PLANTING SEEDS, HARVESTING MORE THAN PLANTS: A QUALITATIVE STUDY OF YOUNG STUDENTS' ENVIRONMENTAL LEARNING ON UBC FARM

by

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Abstract

Here was a story that happened in one of the multi-visit field trips in the UBC Farm. My master gardener partner Nancy and I told the students that if they want to preserve seeds long-term, they should keep the seeds dry in a cool, dark place. However, two weeks later, one of our students brought a bag of what he thought were "failure seeds" to us. He was excited because all of his seeds had sprouted. This phenomenon was far from what we expected. However, we found that the student who made this "mistake" was keen to know what had happened. At this time, all the students in my group became interested in knowledge about seeds. We assisted them by reviewing what they learned the last visit. For example, we had told them a certain part of the seed would become the first leaf in a sprouting seed. This time they could see exactly which part of the seed had become the first leaf. The amazing thing was that the "failure seeds" helped them make sense of the pure facts about seeds.

This could not have happened had this not been a multi-visit field trip, because the students would not return with the sprouted seeds. This event is a perfect example of the value of multi-visit farm- or garden-based educational methods. The research I conducted at the UBC farm, where this event took place, provided many examples of how this learning environment engaged students' cognitive learning, effectively changed their behaviour patterns, and led to changes in their attitude toward nature and environment.

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Introduction

Intergenerational Landed Learning Project

There has been an Intergenerational Landed Learning Project located in the Children's Gardens at the UBC Farm since 2002. This project is an intergenerational, farm- and garden-based environmental education instrument. As stated on the website, the Landed Learning project focuses on agriculture and food as the link between a healthy environment and human wellbeing. By uniting generations in a community learning initiative, this program illustrates the values of lifelong learning, community mindedness, ecological and social citizenship, and civic responsibility (Landed Learning, 2010). These are values that are difficult to communicate in schools and classrooms and are best learned through personal and community experience (Mayer-Smith, Bartosh & Peterat, 2009).

The curriculum for the Landed Learning project is based on 10 full-day farm field trips and one school visit, conducted from September to June. Although sometimes learning at the farm happens in a more formal setting in a classroom-like greenhouse, most learning emerges through interactions with the land and collaboration with peers and volunteers in small groups. Children and volunteers work together over a school year to plant, harvest and observe their own garden bed.

Volunteers at the Landed Learning Project include students and local community members. While not all volunteers have gardening knowledge, a more experienced volunteer usually is paired with a less experienced volunteer in a team. These teamed volunteers, known as Farm Friends, will work with groups of three or four students during a school year.

Every group has one small garden bed. Their will plan, plant, weed, and harvest in their own garden bed during the whole school year. I provided examples of the small garden beds in **Figure 1**. Usually, the students will come to the Farm every other week except in winter. I provided a time schedule of the students from Graham Bruce Elementary in **Table 1** as an example.

Personal journey to the research question

I joined this Landed Learning Project in September 2012 and became a farm friend, facilitating a group of three students from Graham Bruce Elementary. My role was as a researcher as well as a volunteer. I did my own research in this project. In this study, I explored the impact of farm- or garden-based multi-visit field trip experiences on students' informal learning. I would like to explain the reason why I choose this research question.

Figure 1: The small garden beds

Table 1: Graham Bruce Elementary field trip time schedule 2012-2013

Visit 1	Wed., September 26, 2012
Visit 2	Wed., October 10, 2012
Visit 3	Wed., October 24, 2012
Visit 4—School Visit*	Wed., February 13, 2013
Visit 5	Wed., March 13, 2013
Visit 6	Wed., April 10, 2013
Visit 7	Wed., April 24, 2013
Visit 8	Wed., May 8, 2013
Visit 9	Wed., May 22, 2013
Visit 10	Wed., June 5, 2013
Visit 11	Wed., June 19, 2013

***NOTE**: Visit 4 was held at the school.*

Before I became a volunteer in Landed Learning Project, I had not worked on a farm and did not have any gardening experience; therefore, taking part in such a project at UBC farm would give me first-hand experience in such a friendly setting. Before I joined in this project, I also could not imagine that I would love this project so much that I plan to introduce this project to my hometown in China.

