the Education Act, the curriculum and the syllabi (Skolverket, 2014).

It has earlier been investigated (Engström, Gustafsson, & Svenson, 2012) how the concept of sustainable development is presented in steering documents for the Swedish upper secondary school and especially the national technology program. Despite the effort on the highest political level to promote sustainable development, it was demonstrated by Engström et al. (2012) that both the Swedish Education Act and Upper Secondary School Ordinance lack written content about this concept. It is not until the Curriculum for the Upper Secondary School that the concept enters. It then also appears in the syllabi of different subjects and in the overall goals.

1.3. Earlier investigations

It has been revealed in an earlier interview study among upper secondary school teachers in Sweden that arguments for teaching in environmental education were based in what the teachers particularly cared about. This is described as personal anchor points within a selective tradition (Sund & Wickman, 2008). These points remind the teachers of their teaching aims and objectives, instead of the curriculum and goals stated there. These interviews were limited to teachers who taught Æˇıˇß°⌗science, with the main part of the content related to environmental issues.

In a nationwide questionnaire study with over 3000 upper secondary school teachers in Sweden it was found that teachers differ in their understanding of the concept SD mostly according to their subject traditions. This study also highlighted the need for further training in SD (Borg, Gericke, Höglund, & Bergman, 2013).

2. Aim of the investigation

From this background it is of value to investigate how teachers from different subjects understand their mission to teach sustainable development. It is also interesting to ask how they define this area of knowledge and if they register any planning or monitoring from the school management to find out if the strong political ambition is transformed into action in school. We are interested in how the commission in the steering documents is received by principals and teachers and also whether the teachers in the Swedish school system share a common view of what sustainable development stands for.

Such a view should hopefully be in concordance with a generally accepted definition, such as for example the Brundtland definition (1987). Since this broad definition cannot be covered by one school subject alone and sustainable development is declared as an overall learning goal in the curriculum for the upper secondary school, one can also expect the management at some level to have secured that a team of teachers covers the area. One can also expect the use of selected teaching methods suitable for the SD content.

3. Research questions

To limit the area of investigation we have a focus on upper secondary school and the teachers' views and actions there. We have formulated the following research questions:

- What are the teachers' views of sustainable development regarding content and the commission to teach it?
- How do they receive and conduct such a commission?

4. Theoretical framework

4.1. The teachers as research object

According to a meta-analysis of learning in school conducted by Hattie (2008), a way to learning is an active teacher leading the work in the classroom. The teacher has to investigate his/her own teaching and also activate the students in the learning process. On the basis of this result is seems natural to focus our investigation on the teachers to reach insight of how the concept of sustainable development is handled in the school system.

4.2. Theoretical frame for the analysis

The KVP model (Clément, 2006) describes how a conception can be analysed as interactions between scientific knowledge (K), values including for example opinions, beliefs and ideology (V) and social practice (P). The conception can be held by a researcher, a teacher, a student or other individual. A conception can only be analysed in one context, the situation where the investigation is undertaken (Clément, 1994). But by performing analyses of a situated conception in different settings, several facets will emerge and a conception of a topic can be presented (Clément, 2010). An interesting application of the KVP model is that social, or collective, representations (Moscovici, 1984) can be regarded as conceptions held by a group (Clément, 2010).

By using a suitable probing method, with components investigating a person's view of knowledge content in relation to a conception, that is the person's view of the scientific knowledge at that time, the researcher can analyse one part of the conception. In the same way the values for that individual, related to educational, economic and social values to justify a standpoint, and social practice, especially educational setting and conduction, can be interpreted.

Within the KVP model the conception is analysed as interaction between these poles. This can also be described as a didactic transposition. For example a person's opinion or beliefs regarding the scientific description of knowledge of a conception, such as relevance, limited or outdated knowledge, will affect the selection of the conception for presentation and will influence behaviour and practice in an educational setting.

