

Will a sustainable lifestyle fit as a part of special education?

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ISSN: 2243-7703
Online ISSN: 2243-7711

OPEN ACCESS

Received: 11 January 2016

Revised: 7 February 2016

Accepted: 9 March 2016

Available Online: 26 March 2016

DOI: 10.5861/ijrse.2016.1413

Abstract

In Finland, environmental education is a part of the national core curriculum of basic education. It aims at raising children into citizens who are committed to a sustainable lifestyle and motivated to act for the environmental and human well-being. The purpose of this research was to study how the themes of sustainable lifestyle added in teaching influence students' attitudes toward sustainable development and lifestyle. The study was an action research in which 16 ninth-graders, who study in a special education classroom, participated. The research data comprised the initial and final measurement and the five-week-long teaching period that included lessons introducing the sustainable lifestyle, morning opening speeches, and small theme projects. During the study, a teaching experiment was created and it served as a model of how to include themes of sustainable lifestyle in education as a cross-curricula theme. Based on the findings, the teaching period enhanced students' awareness of the concept of sustainable lifestyle although their appreciation of some sustainable lifestyle areas increased and some decreased. The study showed how challenging it is to aim at enhancing students' appreciation of sustainable lifestyles through learning contents of sustainable development and environmental education in special education. The most functional teaching methods were interactional and communal activities.

Keywords: environmental education; sustainable development; teaching experiment; special education; sustainable lifestyle; sustainability

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1. Introduction

Nature and environment have been given various roles across time, place, and culture (Bengtsson & Östman, 2013). In our current welfare society, nature is primarily seen as a source of resources. Environmental attitudes are culturally learned through upbringing and education (Bonnett, 1999). Environmental education aims at changing people's attitudes and enhancing the adoption of sustainable lifestyle (Venkataraman, 2009). The Finnish national core curriculum of basic education outlines the emphases and basic values that education should follow. One of the themes in the effective national core curriculum is responsibility for the environment, well-being, and sustainable future, in other words, environmental education which the term environmental research widely uses (Hungerford, Peyton, & Wilke, 1980; see also Lustyantie, 2015). The goals of curriculum also define the contents of environmental education.

In the Finnish basic education, environmental education is a cross-curricula theme. Therefore, the ways of implementing environmental education can vary considerably. Diversified learning entities that combine several school subjects aim at integrating teaching. This is important especially in special education of children with special needs. Students who suffer from various learning difficulties can find it difficult to piece together fragmented information (e.g., Vaughn & Linan-Thompson, 2003), and therefore, integrated studies can help them to perceive entities and increase the sense of meaningfulness in studies (e.g., Goldman & Hasselbring, 1997).

The purpose of this study is to research how special education students' attitudes to sustainable lifestyle changes through a teaching experiment. A five-week-long teaching period aiming at increasing the ninth-graders' awareness of sustainable lifestyles formed the basis of this action research. Changes in students' attitudes and awareness were measured. The purpose of this article is also to introduce the teaching period and analyze its benefits and challenges as well as its meaningfulness from students' and teachers' perspectives (see also Garrison, Östman, & Håkansson, 2015).

2. The Theoretical Background

2.1 Environmental education

The purpose of environmental is to increase awareness of environmental questions (Fraser, Gupta, & Krasny, 2015) and increase students' understanding about the values, attitudes, information, and skills of nature protection and enhancement, their sustainability (Blewitt, 2005), and their ability to adopt behaviors that support environment (Chawla & Cushing, 2007).

The concept of environment forms the core of environmental education. Literally, environment refers to everything surrounding us. In addition, environment can be defined as an entity which is something separate from human beings or the outside nature (Greider & Garkovich, 1994). Another way of defining environment refers to every human being's personal environment which is under the influence of his or her own action and thinking (Stern, 2000). Thirdly, environment can be seen as a socially and societally produced entity (Barnett & Casper, 2001; Reunamo & Suomela, 2013); Suomela & Tani, 2004; Tani, 2013). Stern's definition is close to the viewpoint of this study.

