Wellbeing in School Gardens

The case of the Gardens for Bellies food and environmental education program

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Published in: Environmental Education Research

DOI: 10.1080/13504622.2018.1434869

Publication date: 2018

Document Version
Post-print: The final version of the article, which has been accepted, amended and reviewed by the publisher, but without the publisher's layout.

Link to publication

Citation for published version (APA):

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Introduction

School gardens as settings for outdoor learning are becoming popular across North America and Europe. In Denmark, the Haver til Maver (Gardens for Bellies) school garden program is a national program spreading across the country offering a setting both for outdoor learning and for environmental and health education. Local municipalities across Denmark and Danish society more generally are increasingly expressing interest in promoting and supporting health, food, and environmental initiatives, an interest that has coincided with the lengthened school day implemented by the 2014 national school reform process and the demand from the Ministry of Education for experiential learning in settings outside the school. These are some of the factors underlying the growth in school gardens in Denmark.

The Gardens for Bellies (GfB) program, initiated in 2006 on a farm located to the north of Copenhagen, received funding to establish twenty new school gardens across Denmark between 2014 and 2017. A small part of this funding was for research, building on an earlier study by Wistoft (2013) on the impact of the original GfB garden. GfB school gardens are now to be found across Denmark on farms, in parks, in agricultural schools, playgrounds, nature centers, private gardens and on school premises. This trend is also visible across North America and Europe. Unlike the majority of school gardens in North America, which are located on school premises, most school gardens in Denmark are located on farms, nature centers, or other settings outside the school premises. This could have to do with the fact that most school gardens were started by stakeholders such as farmers and others with a passion to teach children. A result is increased access to more natural environments with trees, wild plants, and animals. Several new school gardens are, however, on school premises, as this reduces costs and transportation. Common to most GfB programs is that they combine learning about nature and growing food with outdoor cooking and developing tastes and social and personal skills. A typical day starts with groups of students from first to sixth grades weeding in the garden, then going on a tour round the garden with a nature guide to explore wild plants and insects, followed by cooking over an outdoor stove and tasting their own meal at the end.

Most research undertaken on school gardens has taken the form of either short-term intervention studies or evaluation studies focusing on the impact on health and nutrition. These studies show an increased willingness among children to try new foods and increased preference for fruits and vegetables (Evans et
Some studies indicate that gardening connects children with nature and enhances their understanding of and motivation for studying natural science because they enjoy doing practical activities while learning science and mathematics (McCarty, 2010; Passy, 2014). Other studies find that garden-based learning promotes children’s interaction with the environment as well as their understanding of historical, cultural, and ecological factors (Green, 2013; Johnson, 2012; Dyg, 2014). Several studies show that horticultural activities enhance social skills and contribute to a sense of community. The joint project of planting, caring for and harvesting crops strengthens a sense of community among participants and helps them see themselves and others in new ways (Baker, 2004; Bell & Dyment, 2008; Bowker & Tearle, 2007; Dillon et al., 2005; Grugel, 2009; Hoffman et al., 2007; Lautenschlager & Smith, 2006; Pudrup, 2008; Rahm, 2002; Shinew et al., 2004; Walter, 2012; White, 2011). A study by Mayer-Smith (2009) showed that these activities lead children to develop a different view of themselves in relation to the natural environment, to mirror older volunteers, and to identify themselves as gardeners and farmers (Mayer-Smith, 2009).

Few studies have investigated the effects of the garden environment on student wellbeing. Wellbeing, however, came up as a key theme during the exploratory research. For this reason, the present article will explore the wellbeing associated with students’ participation in outdoor activities in the GfB program. The article will address the research question: What role is played by the outdoor environment in the Gardens for Bellies school garden program in relation to students’ wellbeing?