4.3. Content frame for the analysis

To search for relevant data related to the three parameters in the applied model two different approaches have been used. To relate the knowledge description by the teachers regarding sustainable development to a widely accepted frame, we have used the definition of sustainable development provided by the Brundtland commission (1987): "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs". In this definition three pillars of conceptions of sustainable development can be identified: economic development, social development, and environmental protection (UN, 2005). But there are also arguments for a fourth pillar being culture diversity (UCLG, 2010). These four pillars provide a frame for the analysis regarding knowledge of sustainable development and we have used it as ground for categories when analysing the knowledge dimension.

Regarding the other two dimensions in the KVP model, value and social practice, the content of the interviews themselves has been the source for the construction of categories for the analysis. Thus we generated grounded categories from the interview data (Walsham, 2006). This choice was done since no obvious frame was at hand and the content was rich enough for this type of approach. The two different approaches for the content analysis are in accordance with a directed content analysis and a conventional content analysis (Hsieh & Shannon, 2005).

5. Methodology

5.1. Data collection and analysis

An interview guide has been constructed including a total of 23 questions about the conception of sustainable development, the commission to teach it and how the informants conduct this commission in their daily teaching. These questions have been grouped to the parameters in the KVP model, to ensure that probing questions for the teachers' knowledge, value and practice regarding sustainable development are in place.

The questions have then been used as a base for a semi-structured personal interview (Bryman, 2012) with eleven teachers from two different upper secondary schools in different cities. The teachers were asked by one of the researchers if they would like to volunteer to be interviewed. The teachers selected for the interviews covered all basic subjects taught in the major Swedish upper secondary school programs. The interviews took around 45 minutes each to conduct. All interviews were then transcribed verbatim.

The transcripts of the interviews have been analysed in accordance with the meaning-making method described by Burnard (1994). In this method it is given that the transcripts are interpreted in accordance with relevant literature, in this case the KVP model, and generalized. The method includes a search for units called 'meaning units' in the transcripts which are then categorized in terms of the content in these meaning units. The transcripts were read through by one researcher, looking for similarities among the meaning units. Such similar units formed clusters that could be labelled as belonging to a common category. These categories could be seen as summarizing the content of the units and should typically be 10 – 12 in number to ensure a suitable level of detail. Units labelled to the same category in an interview are then assembled or ordered which is easy if done in a word-processing system. The next step in the meaning-making method is to look for patterns in the data and ask why these patterns occur. Explanations to this could be found in the theoretical frame chosen for analysis.

For this process, we made use of the existing definition of sustainable development and let the three pillars economic development, social development, and environmental protection constitute one category each and added a fourth for the pillar culture diversity or others. These categories covered the knowledge parameter in the KVP model, see Table 1. The choice of the fourth category we based on the assumption that the fourth pillar is not so well recognized and that a category was needed to collect also other views of sustainable development. This part of the analyses is to be seen as a directed content analysis (Hsieh & Shannon, 2005).

Besides the four categories for knowledge, seven more categories were found based on a conventional content analysis (Hsieh & Shannon, 2005), see Table 1. Five categories were identified for the value parameter and two for the practice parameter. Finally eleven categories were used for the analysis.

Table 1. The 11 categories used and generated in the analysis.

Parameters in the KVP model (applied analysis model)	Categories
Knowledge (directed content analysis):	Conception of SD in connection to:
	1. economic development
	2. social development
	3. environmental protection
	4. culture diversity or others
Value (conventional content analysis):	5. The commission to teach SD, given outside/above the local school
	6. The local commission to teach SD
	7. How I receive my commission to teach SD
	8.Why sustainable development is important to teach
	9. My choice of content for teaching SD
Social practice (conventional content analysis)	10. How I generally teach and collaborate
	11. How I teach SD

5.2. Authenticity, reliability and validity

The authenticity and plausibility of the data must be considered, especially for interpretive research methods (Walsham, 2006) as well as the preunderstanding of both the researcher and readers of the study. For this study there is no indication or reason to believe that the answers from the teachers were not genuine. They all volunteered to talk about sustainable development as a theme in their teaching and also gave examples from their own conviction and reality.