Environmental education has been described as a life-long process that helps realize environmental questions (Bélanger, 2003). Environmental education is implemented in numerous ways. In Finland, it is not tied within one school subject but is a cross-curricula theme. Having the objectives of environmental education in the national core curriculum has been considered very important (Hungerford, Peyton, & Wilke, 1980). However, it

is clear that the methods and emphases of environmental education depend greatly on teachers' knowledge and motivation (e.g., Ardoin, Clark, & Kelsey, 2013; Garrison, Östman, & Håkansson, 2015; McCaw, 1980).

There are several models and emphases of environmental education (e.g., Morgensen & Schnack, 2010; Kopnina, 2012; Palmer, 2002), and its effectiveness have also been evaluated from numerous points of view (e.g., Ham & Sewing, 1988; Hasslöf & Malmberg, 2015). In addition, one important question of environmental education has focused on how and what kind of environmental education could influence the best the development of environmental sensitivity and responsibility in students (Barratt Hacking, Barratt, & Scott, 2007) and their adaptation of a sustainable lifestyle (Hungerford & Volk, 1990; Kollmuss & Agyeman, 2002). For example, classroom-bound teaching has been criticized by the developers of environmental education (Maynard & Waters, 2007).

The current era challenges environmental education in many ways as basic values and lifestyles (see e.g., Ideland & Malmberg, 2015) and globalization (e.g., Jickling & Wals, 2008) bring new kinds of pressures. Environmental education can influence people's relationships with the nature and sustainable development (Volk & Cheak, 2003), although the effectiveness of environmental education has proven difficult (Robottom, 1989; Stern, Powell, & Hill, 2014). Both individuals and communities should reflect on environmental problems and become convinced that people can—through their own choices—enhance the well-being of environment. Mainly, environmental problems have resulted from people's action (Uzzell, 2000). The foundation of environmental education is based on information and responsible views on what you can do to the nature and how and why it should be done. One of the most central tasks of environmental education is to strengthen a student's personal relationship with the nature so that he or she will understand the significance of a sustainable lifestyle (Bonnett, 2013; Christensen et al., 2007; Green & Somerville, 2014).

2.2 Environmental education as a part of special education

In Finland, students have legal right to receive support for learning and studying during their basic education. The need for special support can be short- or long-term and can vary by its level (The National Core Curriculum for Basic Education, 2014). Basically, there are three levels of support available. The general support is included in general basic education. It can consist of individualized studies, collaboration with other teachers, or reforming of study groups. It is the simplest support method which does not need any separate decisions. The intensified support is more systematic than general support. It is based on a pedagogical evaluation made by teachers, the student and his or her parents or guardians, and the pupil welfare personnel. The intensified support is flexible by its arrangements and can be provided as integrated within general education. The intensified support follows a personal study plan that is made in collaboration with the student and guardians. If these two forms of support are insufficient, the decision of providing special support can be made. Special education follows a plan of arranging personal education. This plan is also made in collaboration with the student and guardians. Teaching can be individualized by the level of studies, by teaching methods, and by learning materials and other forms of support. Supervisors' and assistants' work forms a part of special support. The purpose of providing support is to support learning so that the student may be able to complete basic education.

It is also possible to make learning environments individualized by molding the teaching facilities, increasing the number of various work stations, or teaching outside, in nature. Integrated teaching tries to piece together information from various school subjects into an understandable entity. This covers the whole teaching and learning culture of basic education, but especially, in special education, it can enhance learning (see e.g., Dukes, Darling, & Doan, 2013).

In this study, environmental education represents one form of integrated teaching in special education. Environmental education is connected with almost all school subjects in basic education, and therefore, is a suitable thematic entity to study from this perspective. In addition, those teaching methods that provide children with personal, hands-on experiences and observations about their environment are important (Bonnett, 2013;

Pavlova, 2013). A concrete connection with the nature is as crucial (Ernst & Theimer, 2011; Liefländer, Fröhlich, Bogner, & Schultz, 2013) as concrete doing and practical experiences (Ceaser, 2015). Especially, biology and geography lessons have traditionally included lessons in the field and laboratory, and drama pedagogy and other projects (Morgensen & Schnack, 2010).

There are some previous studies about the significance (Chapman & Pease, 2006; Stavrianos & Spanoudaki, 2015), importance and benefits (Von Benzon, 2010), and challenges (Von Benzon, 2011) of environmental education in special education. Models of implementing environmental education in special education have also been created for special education teachers to apply in their teaching (Boardman et al., 2005; Hall, 2015; Palmer et al., 2006).

