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How Home Economics Teachers in Norwegian Lower Secondary Schools Implement Sustainability in their Teaching?

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Abstract. Sustainability is an aim in the curriculum for Home Economics and the concept should be familiar to teachers of the subject. The objective of this study was to investigate how Home Economics teachers in lower secondary school implement sustainability in their teaching. Secondary school teachers (n= 30) were interviewed about teaching sustainability in their schools. The teachers carried out some degree of theoretical teaching about sustainable development. In the course of practical cookery lessons, their focus on the sustainability of resources was minimal. Although several teachers wanted to buy more sustainable products, the budget did not allow it. The majority of teachers exhibited a relatively low degree of awareness pertaining to the concept of sustainable food production. Practical application of this concept was most probably neglected in Home Economics for economic reasons.

Keywords: Sustainability, Home Economics, teaching, secondary school.

Introduction

In the Western world, everyday consumption of the Earth's natural resources exceeds the rate at which these resources can be renewed. Production within the food sector is responsible for a substantial part of our greenhouse gas emissions. In 2002, the United Nations declared that, during the decade 2005-2014, schools and higher education institutions should directly focus on the promotion of sustainable development (Ministry of Foreign Affairs, 2002) In 2006, the concept of sustainable development was incorporated into the aims of the primary and secondary school curriculum in the subject area of Home Economics in Norway (Ministry of Education, 2006) The greater diversity of foodstuffs available on the market requires an increasing awareness, on the part of the consumer, regarding insight into whether or not various foods are produced in a sustainable manner. Pupils in the Norwegian school systems should be provided with more knowledge in this area, through the subject of Home Economics, with the aim of encouraging them to make more sustainable (educated) decisions, which will be reflected in the choice of foodstuffs that facilitate the renewal of the Earth's natural resources (Joa, 2011).

In the curriculum plan for Home Economics, sustainable consumption is mainly covered in the theme, "Food and Consumption" (Ministry of Education, 2006). The pupils learn about a critical and responsible lifestyle, showing consideration for people and the environment. They should develop consumer competence so that they can make choices with awareness of what will benefit both their health and the

environment. One of the competence aims after year seven (7) is to assess, choose and shop with environmental awareness, and after year 10 the pupils should be able to assess and choose foodstuffs based on ethical and sustainable criteria (Ministry of Education, 2006).

In the curriculum for Home Economics instigated in 2006, the focus to a greater extent than previously was on the environment. Home Economics in Norway is a practical subject that has traditionally driven training in line with the socio-cultural learning, where learning through experience is central (Øvrebø, 2008). All competency aims in the curriculum should be reviewed at the end of teaching in Home Economics, but it is up to each teacher to decide how much time it takes to reach each individual competence. How extensively aims were treated, depended on the teachers` ideology on teaching (Pettersen , 2007; Caldwell, 1997).

To achieve these aims in an optimal way, the teacher's confidence and competence in the subject are particularly important in the practical- arts such as Home Economics. This is, because a lot is demanded of the teacher, as practical tasks can be difficult to organize and implement (Report No. 22, 2011). At present, 70 percent of Home Economics teachers in primary schools in Norway lack education in the subject (Olsen, 2010).

In the subject of Home Economics, school management has great significance when it comes to the provision of good equipment and materials, such as food and cleaning supplies (Øvrebø, 2008; Møller, 2009). Some researchers in Norway claim, however, that the subject is not prioritized, and that it lacks the resources to buy both food and textbooks (Olsen, 2010; Øvrebø, 2011). An area that appears to be discouraged, while lacking teaching skills, will probably to a greater extent be a discipline in which the teacher affects the pupil learning outcomes and the teacher's ideological vision will be crucial for what pupils learn (Joa, 2011).

A great many teaching materials for education for sustainable development are available in Norway (Perl, 2011; Kleppang, 2009). The textbook, *Matlyst* (Food and Health for Lower Secondary Schools) contains a chapter about ethical and sustainable food consumption (Ask, Bjerketvedt & Jensen, 2006a). Another textbook, *Takk for Mat* (Food and Health for Lower Secondary Schools), discusses many of the same issues as *Matlyst* (Thommessen, Arsky & Borschenius, 2006).