The validity of the categorisation and the reliability of the analysis were investigated by letting one of the other researchers apply the category system to a set of three of the interviews. The number of meaning units where the researcher agreed was then compared to the total number of categorized units in the three interviews to find the consensus estimate. For 87 of 98 meaning units the researchers agreed resulting in an 89 percent interrater agreement. As a guideline such an interrater agreement should be 70 percent or higher for acceptance (Stemler, 2004).

6. Results

6.1. The knowledge parameter

The four categories used to cover the knowledge parameter fitted well. All knowledge statements could be sorted to the established categories. No teacher specifically mentioned the fourth pillar, being culture diversity. A spectrum among the teachers regarding knowledge of SD was visible. In one end of the spectrum there were some teachers with a rather clear and complete view of SD. In the middle of the spectrum there were a large group where especially the social dimension was diminishing but the ecological and economical dimension still were present. In the other end of the spectrum we found a couple of teachers that only recognize the economical dimension or had some definition of their own. To demonstrate this spectrum some typical answers are presented from four different teachers to the question "If you were to describe SD for someone you know not is familiar with the subject, how would you define it?":

"Yes, human resources, ecological resources and economical resources. It is not only environment, but includes everything and is very complex"

"All questions regarding chemicals in nature, questions about understanding how the ecological system functions"

"We have [the resources] what we have, when it ends, it ends"

"Classrooms rules is what I see as a part of SD, …to get as much as possible out of the day, to cope with oneself" (and later) "I cannot even define SD"

6.2. The value parameter

Five categories were generated covering the value parameter in relation to teaching sustainable development, see Table 1. They could be regarded as a description of value on different levels. One was a political level, described by steering documents, such as curricula and syllabi, containing descriptions of the political objective connected to knowledge to be presented within the school system. There was also a category for the system of values described on a local school level, in a school district or a specific school. This system could be in the form of a written document or an oral agreement, known and respected by all teachers of a school. A third level was an individual one, how I as a teacher receive my commission to teach sustainable development or if this aspect was absent how I personally form such a commission. Besides this we found two more categories. One was a personal conviction of what matters; that a person believes that sustainable development is of importance and must be included in teaching. The fifth category described the selection of content I make as teacher when teaching sustainable development.

From the interviews many similarities among the teachers appeared. They were all aware of that the steering documents mention SD, pointing out its importance. In the interview situation they could not always be exact in the description of where or how the commission is formulated, in the curriculum or in the syllabi for different subjects, as a program goal, a grading criterion or on a more general plane. In some cases the Minister of Education or Agency of Education was described as the one giving the commission which is not wrong even if formal steering documents are the written source.

In some cases the teachers described the commission as unclear on a higher level while other teachers were very clear about the commission given in their syllabi, typically in natural science and especially biology. A trend here was that teachers that have a definition of SD in agreement with Brundtland more often regarded the commission from the steering documents to teach SD as clear, while teachers with a narrower or a personal definition found it more unclear. Two examples of these teachers are:

Question: "Where is it described what to teach about SD?"

Teacher 1:"I don't think I have seen the word SD described [in the steering documents], but the text is about processes: globalization process, democratization process"

Question: How is the commission describing that you as a teacher have to teach SD?

Teacher 2: "The commission to teach SD is not clear…when you have to work with something but you have not been given the tools, how can you do it?"

The teachers were unanimous that it is unclear on a local level, within the school, what commission one has to teach SD. There is no common planning or other activities to secure the teaching of SD on the local plane. But at the same time they stated that it is everyone's duty to teach SD and there is also a common opinion that SD can be taught in most, if not all, subjects.

There was a strong belief among all interviewed teachers that teaching for SD is of great importance for the pupils. They all described that they as teachers have a personal commission to teach SD, whether it is given from the school management or not.