I am an international student came from China. As far as I know, in China, there are no such educational projects for elementary school students in a Farm setting. The reason I chose to become a volunteer in this project was that I found it was new to me. I wanted to know how such a program, held on a farm, would help young students to learn about nature outside the classroom. Therefore, at the very beginning when I joined the Landed Learning project, I defined my role as a learner as well as an educator. During the time when I was a volunteer, I found that I, as an adult, not only learned lots of knowledge about gardening, but also fell in love with the environment at the farm. I experienced the excitement during the

process of planting seeds by myself, waiting for them to germinate and finally seeing the seedlings grow. From that time, I started to think, if the Landed Learning Project could have such positive influence on an adult, it could possibly influence a young student in a similar way. Therefore, I got a new role as a researcher on the farm.

I reflected myself about the question:

What does the Landed Learning Project mean to me as a learner?

First, working on the farm was a brand new experience for me. I felt happy to engage in such a new experience. Second, I felt that I was connected with nature when I was working on the farm. The whole process of planting seeds, witnessing their germination, harvesting, eating, and composting the left over amterial was so amazing. Last but not least, I learned a lot of knowledge and gardening skills. It was different from learning from books. However, the learning on the farm allowed me to see and touch real things, which made me happy and motivated. I hoped to learn more.

As a result of these reflections, I designed this research to focus on the impact of the field trip experiences on young students. I would like to know whether the young students would have the same feelings and learning experiences as I did.

Literature Review

Multi-Visit Field Trips and Informal Learning

It is not unusual that more and more elementary schools have field trips to museums and other outdoors spaces. Many researchers have been trying to figure out the educational value of those field trips. Reviews by Wellington (1990), Ramey-Gassert, Walberg, and Walberg (1994), Falk and Dierking (1997) stated that some school field trips to informal settings resulted in learning, but others did not. The term "Learning" could mean different things to different researchers. There is no single universal or perfect definition of learning in education (Anderson & Ellenbogen, 2012).

Field trip learning is different from the learning in school settings. There is a tendency to think that "learning" means learning facts and concepts. However, learning in informal settings such as field-trip learning leads to different results. According to the Contextual Model of Learning theory, which was developed by Falk and Dierking (2000), learning is influenced by three overlapping contexts: the personal, the sociocultural, and the physical. Generally, students' learning outcomes could be similar to each other's, but the specifics of what they learn could be highly personal. Besides, informal learning is not only restricted to the cognitive perspective, but also includes social and cultural perspectives (Rennie, 2000). DeWitt and Storksdieck (2008) also mentioned that field-trip experience would result in not only cognitive learning outcomes but also social and affective learning outcomes. Students could learn through cooperation with peers or with adult educators. Collective experiences in informal settings are especially important to the individual experiences of the members of

social groups (Briseno, Anderson & Anderson, 2007). More specifically, successful learning can happen in social groups, where all individuals are respected, their learning is supported by other members, and they have opportunities to collaborate with others (Piscitelli & Weier, 2002).

In most cases, the location of a school field trip is always a new place for students and they rarely have had another field-trip visit to the same place (Kisiel, 2003). However, to gain some kind of learning experiences, the students need to have more than one visit. For example they may come to understand the difference of the star chart in different seasons during a planetarium visit or to know plants growth cycle during a farm or garden visit. Such learning needs a comparison between several visits. It is reasonable to assume that there may be a different learning result if the students could have a multi-visit field trips experience.

According to the contextual model of learning, all learning is a cumulative and long-term process (Falk & Dierking, 1997). The end of the field trip does not mean the end of learning. When the students go back home, they probably talk to their parents about what they experienced at the farm or they might link what they have learned to their daily life. Anecdotal evidence from the project researchers (eg. Ostertag, 2009) indicated that children's participation might be transforming their families and communities. Therefore, by interviewing children, this study will provide new insight into farm-based environmental education for children and post field trip interactions of children and parents.

Environmental Education

Education that focuses on the environment is today seen as an essential means of introducing values and practices that help to affect behaviours and environmental concerns. According to the International Union for the Conservation of Nature (IUCN), environmental education is "… a process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings. Environmental education also entails practice in decision-making and self-formulating of a code of behaviour about issues concerning environmental quality" (as cited in Linke, 1980, p. 26-27). Students would learn about the environment, learn from the environment, and learn to protect the environment. Environmental education has been contributing to allowing the public to become aware of and concern about the environmental issues for many decades by developing people's knowledge, skills, attitudes and motivation (UNESCO, 1977).