A study of Home Economics teachers (Job, 2011) in an urban community in eastern Norway have indicated that curriculum in Home Economics was already so extensive that it proved difficult to include explicit teaching in this area. In addition, the majority of the teachers thought that organic food would prove too expensive in relation to the schools' budget for practical cookery lessons. Most teachers carried out some degree of theoretical teaching about sustainable development, but there was significant variation between schools with regard to both the time allotted and the priority given to this area. Most teachers said that in the course of practical cookery lessons, their focus on sustainability of resources was minimal (Joa, 2011).

A sustainable school kitchen within Home Economics classes will primarily pay attention to what is sustainable within the food sector. Sustainability can be operationalized through the following proposed criteria for a sustainable diet:

- Use the minimum power during cooking
- Use organic food
- Use fairly produced goods
- Use local producetion
- Eat low on the food chain, eating more fruits and vegetables and less meat
- Eat seasonal products
- Choose fish from sustainable stocks
- Do not eat more than you need
- Throw away as little as possible
- Use drinking fountains that are drinkable

Furthermore, it will be important to sort all waste, including food waste, and use eco-labeled products (Nymoen, Bere, Haugen, & Meltzer, 2009). To obtain an awareness of these products, the pupils need to gain knowledge and experience in how to run a sustainable school kitchen. One can therefore assume that the teacher's knowledge of sustainability, and the way in which it is practiced in the kitchen, will have an impact on pupils' overall learning outcomes (Øvrebø, 2008). The aim of this study is to investigate how Home Economics teachers in lower secondary schools implement sustainability in their teaching.

Methods

A letter was sent to the principals of 34 secondary schools from all 19 counties in Norway, inviting them to participate in the survey. Of these 34 schools, 30 responded positively to the request, and in-depth interviews were carried out involving 30 Home Economics teachers at 30 of these schools.

Table 1 Sample Characteristics

Variables	N= 30	%
Area/Province		
North Norway	**8**	**26.7**
Middle of Norway	**8**	**26.7**
South Norway	**7**	**23.3**
West Norway	**7**	**23.3**
Urban/rural		
Urban	**16**	**53.3**
Rural	**14**	**46.7**
Gender		
Women	**25**	**83.3**
Men	**5**	**16.7**
Years of teaching		
1-4 years	**6**	**20.0**
5-10 years	**8**	**26.6**
11-15 years	**10**	**33.3**
16-20 years	**4**	**13.3**
21 years and more	**2**	**6.6**

Characteristics of the respondents (n= 30) are presented in Table 1. The responses came from all four Norwegian provinces. Responses from urban and rural areas were equal in number (Table1). Approximatly half (53.2%) of the respondents had been teaching for over 11years and the other half for between one and 11 years (Table 1). Chi-square analysis revealed no statistical difference between years of teaching in rural and urban areas or in the provinces.

In this study, two Home Economics teachers at two of the schools in the municipality were used in the pilot test. The aim of the test was to determine how the interview guide worked. After pilot testing the interview guide, the information was reviewed in consultation with the pilot informants. The interview guide was semi-structured, with the main questions being formulated. It was possible to change the order in which the questions were posed, and there was allowance made for the spontaneous formulation of follow-up questions. The study was in accordance with the requirements of the Privacy Ombudsman for Research at the Norwegian Social Science Services.

Table 2 shows the interview guide with questions that informants did. Subsequent questions are not shown here.

Planning for Home Economics hours.
Can you tell how you plan what to be made in Home Economics class?
What do you mean about the term "sustainability" in Home Economics?
What do you think when I say a sustainable diet in relation to food and health?
How are you teaching in skills aims on ethical and sustainability criteria?
How being students taught in competency aims of Sustainability? How do you practice sustainability in the schoolkitchen?
Are sustainable and ethical criteria in the teaching of Home Economics important to you?
Do you spend long time on this competency aim in relation to the other aims?
Background for teaching in Home Economics.
Education Number of years as a Home Economics teacher