6.3. The social practice parameter

The social practice parameter was described by two generated categories, see Table 1. One category described how a teacher generally teaches and collaborates with colleagues at school which could include how sustainable development is taught. The contents here fell along an axis where the teachers work together as a team with good insight into the colleagues' teaching practice and content of teaching in one end of the axis and teaching alone without interaction or collaboration with other teachers on the one end. The second category described the

interviewed teacher's own practice when teaching, especially sustainable development. Besides choice of content we could here also find how pedagogical tools were included in the teaching such as choice of text books, use of Information and Communication Technology (ICT), artefacts used (movies or newspapers as examples) and teaching methods applied: lecturing, group work and so forth. Sometimes also the teacher's motive for the choice of practice could appear.

To some extent the categories also connected to the other parameters. For example, the category "Why sustainable development is important to teach", belonging to "Value" also gave information of the teachers' knowledge of the conception sustainable development. This is consistent with the KVP model which states that the studied conception can be analysed in terms of interactions between the three dimensions.

7. Discussion

To some extent our results coincide with earlier reported findings. The interviewed teachers in our investigation presented definitions of SD that often were grounded in their own believes which also influenced how they valued teaching for SD and made content choice. This is in concordance with the results of Sund and Wickman (2008) and our result was not found to be bounded to the teaching of a specific subject.

Within the knowledge parameter of the KVP model we found that some of the teachers describe sustainable development as containing all the three pillars commonly regarded as constituting sustainable development. This appeared both in their definitions of sustainable development and in their descriptions why sustainable development is of importance for the pupils to learn about. In their descriptions of teaching they used examples reflecting all three pillars.

Among these teachers we also found those who thought the commission to teach SD is rather clear in the steering documents. This group also includes those who presented the most varied teaching, in terms of using different pedagogical tools and also cooperating in teams of teachers.

As an opposite we found some teachers that had a narrow definition of SD, found the commission unclear in at least some of the steering documents and who taught alone, sometimes only guided by a textbook of unreflected choice. Thus, the positioning for the knowledge parameters seems to some extent to be correlated to the social practice parameter. The positioning regarding the knowledge parameter appears not to be bound to the teaching subject for the teachers in this investigation in opposite to the results in the investigation of Borg et al (2013). Our opinion is that a wider investigation might reveal an existence of different collective representations regarding teaching for SD in the Swedish upper secondary school and perhaps also a common causation for this.

Our results make visible not only a need for further training in SD for teachers as Borg et al (2013) found but also a request for educational tools for teaching SD, preferably distributed thorough the National Agency for Education. But examples of such tools can also be found through literature reviews (Burmeister & Eilks, 2012).

8. Conclusions and implications

A conclusion from the results is that the KVP model is suitable for analysing teachers' views on and teaching of SD. Since this study only includes 11 interviews from two schools a more extended investigation might be able to reveal collective representations related to knowledge and teaching practice, of interest to compare with the results of Borg et al. (2013).

The differences in content knowledge of SD between the teachers in combination with a weak local management regarding SD generate a fundamental problem. Depending on the teachers' own definition and content choice the pupils may get different content knowledge, perhaps not even consistent with the recognized definition of SD. The Swedish school cannot be said to give the pupils an equal education in SD.

The implication is that the local management, personalized in the principal, must take a greater responsibility for the teaching of SD. This includes a common planning procedure at the school that involves all subjects and teachers but perhaps to different extent. There is also a need of an evaluation at this level so secure that the pupils are given the planed education. But it is also obvious that a stronger support than today is needed from the National Agency for Education to present how such a planning procedure can be conducted and provide tools and support also for the

teachers. This is asked for by the interviewed teachers. They stated that they are to some extent given a commission but no support related to how this commission should or can be carried out. Until this gap is filled, Sweden will continue to face a situation where the strong political objective of teaching for SD is conducted with inequality between classrooms.

Acknowledgements

References

Borg, C., Gericke, N., Höglund, H.-O., & Bergman, E. (2013). Subject- and experience-bound differences in teachers' conceptual understanding of sustainable development. *Environmental Education Research*(ahead-of-print), 1-26.