3. The Teaching Experiment

The five-week-long teaching period included altogether 40 lessons that covered the following school subjects: math, English, Swedish, biology, PE, religion, Finnish, and social studies. The theme of environmental education was brought up during the lessons of various school subjects and in general school work daily. During the teaching period, the sustainable lifestyle was discussed by focusing on the following emphases: climate change (Bofferding & Kloser, 2015; Monroe, Plate, Adams, & Wojcik, 2015; Stern, 2011), energy saving (Börner, Kalz, & Sprecht, 2014), consuming (Cherian & Jacob, 2012; Manieri et al., 1997), water consumption (Brownlee et al., 2014; Salvaggio, Futrell, Batson, & Brents, 2014), sufficiency of food (Marsden & Smith, 2005; Weitkamp, 2013), and traffic.

During math lessons, students analyzed and devised diagrams of water consumption among other tasks. PE lessons took place outside, and various sports such as Frisbee golf, skiing, and geocaching were implemented so that students' attention focused on the terrain and on nature and forest experiences. During English lessons, students made compostable waste bags out of newspapers following English directions. They also played an English-speaking online game in which the players collect food for those starving. During biology lessons, the class familiarized with the origins and textures of food and environmental factors influencing human genotype. Classroom discussions focused on agents detrimental to human beings and nature and on various types of radiation. Social studies lessons covered topics such as money usage and what kind of influence the media have on consumption. Finnish lessons focused on the Romanticism which was an era in literature that glamorized the nature. For example, students analyzed the description of nature in the Finnish national epic Kalevala and in the works of visual art during the era of Romanticism.

Lessons emphasized dialogue and co-operational activities. Thus, regular tasks also included plenty of group and pair work. Students' observations, measurements, productions as well as opinions and thoughts were widely discussed during the teaching period.

In addition to the actual lessons, the teaching period included projects related to the theme of a sustainable lifestyle. Students were given six themes of which they compiled posters. The themes were food, waste, energy, traffic, consumptions, and water. Posters were compiled at the beginning of the period and the purpose was to complement the posters with texts and pictures during the teaching period. Students also grew garden cress at the classroom windowsill. Each planted cress seeds, water them, and follow the cress grow. At the end of the period, students took an energy saving quiz. It consisted of fifteen questions about energy consumption.

Furthermore, the period included morning openings covering the themes of a sustainable lifestyle. They were held once a week. The themes were selected according to topical issues of the day, and music accompanying the openings also illustrated the theme. The first morning opening was held during the stinginess week, which refers to a Finnish theme week of reasonable consumption. The music choice was "Money" by Pink Floyd. The second morning opening was close to the anniversary of Tshernobyl catastrophe and dealt with energy consumption and wasteful use of electricity, accompanied with Wigwam's "Nuclear Nightclub". The third morning opening was held during the national bicycling week, and the theme was work and school

commuting by bike and its advantages. The music choice was the Queens' "Bicycle Race". The fourth morning opening took place on the international day of the nature's diversity. The theme was related to the significance of a sustainable lifestyle to the protection of biodiversity. Valencia's "Gaia" was chosen as the music for this morning opening.

4. Method

The purpose of this study was to compare the students' attitudes toward a sustainable lifestyle before and after the intervention which was the aforementioned teaching period. Would the teaching experiment in environmental education enhance positive attitudes toward a sustainable lifestyle? The following research questions were set for this study:

- What were the students' attitudes toward a sustainable lifestyle before the teaching period in environmental education?
- What were the students' attitudes toward a sustainable lifestyle after the teaching period in environmental education?

By answering to these questions, the purpose was to investigate the possible change in the students' attitudes. The study was conducted among ninth-graders (N=16; 10 girls and 6 boys) who studied in the special education group. They all had decisions on the arrangement of individualized education and personal study plans. All were also diagnosed with a learning disability, and the group was very heterogeneous when it came to their learning and studying abilities. The school selected in this study is located in Central Finland. It is a rather big school that has a special education class, too. The city has plenty of industry and is located in a scenic area of lakes. Therefore, the themes of environmental education fitted especially well to this school's agenda.