**Research methodology and design**

GfB school gardens are located in rural and urban areas across Denmark, typically with students participating from kindergarten and up to ninth grade. Activities vary, and depending on the setting and the available facilities, they can include guided walks with a nature guide exploring nature around the garden, gardening, tasting, and cooking meals on the outdoor stove, playing in the garden, and tending to bees and animals. Depending on the setting, students undertake various types of subject-specific schoolwork; from writing poems, learning about pollination to estimating the yield of a potato plant. Students typically come once a week from April to October. If the school garden is located at the school, the visits are more frequent. The school gardens are a part of the municipalities’ strategies to promote health and wellbeing, academic development, and/or environmental competences.
Case study design and data collection
The study applied an exploratory and inductive research approach, starting with observations and interviews and then identifying themes and relevant theories. A case study design involving multiple cases was chosen in order to take account of the range of settings and garden program types that the GfB program wished to gain insights into. The broad topics explored in the cases included themes of wellbeing, learning and food knowledge, pedagogy in the various garden settings, and organizational set-ups. This article, however, will only present findings related to the role of the outdoor environment in the garden on student wellbeing. According to Yin, the benefit of case study research is that investigating the different factors influencing a phenomenon results in an in-depth understanding of the phenomenon (Yin 2009). For this reason, the research looked at the garden setting as a phenomenon and at how different aspects in the garden influenced student wellbeing. In our examination, we will investigate the phenomenon based on general relationships and conclusions across cases.

Cases were selected based on differences in geographical location (urban and rural) and in physical location (farm, park, school, etc.). Five gardens were selected: three centrally located school gardens (i.e. located in a central location requiring transportation time to and from the garden and open to several schools), one community-based school garden within walking distance of the schools, and one school-based garden located at a school.

Table 1: Overview of cases

The research was conducted by researchers from Aarhus University and Metropolitan University College in Copenhagen and financed through funding from Nordea fund. The scope of the study and the case selection were decided in collaboration with the staff of the national GfB program, with the objective of improving the program and studying different garden settings. Case study research was identified as the most appropriate methodology to document different garden types and the role of outdoor environments across cases. No bias was found in the interviews with GfB staff, garden educators, teachers or students, or in the case selection.
Research methods

The research involved field observations in all five gardens. These were recorded using a dictaphone, observing garden activities, interactions and collaborations between students, and between students, garden educators, and teachers. Informal interviews were conducted with teachers and students during the garden observations to verify observations. Field observations were documented in a protocol and were discussed with teachers and students during the interviews. Qualitative in-depth interviews included focus group interviews with students from kindergarten to eighth grade in five schools (n = 30 students), interviews with garden educators (i.e. staff teaching in the school gardens, including chefs, nature guides, biologists, horticulturalists, health workers, n = 8), and interviews with teachers from the schools (n = 16). Researchers from Metropolitan University College and Aarhus University conducted all interviews and observations.

Students who had been in the gardens during observation visits were selected for interviews two months after the garden program had ended. The selection criteria for interviewees were that the students should be from different grade levels, with an equal number of boys and girls but differing levels of school garden experience and personal backgrounds. Based on these criteria, teachers selected students for the focus group interviews. The focus group interviews were conducted at five different schools. Each focus group consisted of four to six students: half were male, the other half female. Interviews with teachers took place either before or after the focus groups with students. Interviews with garden educators were conducted right after a garden observation.

Interviews and observations investigated the following themes through open-ended questions:

- Wellbeing (emotions, competences, successes, and interpersonal relations)
- The outdoor environment and related activities and interactions
- General attitudes and learning about GfB

An online questionnaire was sent to the parents of students taking part in the gardens in 2014-2015. It combined closed and open-ended questions about their child’s learning, food preferences, and wellbeing during the program, as well as the parents’ general attitude to the program. The questionnaire was distributed via teachers to 136 parents at five schools in November 2015. Of these, 96 completed the entire questionnaire, and 14 answered it in part. This constituted a response rate of over 80 percent, which is satisfactory. Parents’ responses were an important source of insight into general student wellbeing, as they
received reports about their child’s experiences in the gardens when they came home, enabling them to evaluate the impact of the school gardens on their child.

**Data analysis**

The research team transcribed and coded interviews and observations in QSR Nvivo 10. An external researcher read and checked the coded interviews in order to minimize bias. All interviews and quotes were anonymized. Observation data and the interview data from students, teachers and garden educators were triangulated in an empirical research report comparing quotes from different stakeholders (Dyg et al. 2016). Subsequently, qualitative data was triangulated with data from the online questionnaire for parents using SurveyXact. An inductive research approach was used and the theoretical framework was developed at the end of the research process. Inductive research looks for patterns from observations and interviews, and for this reason theory is applied in the last part of the research process, once patterns have been identified (Goddard and Melville, 2004; Bernard, 2011). Thus, the conceptual framework was developed after the data collection. Themes from the coding process were then connected to the conceptual framework in the analysis.