The interviews were conducted in the winter of 2013. They took place during teachers' working day, and each of the interviews lasted 30 minutes. All teachers were informed about the purpose of the study and that they could stop the interview at any point without giving a reason. Written informed consent and an agreement that quotes from the interviews could be used anonymously were obtained from all teachers. All interviews are included in the analysis. In the process of analyzing the interviews, a branded Apple iPod was used as a recording machine. Each interview was transcribed on the day it was made, to ensure a description of the context of implementation. Respondents were also informed that they could speak freely and that follow-up questions would be asked if necessary. Follow-up questions were usually asked to keep the interview on track in terms of obtaining answers to research questions and issues. The experience "came-into–language" in an open and transformative dialogue between the interviewer and interviewee. The researcher made an effort not to affect the dialogue`s outcome according to her own perceptions and experiences, but to allow the response of the interviewee to emerge. The respondents were relaxed, inspired by the questions, and capable of talking about their teaching about sustainability in Home Economics. In the presentation of the results, key points from the analysis are pointed out. In the interests of anonymity, respondents are referred to as Teacher 1, Teacher 2 etc.

Data analysis

All 30 interviews were transcribed verbatim. The transcribed data were read through several times and a coding frame for the analysis was developed. The analysis was performed as a phenomenological process with systematic text condensation inspired by Giorgi (1985) and (Malterud 2003) and meaning condensation (Kvale 1996). The analysis followed four steps: a) Reading all the material to get an overall impression, b) identifying units of meaning representing different experiences and coding these units, c) condensing and summarizing the contents of the coded groups, and d) generalizing descriptions and concepts. Quotes from the interviews were translated from Norwegian to English by the author in the process of writing this article.

Results

The following will be addressed in this section: What the term 'sustainability' means to teachers, teachers' attitudes to sustainability, teaching pupils to achieve the competence aim of sustainability, theoretical approaches to sustainability, sustainability in practical work in the school kitchen and energy use and reuse.

What the term 'sustainability' means to teachers

None of the teachers expressed the same definition of sustainability, but many presented exemplary perceptions of the concept of sustainability. Most frequently mentioned was "local food". "Low on the food chain", "organic" and "fair trade" were also among the phrases mentioned, as the following quotation shows:

I think fair trade and organic food. (Teacher 1)

A few (3) teachers, however, had no specific, subject-related perceptions of the concept of sustainability.

Sustainability, I wonder about it. One of the most difficult competence aims. I have not dwelled on it-very much. I have no sustainability plan for the pupils. (Teacher 2)

Teachers' attitudes to sustainability
One third of the teachers believed that practicing sustainability in the kitchen may make pupils more confident.

It is important that pupils learn to practice sustainability. We made a vegetable wok, where we used organic and ethically sourced foods. (Teacher 30)

Some of the teachers emphasized that, in order to become competent consumers, it is not enough to hear about it, you have to do it. Half of the teachers indicated that they had a personal interest in sustainability and want to practice sustainability in the kitchen. Two thirds of the teachers indicated that sustainability should be included in the teaching of Home Economics, but it was still not significantly stressed when it came down to it:

We make very little use of it, because we have to think about economics. (Teacher 20)
Two-thirds of the teachers expressed the opinion that sustainable actions are carried out in the classroom, but only because it is required by the curriculum, not because the teachers have a special desire to prioritize the teaching of this subject.

Cooking and nutrition are favored, but sustainability is in the curriculum and should perhaps have been embedded in the lessons. The pupils we get from primary level, are much less knowledgeable than previous pupils on nutrition in general. (Teacher 11)

Most teachers think that the curriculum in Home Economics is comprehensive and that many pupils lack knowledge when they come to the Home Economics lessons in lower secondary schools. The majority of teachers believe, therefore, that there is little time for sustainability because a lot needs to be repeated, and practical cooking takes priority over theory. In addition, nutrition takes priority over sustainability in the number of hours allocated. Many also believe that the number of hours is too low in relation to the curriculum's scope.
One third of the teachers said that the sustainability concept is not something they have given much thought to as they have been teaching Home Economics:

It is a competence aim that is not subject to any importance. In relation to the number of hours, we would have to cut out some competence aims. (Teacher 10)

Theoretical approach to sustainability
Most teachers used theory lessons for this subject. Energy use and reuse was also taken up by many teachers without sustainability being the target of the practical lessons in the kitchen. Of the 30 schools, 25 have some kind of theoretical teaching about sustainability. Within the "some" teaching, there is great variation in terms of how much time is spent on it. Some mention sustainability in the context of checking the "labeling" of food, while others have a session of about two hours on the topic.