Generally, there are two perspectives that characterize studies for young students' environmental education. One is focus on how to empower young students to bring social and ecological changes (eg. Uzzell, 1999). The researchers from this perspective are dedicated to educating young students in order to solve ecological and social issues. While the other researchers (eg. Sobel, 1996), are concerned that if young students are confronted with environmental issues in an inappropriate way, they could probably gain a fearful view of nature that can result in paralysis rather than action. Sobel (1996) stated that "what's important is that children have an opportunity to bond with the natural world, to learn to love

it, before being asked to heal its wounds" (p. 10). These two research perspectives are not controversial; both of them were seeking solutions of environmental issues. However, the second perspective emphasizes empathy, bonding and connection with nature, which is also my concern in this study.

Methodology

In this study, I would like to focus on students' informal learning. The purpose of this research is to find out the impact of multi-visit field trip experiences on young students informal learning. In this section, I first provide my rationale for choosing a qualitative research design. Then, I describe the participants of this study, data collection methods, and data analysis.

Qualitative research

I chose qualitative methodology for my research, because it is especially effective in obtaining individually specific information about the values, opinions and behaviours as well as the role of power in shaping our various relationships with people and places. This method allowed me to collect information from the students in the Landed Learning Project.

As Rennie (2000) mentioned, informal learning is not only restricted in cognitive perspective, but also included social and cultural perspectives, which are significant in the field of place-based education. The qualitative approach is suitable for the study of those perspectives, because "…the researcher seeks to establish the meaning of a phenomenon from the view of participants. This means identifying a culture-sharing group and studying how it developed shared patterns of behaviour over time" (Creswell, 2009, p. 22). In addition, Greene and Hill (2005) advocate for the qualitative approach to research with young students, because "children are subject to historical and cultural influences that ensure that every child has an individual and unique experience of his or her childhood" (p. xi). I decided to engage

with the students in the role as a researcher, as well as a farm friend. This is how I developed a relationship with the students.

Data collection

I used three qualitative approaches to collect data: semi-structured interviews, group discussions and participant observations. The data sources covered three different perspectives, the students, the volunteers and mine.

Researcher's voice: participant observation.

Since I was a farm friend in Landed Learning Project, I was a legitimate participant in the situation being observed. Gay, Mills and Airasian (2012) said "a benefit of participant observation is that it allows the researcher to gain insights and develop relationships with participants" (p. 382). I went along with the students for 11 visits during a whole school year. Besides the observation, I had many informal conversations with the students. For example, sometimes they asked me questions they could not solve and sometimes I asked them the reasons for their various behaviours.

I took notes and kept a journal during and after every visit. Most of my observation were about three students in my group[1]. Some of the information I obtained from participant observation was helpful for me to prepare semi-structured interviews, which were more optimal for collecting data on individuals' personal histories, perspectives, and experiences.

[1] I was the farm friend in Group 2. See **table 1** for more information.

Students' voice: semi-structured Interview.

The interview was a qualitative approach that allows the researcher to obtain data directly from the students. It helped me to gather in-depth data about the students' field-trip experiences and their feelings working on the farm (Gay, Mills & Airasian, 2012).

I designed a semi-structured interview contained 14 questions. Additionally, I asked several follow up questions according to the responses of the students during the interviews. My purpose for the interviews was to figure out the following questions:

1. What kinds of experiences will the students remember about the field trips?

2. How will the students feel about the field trips activities, the farm, their farm friends and environmental issues?

3. Do the students find there are any connections between the field trip experiences and their daily lives? What kinds of connections are they?

In addition to the information I planned to acquire, I also encouraged the students to tell me anything they were interested in and would like to share with me.

Since I was a regular volunteer in the Landed Learning Project, all the students I interviewed already knew who I was before the interview. Meanwhile, at the beginning of each interview, I informed the student that I would like to ask them some questions, which had no right or wrong answers. Therefore, the students felt relatively confortable to talk with me and answer my questions. I interviewed 7 students in their school. All the interviews were audio-recorded with the consent of the students.

Volunteers' voice: group discussions.

At the end of every visit, all the volunteers would gather together to have a group reflection about the field trip. Every volunteer would have a chance to share his or her particular experience. All the data from every group reflection was analyzed.