**Conceptual framework**

Research on children’s wellbeing is a wide field, but the influence of the external environment and nature has been relatively neglected compared to research fields such as health promotion, where the link between nature and wellbeing has been acknowledged for decades. Maller et al. (2005) conducted a systematic review of studies on the benefits of nature (parks and nature reserves) on wellbeing and health, and numerous studies document benefits ranging from beneficial physiological effects, to reduction of mental fatigue and stress and a more positive outlook on life (Maller et al, 2005). The conceptual understandings of wellbeing, and in effect the methods used to study it, are quite diverse, ranging from sociological and population-level approaches looking at structural and objective outcomes and approaches to psychological approaches based on subjective reports of feelings and experiences (McLellan and Steward, 2015; Amerijckx and Humblet, 2014).

Lucas, Diener, & Suh (1996) define wellbeing as comprising two main components: affect (i.e. feelings, emotions, and moods, e.g. feeling happy) and life satisfaction (which is defined relative to specific domains in life, e.g. school, family). According to McLellan and Steward (2015), findings from studies of
adult wellbeing cannot be directly and uncritically transferred over to children and young people. McLellan and Steward developed and tested a comprehensive model of wellbeing as an instrument to measure wellbeing among school-aged children. The tool measures wellbeing in four areas: interpersonal wellbeing, life satisfaction, perceived competence, and negative emotion (McLellan and Steward, 2015). UNICEF emphasizes objective wellbeing, focusing on sociological (family and peer relationships) and material wellbeing (including educational, health and safety), although subjective wellbeing is also included (UNICEF, 2007). A systematic review by Amerijckx and Humblet highlights that negative, eudemonic, objective, material, and individual approaches to child wellbeing predominate over positive, hedonic, subjective, spiritual, and collective dimensions. The authors call for further work to be done on the latter (Amerijckx and Humblet, 2014).

Our study on GfB had a more specific emphasis: to investigate the role of nature, specifically of gardens, as a setting for developing competences, interpersonal interactions with peers, garden educators, and teachers, and various emotions arising from interactions with the natural environment and food. Thus, there are relevant linkages to McLennan and Steward’s definition given above.

Several researchers and educational theorists have argued for the importance of contact with nature and natural settings as a source of learning and wellbeing. Sandell and Öhman (2010) argue that the legitimization of outdoor education and outdoor life can be traced back to two incentives: being a good method for achieving a variety of purposes, including bodily and mental health, group solidarity and environmental awareness, but also the intrinsic value of outdoor life and contact with nature. Students’ strong feelings of care and responsibility for animals and plants can be seen as an example of a moral reaction, a spontaneous feeling of care that results in students paying particular attention to such needs and shapes their moral relations to nature. To some extent, we can understand Sandell and Öhman’s points here as expanding our understanding of the interpersonal and emotional dimensions of wellbeing so as to go beyond human interactions and relations and encompass our relations with nature and all its living beings. They highlight that outdoor life and learning offer an alternative value-experience of the quality of life: “a rich life of simple means,” linked to physical and mental freedom, spontaneity, community, and an experience of nature (Sandell and Öhman; 2010).
Feral’s 1998 study on the impact of nature on the wellbeing of children emotionally at risk defined wellbeing as comprising positive emotions (happiness and satisfaction), self-esteem (resulting from a positive self-concept), and behavior (including empathy resulting from a positive self-concept and cooperation and civility involving commitments, loyalties, and morality related to oneself and others). Feral developed an intervention on eco-psychology and documented its effects sing drawings and self-esteem questionnaires pre-and post-intervention. Results showed that educational development was enhanced because children felt smarter and were more willing to be active students due to an enhanced self-concept and successes. Aggressive behavior decreased, and students learned to be part of a group and recognize emotions in one another by observing the behavior of animals. They experienced a closer kinship with the animal kingdom. The happiness cluster showed the highest increases post-intervention, with a mean T-score of 38.6 before intervention and 51.6 post-intervention. Feral proposes a new child development theoretical model: connecting the self of a child to others and to nature, ensuring that the child understands and feels his/her intricate place in life’s synergistic structures, exposing the child to experiences of nature, familial connections and global interactive connections, and exposing the child’s senses to nature’s sensations. (Feral, 1998)