We've been on the subject of local food and what kind of food is being made in different parts of the world. Pupils had homework, in which they used textbooks that address the sustainability theme.(Teacher 25)

Sustainability in practical work in the school kitchen
Most of the teachers say that it is too expensive to implement sustainability in the school kitchen: the procurement budget is too tight.

It is a pity that we cannot use organic food and fair trade products, but the budget decides. We do not buy groceries from a basis of sustainability. Almost always it is lowest price. The pupils themselves are very aware of lowest price. (Teacher 27)

Some teachers weave sustainability into something called "home day". Pupils have one "home day" a year during their schooling.

We take up this issue when the pupils have home day. We merge this theme in the tasks pupils have in their home day. Home day is a day when pupils are at home and make a three-course dinner with appetizer, main course and dessert. The pupils can buy organic foods because it's the parents who pay for the food. (Teacher 28)

Each of the 30 schools that the 30 teachers represent say that they do not have the finances to buy organic or fair trade products for Home Economics classes, but two of the teachers say that they try some products once to show the pupils some of these goods.

Much of the time in the school kitchen is spent on cooking; techniques and nutritious food are central. (Teacher 22)

The topic of local and long distance food is usually tackled theoretically in Home Economics. Only three of the teachers say that they are conscious of using local food if the price is almost the same.

We talk about choosing local produce in relation to what eggs to buy. A farm near here sells eggs, but we do not buy eggs from there because it's too expensive. (Teacher 5)

Several teachers want to buy Norwegian local products and look for those in the stores, but this happens in the autumn when it's time for Norwegian vegetables. All schools in the study say they buy food according to the season. The reasons for using the vegetables in the fall were commonly explained by nutrition and economics. Here is a sample:

We use food according to the season. We follow the seasons. We begin the year with the autumn harvest because we have vegetable wok. (Teacher 11)

Most of those interviewed were of the opinion that there was no dish which they ate which was low on the food chain, with the exception of vegetables in autumn.

"Low on the food chain" is not something that we think of when we teach Home Economics. We do not think that some kind of meat is more sustainable than others, we must think about economics. The same applies to the fish. (Teacher 14)

Beef is the most used type of meat, with chicken mentioned as the second most popular. Many of the teachers reasoned that chicken was chosen because they had Muslims in the class, and, for that reason, they could not use pork in cooking.
When it comes to fish they use cod and saithe.

We have fish in the winter when the fishing is at its best. We teach pupils to make fish burgers of haddock, saithe and cod. We do not think about sustainability, but what fish is best for making a fish burger. (Teacher 18)

Energy use and reuse
Many teachers were aware of the extent to which they used water and electricity.

Washing under running water is not necessary. We use cold water to pre-rinse and soapy water when we were in hot water. Then we have a stopper in the sink. Pupils are not allowed to leave the hot water to run. (Teacher 21)

There is great awareness about the use of water and electricity, but none of the teachers related this to sustainability. To the extent that it was explained, it was in relation to the economy, hygiene or that it was "learned" that this is the way we do it.

The pot must match the electric ring size. If you have a small pot, then also use a small ring, which we emphasize in teaching and turn the oven, so it does not appear on any longer than necessary. In addition, we use a small amount of water when we cook eggs and potatoes. This has to do with economics. (Teacher 23)

When it comes to leftovers, the teachers are good at calculating the portion sizes and how much should be brought in for each lesson. Experience and time spent on it will also be important for precise purchases.

Nothing goes in the garbage. The remains of food are packed up and put in the freezer. The residue of milk is frozen and may be used in baking. The remains of pre-cooked food are passed down to the teachers in the staffroom or the pupils take leftovers home with them. (Teacher 22)

There was not one of the teachers that had a lesson dealing with the leftovers.