The data collection included two measurements: the initial measurement was done before the teaching period started and the final measurement after the teaching period ended. The students filled out forms that included questions about attitudes toward the nature and a sustainable lifestyle. The forms were designed keeping in mind the students' disabilities and thus, the questions were phrased as simply as possible. The forms of questions were variable so that the students' interest in answering them would remain good. Most of the questions were statements (e.g., "How important is it to recycle?"; "How important is it to use the library?" etc.) that were answered by choosing the most suitable answer from a Likert scale 1–5 (1=Not important at all...4=Very important, and 5=I don't know). In addition, the questionnaire included some open-ended questions, such as "Which school subjects have included education about a sustainable lifestyle?" and "What is the most important thing in a sustainable lifestyle in your opinion?"

The data collected by the initial and final measurements were analyzed by using a statistical analysis software to discover important frequencies and make cross-tabulations. Findings from the initial and final measurements were compared. As the study was conducted among children, special attention was paid in ethicality. Therefore, the background information about the participant is limited as Finland is such a small country that one could relatively easily figure out the school and its special education class in question. However, according to Thomas and O'Kane (1998), the attempt to hear children's voices in a study can increase not only its validity and reliability, but its ethical acceptability as well. Here, the purpose was indeed hear children's own opinions. In addition, children's autonomy and subjectivity were recognized (see also Uusiautti & Määttä, 2013). Naturally, proper permissions were acquired from their parents as well before the intervention period started.

5. Results

5.1 Students' attitudes before the intervention

The initial measurement aimed to measure students' interest in environmental issues before the teaching

period of environmental education started. Less than half of the students were somewhat interested in environmental issues and a rough third were a little interested or not at all interested. The concept of a sustainable lifestyle was familiar to only 12.5 % of the students.

Students' opinions on various parts of a sustainable lifestyle were also inquired. Most of the students (87.5 %) considered recycling and sorting of waste important or very important. Composting was seen important or very important by 69 % of the students. Half of the students thought that it is important to buy used items and fix up old equipment. Half of the students considered saving of water very important. A third thought it is very important to save electricity and 37.5% considered it a little important. Using public transportation was considered somewhat important by a third of the students. Commuting by a bike or walking was very important or quite important according to 81.3 % of the students. 44 % of them saw libraries somewhat important and 37.5 % of them not important at all. Buying organic food was a little important or somewhat important on 37.5 % students' opinions. On the other hand, 37.5 % of the students considered buying Finnish food very important, and a third of them considered it somewhat important. Table 1 summarizes the students' answers.

Table 1

Students' opinions on a sustainable life factors before the intervention

	Not at all important	A little important	Somewhat important	Very important	I don't know
Recycling and sorting of waste	6.3%	6.3%	50.0%	37.5%	0.0%
Composting	12.5%	18.8%	37.5%	31.3%	0.0%
Buying used items	18.8%	12.5%	50.0%	18.8%	0.0%
Fixing old equipment	0.0%	37.5%	50.0%	12.5%	0.0%
Saving of water	12.5%	12.5%	25.0%	50.0%	0.0%
Saving of electricity	12.5%	18.8%	37.5%	31.3%	0.0%
Using public transportation	18.8%	25.0%	31.3%	25.0%	0.0%
Commuting by bicycle or walking	0.0%	12.5%	25.0%	56.3%	6.3%
Using the library	37.5%	6.3%	43.8%	6.3%	6.3%
Buying organic food	12.5%	31.3%	37.5%	12.5%	6.3%
Buying Finnish food	0.0%	31.3%	31.3%	37.5%	0.0%

When students were asked whether teaching about a sustainable lifestyle had made them interested in it, 69 % of them answered "I don't know". While biology and math were named as school subjects where they had had the most teaching about a sustainable lifestyle, almost half of the students could not name any subject that would have had introduced this theme. A fourth of the students were of the opinion that themes related to a sustainable lifestyle should be added in basic education, 44 % of them thought the current amount was suitable, and according to 6.3 % of the students education on a sustainable lifestyle should be lesser.

Of the participants, 69 % did not have any nature-related hobbies. Those who had did fishing, handicrafts, jogging, horseback riding, and photographing. The main sources of receiving information about a sustainable lifestyle outside school were the TV and internet.