A more recent case study by Waite et al. (2016) focuses on young people’s experiences of tree-planting as a source of ecological wellbeing in the “Good from Woods” project in south-west England. The study documents the interdependencies between personal and planetary wellbeing as part of their respondents’ reflections, and suggests that experiences of environmental action and its positioning act as a form of altruism for the greater good, which can provide a source of positive feelings among young people. The study found that most young people with tree-planting memories appeared to position themselves positively in relation to the wider world and to feel connected with more-than-the human world. They derived personal wellbeing from acting altruistically on behalf of humans and nature by planting a tree, in addition to enjoying the social interactions experienced at the time, demonstrating an ecological sense of wellbeing that acknowledges interdependence with others, including nature. Both those who had and those who had not planted a tree anticipated positive benefits to tree planters from that activity, but 48 percent of planters found it to be a very “important” activity, compared with only 27 percent of non-planters. For those who had planted a tree, the meaning of the act could be recalled, providing a continuing resource for feeling a valuable contributor to the human and natural world. (Waite et al, 2016)
Inspired by Feral (1998), McLellan and Steward (2015), and Sandell and Öhman (2010), the present case study will use the following components of wellbeing to analyze the themes emerging from the qualitative findings related to how nature in and around the school garden domain contributes to student wellbeing:

1. **Positive emotions:** How nature and nature-related activities contribute to student emotions including feelings of happiness and satisfaction, the exposure of the students’ senses to sensations in nature, emotions involving human interactions and relations, and the students’ relations to nature and its living beings.

2. **Interpersonal wellbeing:** How the school garden setting facilitates connecting the child’s self to others and to nature. How the students experience nature, human, and global connections, and how he/she understands his/her place in the world.

3. **Self-esteem:** How the GfB program—including the activities undertaken, the sharing of tasks with peers, and the input of the garden educators—contributes to students’ positive self-concept and perceived competences.

4. **Behavior:** How student behavior—including expressions of empathy, cooperation, and civility involving commitments and morality—is expressed during and after the GfB experience.

Thus the definition of wellbeing applied to this research includes both psychological (emotional) and social aspects.

**Findings**

Combining themes from the empirical data collection with the conceptual framework, findings will be analyzed here to shed light on the role played by the outdoor environment and related factors in the GfB program in relation to students’ wellbeing.

**Positive emotions**

Positive emotions in the context of nature-based education are related to how nature and nature-related activities contribute to the students’ emotions such as their feelings of happiness and satisfaction, including exposing their senses to nature, to human interactions, and to interactions with other living beings (Sandell and Öhman, 2010). In all five focus group interviews, the majority of students expressed positive emotions about their garden experience. Many said: ‘It’s been the best school year of my entire life’ and explained how it affected their mood:
Girl 1: It’s more or less impossible to get mad out there.
Boy 1: No, you can’t.
Boy 2: You only feel happy when you’re out there.
Girl 2: You’re just outside, you’re just outside ALL day. You’re just free.
(Focus group interview, fourth-graders.)

The students gain a sense of freedom and happiness from being outside. Here it is not a question of social interaction, but simply being outside and feeling free. The same is true for these kindergarten to first-graders in another primary school:

Interviewer: How has your mood been out there?
Girl 1: Really, really great.
Girl 2: I think it was really fun.
Girl 3: I also think it’s been really fun.
Girl 1: I’ve been happy no matter what.
Boy 1: I’ve been a little cranky and really happy.
Interviewer: What made you cranky?
Boy 1: It was when we had to travel up there [to the garden].
Interviewer: Why?
Boy 1: I can’t remember.
(Focus group interview, Kindergarten to first-graders.)

Even the boy looks back on his experiences with joy and has forgotten why he was initially unhappy about going. These students recall, later in the interview, that these feelings were related to being outside and feeling free. This quote from a girl illustrates how the open garden environment affects her feeling of happiness:

It is a large area. You can see more. You can always find your friends. You just know the place.

(Focus group interview, fourth-graders.)
This is especially a key finding in school gardens that were located in central locations away from the schools and characterized by large open spaces full of places to play.

Although the majority of students expressed positive emotions both in the gardens and afterwards, there were also students for whom a day without a fixed structure outdoors was problematic. They found a day in the garden difficult and hectic. This was primarily the case for smart students and those with a diagnosis. The remainder of the data shows that students expressed positive emotions both in the gardens and afterwards.