We always take care of the leftovers. We do not have any particular lesson dealing with leftovers, but maybe we should have. (Teacher 12)

A number of teachers instruct pupils that foods can be used for several dishes and not discarded. This can be illustrated as follows:

We teach pupils to buy what we need, not large quantities to be disposed of. Pupils receive training in portion sizes. We also teach pupils that they can make different meals from a pack of fishballs. (Teacher 13)

Many municipalities offer recycling of paper for schools. Of those surveyed, two thirds of teachers said that they did not sort or even collate paper, while one third of the teachers explained that they had recycling where waste was included.

At this school we have recycling of glass, plastic and food waste. It's nice that the pupils get to practice this in Home Economics. (Teacher 15)

After a review of all interview data, a picture can be drawn, which I summarize in the following. Most of the teachers came with examples of associated perceptions to explain the concept of sustainability. Their attitudes to sustainability ranged from thinking that it was very important to teach it, to believing that the secondary aims in

the curriculum were far more important, and therefore they did little or no teaching on this. Many teachers have some kind of theoretical training about sustainability. However, this is not practiced to any great extent in the school kitchen because it is too expensive for the procurement budget.

A number of sustainability initiatives have been made in the Home Economics-discipline, especially when it comes to using vegetables in the fall, eating low on the food chain, using of water and electricity, and the utilizing leftovers. There are many who cannot communicate to pupils, or who do not have a focus on, these sustainability initiatives. When it comes to using local food, some try to practice this. No one mentioned what kinds of fish and meat are sustainable.

Discussion

Sustainability is an aim in the curriculum for Home Economics and the concept should be familiar to teachers of the subject. In addition, there are two textbooks in lower secondary schools which define the term 'sustainability' (Ask, Bjerketvedt & Jensen, 2006a; Thommessen, Arsky & Borschenius, 2006). These are good teaching materials available to teachers. Many schools in Norway have not secured these textbooks, because they are using a free book that do not define the term 'sustainability'. Despite the fact that most teachers had training in the subject of Home Economics, it did not impact on what they could do about sustainability or how much time they spent on the topic, which suggests that the issue may also have an ideological dimension. Previous studies show that however "green" a teacher is ideologically is consistent with how much time he or she spend on sustainability in their teaching (Raabs, 2010).

For all teachers, sustainability was implemented as block tuition (at a maximum of half a day per year) instead of it becoming a recurring theme in the classroom, even though they said that this topic was important to them. This is consistent with previous studies (Haapala, Biggs, Cederberg & Kosonen, 2012; Joa, 2011). Sustainability is a part of the learning outcomes when teachers write their syllabus in the beginning of the term. Several hours should have been dedicated to that topic. None of the schools organized so-called environmental days, where food had a central place. According to Gough (2005), sustainable measures in which the whole school is involved will have a greater impact on student learning. Many teachers had some kind of theoretical teaching about sustainability: however, this is not practiced to any great extent in the school kitchen. As justification for this, the teachers say that it is too expensive to implement sustainability in the school kitchen: the procurement budget is too tight. This is consistent with previous studies (Aarek & Ask, 2012; Joa, 2011).

In some schools, an attempt is made to have some practical teaching on this, with lessons on sustainable development. Teachers then argue that they use foods low on the food chain or they buy organic products. Local produce is too expensive for the procurement budget. Several teachers introduce the theme of sustainability in the autumn, so that they can use the associated seasonal vegetables. Sustainability has a certain timeslot in the school kitchen in the autumn but is rarely practiced during the rest of the year.

In practical cooking, a very small number use organic food and "fair trade" products. Regarding the nutritional content of organic foods, there are currently no good controlled studies that confirm that these foods are more beneficial to health than conventional foods (Holmboe- Ottesen, 2004). On the other hand, an organic diet is

considered to be less energy- intensive than a conventional diet. When purchasing "fair trade" products, consumers should in principle be assured that the workers who produce these products work under decent conditions; this is something that is perceived by consumers as the "right" thing to do (Milford; 2009).