Brundtland, G. H. (1987). *Report of the World Commission on environment and development:"Our common future."*: United Nations.

Bryman, A. (2012). *Social research methods*: OUP Oxford.

Burmeister, M., & Eilks, I. (2012). An example of learning about plastics and their evaluation as a contribution to Education for Sustainable Development in secondary school chemistry teaching. *Chemistry Education Research and Practice, 13*(2), 93-102.

Burnard, P. (1994). Searching for meaning: a method of analysing interview transcripts with a personal computer. *Nurse Education Today, 14*(2), 111-117.

Clément, P. (1994). Représentations, conceptions, connaissances. *Conceptions et connaissances*, 15-45.

Clément, P. (2006). Didactic transposition and KVP Model: Conceptions as interactions between scientific knowledge, values and social practices. *ESERA Summer School*, 9-18.

Clément, P. (2010). Conceptions, représentations sociales et modèle KVP. *Conceptions, social representations and KVP model), Skholê (Univ. De Provence, IUFM), 16*, 55-70.

Engström, S., Gustafsson, P., & Svenson, A. (2012). Education for sustainable development and the relation to learning for entrepreneurship in the national technology program in the Swedish upper secondary school – is it a "happy couple"? *Paper presented at the IOSTE XV International Symposium, Yasmine Hammamet, Tunisia.*

Hattie, J. (2008). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*: Routledge.

Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 15*(9), 1277-1288.

Moscovici, S. (1984). The phenomenon of social representations. *Social Representations, 3*, 69.

Regeringen (2006). *Strategic Challenges – A Further Elaboration of the Swedish Strategy for Sustainable Development*. Retrieved from http://www.government.se/content/1/c6/07/01/83/1a9ae133.pdf.

SFS (1974). *Kungörelse (1974:152) om beslutad ny regeringsform (The Instrument of Government, amendments included up until SFS 2010:1408)*.

Skolverket. (2011). *Läroplan, examensmål och gymnasiegemensamma ämnen för gymnasieskola 2011 (Curriculum, degree objectives and upper secondary school subjects for secondary school 2011)*. Retrieved from http://www.skolverket.se/om-skolverket/visa-enskild-publikation?_xurl_=http%3A%2F%2Fwww5.skolverket.se%2Fwtpub%2Fws%2Fskolbok%2Fwpubext%2Ftrycksak%2FBlob%2Fpdf2705.pdf%3Fk%3D2705.

Skolverket. (2014). Hållbar utveckling (Sustainable development). Retrieved 2014-03-24, from http://www.skolverket.se/skolutveckling/miljo-och-halsa/hallbar-utveckling

SOU (2004). *Statens Offentliga Utredningar (Swedish Official Report). Att lära för hållbar utveckling. Betänkande av kommittén för utbildning för hållbar utveckling (Committee on education for sustainable development). Summary in English.* Retrieved from http://www.government.se/content/1/c6/03/41/44/0fe2bc94.pdf.

Stemler, S. E. (2004). A Comparison of Consensus, Consistency, and Measurement Approaches to Estimating Interrater Reliability. *Practical Assessment, Research & Evaluation, 9*(4). Retrieved from http://PAREonline.net/getvn.asp?v=9&n=4

Sund, P., & Wickman, P. O. (2008). Teachers' objects of responsibility: something to care about in education for sustainable development? *Environmental Education Research, 14*(2), 145-163.

UCLG (2010). *Culture: Fourth Pillar of Sustainable Development (United Cities and Local Governments)*. Retrieved from http://www.cities-localgovernments.org/upload/doc_publications/9890675406_(EN)_culture_fourth_pillar_sustainable_development_eng.pdf.

UN (2005). *World Summit Outcome*. Retrieved from http://www.un.org/womenwatch/ods/A-RES-60-1-E.pdf.

Walsham, G. (2006). Doing interpretive research. *European Journal of Information Systems, 15*, 320-330.