Several teachers saw participation in the program as an opportunity to promote student wellbeing in a social environment that encourages cooperation among students, thus strengthening their relations with one another. These teachers’ understanding of wellbeing was tied to the interpersonal as well as the individual level (building student self-esteem). For several teachers, GfB offered an opportunity to work with the students’ academic learning and wellbeing at the same time. This view of the program centered on working with student interpersonal relations, which we will come back to.

Unlike the teachers, who did not explicitly mention that the outdoor environment itself was contributing to the students’ wellbeing, this garden educator highlights that the school garden contributes something special:

> They are in a special state of mind, where they open up. It’s from being in nature. I think that’s by far the most important thing in this!
> (Interview with garden educator.)

The garden educator here, like the students in the previous quote, appears to connect wellbeing directly to being in nature, whereas the teachers are connecting it more to human interactions and relations among students that can be nurtured in the gardens through garden activities such as planting, weeding, and harvesting.
**Interpersonal wellbeing**

This component of wellbeing refers to the connections between the students and others and the students and their relations with nature. It has to do with experiencing familial and global connections, and the ways in which students understand and feel their place in the world.

In the focus group interviews, students noted that there are fewer conflicts and less teasing in the garden:

> Girl: I think there was less conflict out in the school garden than there is at school.
> Boy 1: I think so too.
> (Focus group interview, fourth-graders.)

Several students mentioned that when they were outside they were able to walk away from conflicts, thus avoid ing escalating negative emotions into conflicts:

> Girl: I don’t understand how they could get mad at each other, because I am never angry out there. I am just happy when I am out there.
> Boy: There are some minor conflicts out there.
> Interviewer: Is it a different way to resolve conflicts? It is easier when you get angry?
> Boy: Yes, you can just walk away.
> (Focus group interview, fourth-graders.)

This quote from a girl explains how she sees relations and connections between students in the school garden:

> It’s as if everything is opened up when you get out there.
> (Focus group interview, fifth graders.)

This does not mean that there are no problems in the outdoor setting—particularly when there are large groups of students, including some with a diagnosis such as ADHD or autism. Both teachers and field observations record that the free outdoor environment with many students outside at the same time can feel chaotic and overwhelming for these students, meaning that conflicts may arise. These incidences
aside, several students note that there is space and time to handle conflicts in the school garden, for instance, that they can easily walk away from a conflict. Teachers’ perceptions of conflicts are more ambiguous. Some expressed the same opinion as the students; others mentioned that they had not registered any difference between the two settings.

A boy in the following focus group interview felt that the time spent with his peers was different in the garden compared to the classroom:

Boy: It’s also because I feel I get teased a lot here at school. But there’s hardly ever anything out there. It’s as if... well... they never teased me out there. Nothing ever happens, and they let me in and let me join in. It doesn’t happen very often here at school. [...] So I’m very happy about the school garden.

(Focus group interview, fifth graders.)

Several teachers had the same experience. In the garden, established roles at school change and are opened up. The boy talks openly in front of his classmates about being bullied in school. He feels there was no teasing in the garden because other students involved him in the garden activities. There are other examples of students discovering that they excel at something: weeding, knowing about plants, insects, daring to taste something new, or going near a beehive. The teacher elaborates further:

Out there they share something. “We need to get the job done as a joint effort,” and they can see the purpose of it, because otherwise they might not get finished. It’s hard to do it all by yourself. That makes them work together better. And he really does work hard!

(Interview with teacher, fifth grade.)

Learning outside appears to change the dynamics between students; established roles in the school setting shift, and connections become closer. Teachers recognize new sides to the students, changing their perception of them, as in this interview with a garden educator:
[The] teacher said: “Well, I don’t understand either, because at school nobody wants to be a substitute teacher for them, because they can’t sit still. They make noise, and it’s terrible. But as soon as they get outside they do just as they are told. Everything goes smoothly.” She said that she tried to learn from this, because she couldn’t understand why it was so different. I thought that was funny because they were angels up here. All of them.

(Interview with garden educator.)

The teacher discovers that her students behave completely differently when they are outside with garden educators who have a different approach. Studies of outdoor education such as Fägerstam (2013) have also pointed to changing views and relations between teachers and students after teaching outside the classroom (Fägerstam, 2013).