5.2 Changes in students' attitudes after the intervention

Next, we will summarize the changes that could be perceived from the comparisons between the initial and final measurements. While in the initial measurement 44 % of the students reported they were somewhat interested in environmental issues, in the final measurement their proportion was only a third. The number of "a little bit interested" had risen from 19 % to 40 %. The proportion of "the very interested" had not changed. The teaching period had not increased the students' interest in environmental issues much.

The students' awareness of the concept of a sustainable lifestyle had risen from 12.5% to a third of them. After the intervention, still a fourth of the students did not know the concept and 40% could not tell whether they know the concept or not. Although the concept of a sustainable lifestyle became somewhat more familiar during

the teaching period, it was surprising that over a half of the students did not consider the concept familiar even after the period has ended. However, the students' interest in environmental issues had risen from 6% to 27%.

Table 2

Students' opinions on a sustainable life factors after the intervention

	Not at all important	A little important	Somewhat important	Very important	I don't know
Recycling and sorting of waste	6.7%	20.0%	40.0%	33.3%	0.0%
Composting	6.7%	26.7%	40.0%	26.7%	0.0%
Buying used items	13.3%	46.7%	26.7%	13.3%	0.0%
Fixing old equipment	20.0%	20.0%	40.0%	13.3%	6.7%
Saving of water	6.7%	6.7%	33.3%	53.3%	0.0%
Saving of electricity	6.7%	6.7%	40.0%	46.7%	0.0%
Using public transportation	20.0%	20.0%	33.3%	26.7%	0.0%
Commuting by bicycle or walking	13.3%	13.3%	40.0%	33.3%	0.0%
Using the library	33.3%	6.7%	53.3%	6.7%	0.0%
Buying organic food	20.0%	13.3%	40.0%	26.7%	0.0%
Buying Finnish food	6.7%	13.3%	33.3%	40.0%	6.7%

Furthermore, changes in the students' opinions on how important they considered life habits that promote a sustainable lifestyle were, were also analyzed. Surprisingly, their evaluations on the importance of waste sorting and recycling as well as buying used items had decreased. Only 77% thought recycling and 40% of them thought buying used items are somewhat important or very important. Similarly, only 60 % of the students considered fixing old equipment is a little or somewhat important. The changes were different when it came to saving of water (86.5%) and electricity (86.5%), as well as using public transportation (60%). The appreciation of these elements of a sustainable lifestyle had risen a few per cents. However, the percentage of students who considered commuting by bike or walking had decreased after the intervention into a third. Appreciation of library services had not changed. Buying organic food and Finnish food were considered slightly more important in the final measurement than it was in the initial measurement.

The percentages of students wanting more teaching about environmental education decreased so that only a fifth of them would have wanted more education and 14 % would have wanted less. The final measurement also inquired whether school projects on a sustainable lifestyle are beneficial. Fifth of the students considered the school's vegetarian meal day (students in Finnish schools have free meals provided by the school), Earth Hour event and related events, and voluntary environment cleaning work. Some activities were considered useless, such as compiling a collection of plants (75%) or bird-watching trips and other trips in the nature (50%). About 40% of the students considered the local food week at school somewhat beneficial or very beneficial.

Table 3

Students' opinions on the benefits and usability of school projects focusing on a sustainable lifestyle

	Not useful	A little useful	Somewhat useful	Very useful	I don't know
The school's vegetarian meal day	26.7%	33.3%	20.0%	20.0%	0.0%
Local food week at the school diner	20.0%	40.0%	26.7%	13.3%	0.0%
Earth Hour Event and alike	6.7%	40.0%	33.3%	20.0%	0.0%
Voluntary environment cleaning	26.7%	20.0%	33.3%	20.0%	0.0%
Trips in the nature	46.7%	26.7%	26.7%	0.0%	0.0%
Bird watching trips	46.7%	26.7%	20.0%	0.0%	6.7%
Compiling a folder of plants	73.3%	20.0%	6.7%	0.0%	0.0%

According to the students' evaluations, teamwork, discussion circles, and studies in the nature were the best methods for teaching about a sustainable lifestyle. Tasks completed with a computer or tablets were reported as the worst methods. On the other hand, almost 50% of the students thought all these methods were somewhat

suitable.