When it comes to selecting the meat and fish species that teachers use in cooking, these are not associated with sustainability. Many teachers justify the choice of fish and meat types with economic limitations. It may also be that there are Muslims in the class. Beef is the meat product that is used most in Norway, while cod is the most commonly used fish. Public nutrition consultations in Norway want to reduce red meat and recommend that the diet is mainly based on fish, fruit, vegetables and whole grain products, which is considered to be a sustainable diet (Directorate of Health, 2011).

Several factors may affect whether sustainability is woven into teaching or not. Pupils beginning lower secondary school has currently less knowledge in Home Economics than previous pupils. Many secondary teachers see this lack of training in the pupils and teach techniques and nutrition rather than sustainability. There are currently no textbooks in Home Economics at the primary level. A Norwegian website called The Natural Rucksack is focusing on nature, environment and sustainable development in the primary education. The website is meant as resource base for teachers. Many primary school teachers do not have education in Home Economics. Home Economics in Norway has had little attention and low status (Husjord, 2001; Øvrebø, 2008).

Another aspect of sustainability, and whether or not it is executed, is the scope of the curriculum in Home Economics. Most teachers find that the curriculum in Home Economics in Norway is too extensive and that it is difficult to get through the entire plan during a school year. When a subject is too wide to cover in a term, teachers usually pay attention to learning outcomes or objectives of the class, but sustainability is not part of those. Many teachers do not consider sustainability to be as important as the other subjects in Home Economics. The socio-cultural learning system has always been strong in the teaching of Home Economics (Øvrebø, 2011; Holthe, 2009). When several teachers believe that basic techniques are more important than whether the fish has traveled a long or short distance, this tells something about the informant's ideological views on sustainability (Pettersen, 2007; Caldwell, 1997). The teacher's own personal attitude towards sustainability is likely to be picked up by the students and may then affect their attitude to the subject (Joa, 2011; Raabs, 2010). Teachers need not only to teach sustainability, but also to be seen to practice it if they are to educate competent and thoughtful consumers.

In addition to the curriculum, the teachers and principals' ideological vision most likely put their stamp on education in classrooms (Møller, 2009; Solheim, 2009; Øvrebø, 2008). The majority of teachers believed that, in order to consistently implement sustainable ideology in Home Economics, there is a need for more facilitation by governing agencies. In practical Home Economics, teachers were forced to buy the cheapest products. There were several teachers who had wanted to buy more sustainable products, but the budget did not allow it.

Care in the use of energy use and leftovers is evident throughout the year in many schools. This is consistent with the results from another study (Joa,2011), but no teachers mentioned these conservation measures specifically as sustainability measures. Teachers are careful with the use of electricity and water in the school

kitchen and take care of the leftovers. They have their own rules for this, as pupils must learn. Saving water and electricity is something we have been focusing on since Home Economics was introduced in schools. At that time, however, the motivation was probably far more related to economy than to sustainability (Øvrebø, 2008). During and after the interviews, there were factors that could affect the study's validity. There was considerable work on the questions in the interview guide in advance, while follow-up questions were devised as the interview progressed. To a greater extent than the questions in the interview guide, follow-up questions could have influenced the informants' statements, as these questions were posed more spontaneously. The researcher`s understanding will not only affect the interview situation, but also the other parts of the project, from the selection of the problem to the finished result. After all the interviews were completed, the researcher had extensive material to be processed and analyzed, which could possibly have made the analysis less clear and thus weakened the reliability. In the analysis phase, it may be an advantage when more people are involved in the work (Knizek, 1998).

Conclusion

A teacher`s approach to sustainability can affect the next generations of attitudes and practices in relation to this concept. The majority of interviewees in the study exhibited a relatively low degree of awareness pertaining to the concept of sustainable food production. Most of the education provided on sustainability seems to be theoretical. The practical application of this concept was most probably neglected in the Home Economics syllabus. Governing bodies should be on track with initiatives that support sustainability in Home Economics. Therefore, a shift in emphasis in the Home Economics curriculum is required, in order to accommodate the need for education in the practice of sustainable development in food production. Not only in the curriculum, but in the syllabus of the subject itself so it can homogeneous throughout the schools. Learning outcomes and objectives are essential. The teachers may feel that they do not have relevant knowledge in this area, and, when it comes to foodstuffs for practical teaching, they may be forced by the school`s budget to buy the cheapest option.

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