The cooperation among the students is not without problems: some feel frustrated when others go off to play instead of doing gardening. Others learn to handle these situations. One example is this girl:

    Well if there is someone who doesn’t want to [work in the garden], then I just do it myself. I don’t want to get involved in these problems.

(Focus group interview, Kindergarten to first-graders.)

Learning how to handle such challenges is an important part of interpersonal relations and self-esteem.

**Self-esteem**

There are several examples of the activities themselves, the shared undertaking of tasks with peers and the input of the garden educators contributing to the students’ positive self-concept and perceived competences.

Garden educators across cases combine subject-specific learning objectives with promoting student wellbeing, including self-esteem, interpersonal relations, and sense of community. These objectives involve discovering, sensing, overcoming fear, creating a sense of community, having to cooperate, learning social rules, feeling ownership of their garden and vegetables, and enabling individual students to have successful experiences in a social context. All these objectives are linked to emotions, self-esteem, and interpersonal relations. A garden educator highlights this:
They should gain a successful experience. That’s what it’s actually about. Especially because [gardening and nature] is so new to them.

(Interview with a garden educator.)

The garden educators highlight that they apply appreciative pedagogy as their overall teaching philosophy. Some of them have a teaching background; others, like this garden educator, are self-taught, but have a passion to teach children about food and nature.

The example of the boy, who had been teased in school but was included in the community of peers in the garden and got a chance to excel there, suggests that his self-esteem improved as a result of these garden experiences. However, the study cannot document long-term effects on students’ self-esteem, i.e. whether or not these new roles and relations are transferred back to the school setting.

Parents were asked about the impact of GfB on their child’s wellbeing and whether it had given them successful experiences. More than half the parents who responded to the questionnaire confirmed that the program had had a positive effect on their child’s wellbeing (Figure 1).

**Figure 1: Have you noticed if your child’s participation in the school garden program has had a positive effect on his/her wellbeing?**

88 percent of the parents answered that their child’s participation had given him/her successful experiences:

**Figure 2: Has your child’s participation in the school garden program given him/her some successful experiences?**

In the questionnaire, parents elaborated on these successes and benefits:
He enjoys using his muscles, digging and working hard. He tells us what he learned when he gets home with great enthusiasm. He’s also taught me how to do it in our own garden.

The cooperation with the various adults has been a great success. My daughter was given responsibilities and tasks, which she enjoyed a great deal.

Every time has been a success. Either in the form of vegetables growing, or when she was able to do something completely on her own by the fire. Or just showing off a radish when she got home—it’s not just a radish, it’s her own homegrown radish.

Responsibility, pride, and physical evidence that hard work pays off.

(Written quotes from parents’ survey.)

These successful experiences were about students being responsible for different aspects of the cultivation process, thus gaining competences and a positive self-concept about what he/she was able to do. The various garden activities and responsibilities given to them—seeing that they had produced a vegetable from a seed, harvested it, and brought it home to eat—gave them confidence. The same was the case when tasting food they had made over a fire using their own vegetables.

Parents experienced signs of responsibility in their child and witness their child being able to teach them something. This can be interpreted as enhancing the children’s self-esteem, positive self-image, and recognition by their peers, garden educators, teachers, and parents. The teachers also notice how the students’ self-esteem improved:

I think that one of the biggest successes out there is to see some of the students who find it difficult to be an integral part of the daily lessons, especially boys, live up and shine in a different universe, because they are allowed to stand up and walk around. I think that is a significant experience. To see them flourish, it’s beautiful.

(Interview with eighth- and ninth-grade teacher.)
Behavior

Behavior includes expressions of empathy, cooperation, and civility. It is somewhat linked to the interpersonal level, but goes beyond it to include commitments, loyalties, and morality expressed in interviews after the school garden experience.

Through the nature guides and the other garden educators, the students learn that their actions—what they do and how they treat animals and insects—matter. They learn to see that they themselves are a part of nature. This was clear in the observations, where students were taught about bees and their important role in the ecosystem, and how to treat bees and other insects. A teacher explains further:

> It gives the children a unique opportunity to understand how they as individuals are part of nature, and how they in synergy with nature can get a reward from their garden. In Gardens for Bellies, we observe how the kids treat earthworms, salamanders, beetles and frogs carefully, how they care about their plants’ growth. Nearly all children gain a large sense of ownership of the garden, which they have nurtured for a whole season.

(Interview with fourth-grade teacher.)