In the end of the questionnaire, the students were asked what they considered the most important thing in a sustainable lifestyle. 60 % of them answered “I don’t know” or did not answer the question. Some of the answers included items mentioned in the questionnaire which is the case in the following student’s answer:

Student no. 1: *to think about the origin of products you purchase and sorting of waste.*

A couple of students had given this question a thought and their answers illustrated merely the ethical choices of basic values that direct people’s action:

Student no. 5: *a considered way of thinking*

Student no. 8: *love*

These answers can be analyzed from the point of view of environmental education so that Student no. 1’s answer refers to increased awareness through pointing out right kinds of action. Student no. 5 shows responsibility over one’s own choices and Student no 8 describes the development of environmental sensibility.

6. Summary and Evaluation of the Study

Based on this study, the integration of environmental education in teaching did not remarkably increase students’ interest in themes related to a sustainable lifestyle. What the study did show was that cross-curricula learning entities can be implemented within special education but it is somewhat challenging. At the beginning of the teaching period, themes of a sustainable lifestyle were added little by little in teaching without emphasizing the contents. Apparently, this increased the students’ interest in the teaching period. Some of the students reported that they anticipated the start of the period and wanted to know more about it. Still, their positive attitudes toward the teaching period did not influence their attitudes toward the themes of a sustainable lifestyle. The contribution of the study lies in its special viewpoint of including environmental education in special education. Furthermore, it brought up the challenge of integrating cross-curricula themes in this type of education.

However, it seems that the initial and final measurements did not provide enough information about the students’ attitudes and their changes, and further and more profound information would have been necessary. For example, the measurements should be complemented by individual interviews where the researcher could have asked additional questions about the students’ answers. It would also have been important know about students’ hobbies and how their nature-related free-time activities were connected to their attitudes toward a sustainable lifestyle. A study by Sumantri and Supendi (2015) also found out that students’ learning styles may have an important role in learning about environmental issues. While the study focused on the students’ attitudes toward a sustainable lifestyle, it could have been directed more on analyzing the students’ opinions on the teaching contents that were integrated in lessons (see also Rickinson, 2001). Especially in special education, the implementation of cross-curricula learning entities is crucial for integrated learning. Simultaneously, teaching can fulfill the values defined in the national core curriculum for basic education that has the emphasis on cooperation between various school subjects and responsibility for the environment and nature. The trend is relevant and topical, and the thought of promoting responsibility is necessary. Due to varied practices, the actual practical implementation can be difficult. Still, our society needs responsible youths and future adults who can respond to the requirements of sustainability (Nakagawa & Payne, 2015). Cooperation between various school subjects may have a central role in this development. Yet, the attitudes must change among teachers, too, and not just in students. Future education must be based on a wider and more versatile collaboration between various agents, on reasonable distribution and use of resources, and activities that show respect to others and the environment (Ardoin, Clark, & Kelsey, 2013).

7. Discussion

Environmental education is just one part of the values defined in the national core curriculum in Finland. Goals related to values and wide-ranging knowledge require time and resources in basic education before they can be achieved. Lack of time in practical teaching work challenges the integration of these kinds of themes in education. New curricula should pay attention to means that makes it possible to expand teaching toward more diversified methods. Attitudinal changes as well as structural changes are required (Stevenson, 2007), if teaching was to expand beyond traditional classrooms and pre-prepared teaching materials (Liddicoat & Krasny, 2014). Environmental education necessitates meticulous, goal-oriented action (Varela-Losada et al., 2015). Experiences in nature and the adoption of a sustainable lifestyle as a personal valuable choice call for teachers' pedagogical expertise and familiarization with students. Pompous teaching about a sustainable lifestyle can even hinder students from internalizing the values of environmental education (Ahsley, 2000).

It would be necessary to systematically include viewpoints and solutions of implementing environmental education in teaching already in teaching training at universities (McKeown-Ice, 2000; Powers, 2004). Moreover, as the study showed in practice, teaching professionals should be aware of the challenges of environmental education and difficulties of changing students' behaviors (Krasny, Kalbacker, Stedman, & Russ, 2015). Still, learning about environmental issues and a sustainable lifestyle should be considered a privilege. Indeed, learning about them concerns everyone, including students in special education (Shakespeare, 2015).

Acknowledgment: This study has the approval of the University of Lapland.

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