Garden activities in the outdoor setting encourage and challenge students to step out of their comfort zone: to taste new plants and insects, to explore a beehive, to touch animal manure, start a fire, or work hard in the soil. The students relate to and gain a special bond with nature. An example is that students treat their vegetables as their “squash babies” and develop emotional bonds with insects, like this boy:

> I was just building a small house for my friend, my beetle.

(Focus group interview, Kindergarten to first-graders.)

In the observations, the students were interested and fascinated by insects. They showed respect and were loving toward them. This is also expressed in the fact that students were caring, respectful, and proud of the food they had grown. They showed it off proudly, took it home to their parents or immediately cooked it.
The role of the garden educators is highlighted in several interviews. They consciously focus on the students’ successful experiences, decision-making and accomplishments:

   Interviewer: What were they like [the garden educators]?
   Girl 1: *Really* great.
   Boy 1: Yes, super great.
   Girl 2: So nice.
   Interviewer: Were they different from your teachers?
   ALL: Yes.
   Girl 2: They were more “You just do it,” “It’s up to you.”
   Boy 1: “It’s up to you.”
   Interviewer: How do you feel about being able to decide for yourselves?
   Boy 1: Excellent.
   Boy 2: It’s cool.
   Girl 2: You just knew you could decide yourself.
   Boy 1: It was really cool that we could decide.
   (Focus group interview, fourth-graders.)

This relates to wellbeing in the sense that students were given responsibility to achieve something by their own actions.

The commitment, loyalties, and care for planetary wellbeing and students’ related values and actions discussed by Waite et al. (2016) and by Sandell and Öhman (2010) were expressed by some of the teachers as an objective:

   An organic school garden introduces children to a local sustainable food system that can provide pupils with skills that perhaps inspire them in their future lives to grow some of the vegetables they eat. By cultivating their own produce and cooking from scratch, we know where the food comes from and what it contains. It also gives children a unique opportunity to understand how they as individuals are part of nature, and how they in sympathy with nature can get produce from their own garden.
   (Interview with fifth-grade teacher.)
These sentiments were not expressed directly by the students. This could be due to their lack of ability at the time to reflect and connect the garden experience to a broader understanding, concern, and commitment for the environment; but it could equally be because most garden educators did not tie in their teaching to broader environmental challenges and actions. Most of the teaching was about agricultural and ecological literacy at a micro-level: how to grow food and understand ecological cycles. Broader perspectives related to environmental actions and global issues were rarely articulated. In one case, the students were told about the importance of pollinators and how to protect bees, for instance by keeping more flowers in gardens—once again, at the micro-level.

Discussion
The link between children’s wellbeing and contact with nature is under-represented in research. This study contributes further insights into these linkages. The findings suggest that being outside in the GfB gardens in an open, free environment as another setting for learning contributes to students’ emotional wellbeing and their interactions with one another. They handle conflict better and they feel happy and free. Wellbeing in the sense of interpersonal relations and self-esteem also seems to be enhanced by the activities in the garden and facilitated by the garden educators. In other words, not only does the outdoor environment positively affect student wellbeing in the sense of emotions and interpersonal relations, but so do the hands-on activities in the garden that the outdoor setting facilitates, supported by the knowledge and engagement of the garden educators related to these activities. Garden educators and some teachers explicitly endeavor to promote student wellbeing, helping them to realize their own potential. Examples are when the students successfully grow their own food in collaboration with their peers, cook homegrown vegetables, and dare to go near the bees. The garden educators encourage the students to try new, challenging experiences - putting in hard work, seeing their seeds grow into vegetables, and bringing vegetables and recipes home to their parents - which enable them to contribute to their group, their garden, and their homes. In this way, the school garden activities, the sharing of tasks with peers, and the input of the garden educators all contribute to the students’ positive self-concept and perceived competences.

Many students expressed a deep sense of happiness from learning in a natural environment, spending time with peers and learning from inspiring garden educators. Student wellbeing in the gardens appears to be associated with being outdoors and experiencing social interaction with peers, garden educators, and
teachers offering them opportunities to participate actively in the garden activities. The findings reveal that the social environment in the gardens and the roles taken by the students encourage cooperation, but also that the natural environment has a special impact on the students’ sense of wellbeing and enables them to walk away from conflicts, should they arise. Sandell and Öhman suggest that our understanding of the interpersonal and emotional dimensions of wellbeing should be extended beyond human relations to encompass our relations to nature and other living beings (Sandell and Öhman, 2010). These relations pointed to strong feelings of care and responsibility for animals, insects, and plants by the students. According to Sandell and Öhman, these feelings can be seen as an example of a moral reaction: a spontaneous feeling of care which, according to Sandell and Öhman, results in students paying particular attention to such needs and shape their moral relations to nature (Sandell and Öhman; 2010).

Waite et al. (2016) discuss how these feelings and experiences - “feeling confident/capable/purposeful” or “socially supported/supportive of others” - contribute to student wellbeing in both psychological and social dimensions. As mentioned, Waite et al. found that many young people with tree-planting memories positioned themselves in a positive relation to the wider world and to nature (Waite et al, 2016). These broader global connections were not studied in the present study, nor do the activities in the garden suggest that broader global perspectives are highlighted in the GfB program as environmental actions. GfB and similar school garden programs should build on the micro-level understanding of food and nature to articulate broader environmental actions and solutions either within the existing program or as follow-up to the garden experiences in the classroom or later in school.

The garden educators and teachers in the study focus on both individual and collective dimensions of wellbeing, from a positive perspective of wellbeing. This fits well with the call for positive, hedonic, subjective and collective dimensions of wellbeing advocated by Amerijckx and Humblet (2014).

GfB aims to connect garden-based learning to the classroom setting in order to promote learning, wellbeing, and a connectedness with nature. However, sustaining wellbeing including interpersonal relations among students when they return to school could imply challenges. Transferring new relationships and connections with nature back into the classroom and other areas of students’ lives and future are underlying objectives both of teachers and of the program. The example with the boy who had been bullied in school but not in garden could suggest that roles and routine ways of interacting are somehow connected to the environment and the social culture in that environment. We might therefore
question if the interpersonal relationships in the school garden are sustained in the school setting. Similarly, neither this nor other studies look into the long-term impact of connecting students with nature and how that may contribute to future behavior, for instance by shaping children’s future moral relationships with nature. Further research on the link between wellbeing in outdoor settings and in the classroom is called for, as well as studies to document the long-term effects on commitments and morality to nature expressed after school garden experiences.

Even though this study’s findings document a positive attitude among students, teachers, and parents to the program’s impact on wellbeing, reservations were also expressed. Students who need structure or a more cognitive approach to learning find garden-based learning boring, or too chaotic. The research did not look into whether the positive interpersonal relations, the impact on self-esteem or other aspects of wellbeing experienced by students during their garden experiences impacted positively on their roles in school. These factors and the long-term impact of school gardens back in the classroom need to be addressed in future research, as there is limited knowledge of the longer-term effects of school garden or other outdoor programs.

**Conclusion**

Our findings from the exploratory research suggest that outdoor environments at GfB promote student wellbeing. A few students were negative about the school gardens, but the majority expressed positive emotions about being outside in an outdoors environment. The various activities and relations to peers, garden educators, and teachers seemed to positively affect competences and self-esteem. The feeling of success resulting from recognition by garden educators, teachers, peers, and parents seemed to build self-esteem. Being in the garden and interacting with classmates in new ways seemed to promote students’ wellbeing, including their self-perception and their interpersonal relations. In the outdoor setting, interpersonal relations were established, allowing for the recognition of new sides to the individual students by their peers and teachers.

Students’ relations to the natural environment also seem to have been affected as they learned to treat animals, insects, and plants with empathy and care. They learn to connect with and to see themselves as a part of nature. Both teachers and garden educators aim to promote students’ long-term commitment and care for nature. Other studies have documented the interdependencies between personal and planetary
wellbeing as part of their respondents’ reflections (Waite et al, 2016). However, this study did not document such effects.

School gardens can be a setting for promoting not merely academic learning but also wellbeing, including interpersonal relations and empathy for nature. The extent to which positive interpersonal relations are reinforced back in the classroom setting is, however, unclear. Similarly, the link between personal wellbeing and care for planetary wellbeing calls for further investigation.
References


**Figure Captions**

Table 1: Overview of Cases. p. 4

Figure 1: Have You Noticed If Your Child’s Participation in the School Garden Program Has Had a Positive Effect on Your Child’s Wellbeing? p. 11

Figure 2: Has Your Child’s Participation in the School Garden Given Him/Her Some Successful Experiences? p. 11