Participants

A class of 24 students in Grade 3 and 4, who joined Landed Learning Project 2012-2013 from Graham Bruce Elementary, participated in my research. They were divided into 7 small groups with 3 or 4 students in each group. Fourteen regular volunteers[2] facilitated their field trip learning during the school year. They also contributed to my study and provided data through group discussions. As an aid to help readers to easily access the group information of the students and their farm friends, I provided a summary of the names of the children, their farm friends and their group code. (See **Table 2)**

Seven of the students (4 boys and 3 girls) participated in the in-depth interview in two days in their school Graham Bruce Elementary. Three of them were interviewed on April 26 and the other four were interviewed on May 9. I intended to interview one child from each group, in order to represent the whole class. Since no one from group 7 consented to join my interview, I chose two students from group 6. In addition, no significant intelligence difference was found between the students I interviewed and the students I did not interview. I could claim that those chosen of the 7 interviewees could safely represent the whole class.

[2] Regular volunteers are volunteers who committed to join in Landed Learning Project and consistently facilitate one group of students during a whole school year. Usually, every two regular volunteers were assigned in one group.

Table 2: Students and their Farm Friends

Group code	Farm Friends (Volunteers)	Students
G1	Karen Shuster & Bahareh Shigamatsu	Adarsh, Winston, Kenneth
G2	Nancy Brown & Miro Li	Aiden, Wilson, Paul
G3	Eunju Yeom & Jane Sherott	Maya, Tahlia, Kelly, Josephine
G4	Raelene Hodgson & Stephanie Rose	Fanny, Roya, Poonam, Tyanna
G5	Daphne Richardson & Yelena Ye	Bernice, Kareena, Tiffany, Keisha
G6	Dian Clare & Irene Chan	John, Zaw Zaw, Kyle
G7	Meghan O'brian & Bahar Khazei	Kate, Chaylee, Riya

***Note**: The students who were interviewed individually: Winston (G1), Aiden (G2), Maya (G3), Fanny (G4), Tiffany (G5), John (G6) and Zaw Zaw (G6).*

Data analysis

Collating the information.

I interviewed 7 students and made memos about the conversations. Then, I made the transcripts of the audio version of the interviews. I read through my journal entries, and chose those observations that reflected aspects of the project mentioned in the interviews. I paid particular attention to notes about those subjects that interested me and expanded on topics and issues about informal education as they apply to this study of the Land Learning Project. For an overall perspective, I noted the threads of the conversations between the volunteers or farm friends who regularly got together to discuss their observations about each day's activities.

Describing.

The context of the study conducted at the UBC farm, an urban farm setting, was a specific project for elementary school students which introduces to nature and agriculture.

These students come regularly throughout the school year to experience growing cycles in nature by participating in gardening activities like planting, weeding and harvesting.

In this context, at the beginning of every visit, all the students gather in a green house. The manager of the project describes to everyone what they will do on this day. Usually the activities of every visit are slightly different according to the seasons. Farm friends help the students to do their work, for example, to show them how to use newspaper to make paper pots for the seeds.

Then farm friends and the students in their groups gather by their garden plot. Farm friends encourage the students to observe the changes in they garden plot. Together they discuss what they need to do on that day: whether they will be planting, weeding, preparing soil, etc. In a typical day, students might remark about their discovery of unfamiliar plants or insects. The farm friends notes the reaction of the students in their group and take the opportunity to talk about the students reactions to kale, worms or spiders.

The changes observed by the farm friends and the researcher include changes in attitude to gardening as an activity involving hands-on contact with soil, insects and plants. As the students gain insight into the connection between growing food, harvesting and preparing food to eat, they became aware of how important nature is to their lives, and were anxious to take home what they had learned.

The interactions between farm friends and the students, and the reactions of the students by the end of the project indicate that the exercise have served its purpose by guiding the

students towards a clearer, more active appreciation for the environment and its place in their lives.

Classifying.

Having reviewed all the transcripts or notes from the interviews, group discussions and participant observations, I categorized the data into three parts: students' cognitive learning, students' behaviour patterns, and students' attitudes. Under cognitive learning I classified the knowledge learned about plants, the skills associated with gardening and concepts like organically grown foods. Under behaviour patterns, I focused on the actions taken by the students, like taking home plants, planting in their own vegetable gardens and helping parents to prepare food. Under student attitudes, I noted the changes in attitudes toward soil and cleanness, differences in reactions toward insects and other creatures and the growing appreciation of nature and the love the students developed for working on the farm.

Findings

The result of the interviews, group discussions and participant observation showed that the field trips on the UBC farm influenced young students' learning in different ways. The most significant impact of field trip experience on students was attitude and emotional change. There were some behaviour patterns found in students, who became more involved with the plants. Students also had cognitive learning, although it was not so significant.

Cognitive learning

Organic food and new plants.

Some students learned some new knowledge about gardening and discovered some new plants they found on the farm. The following dialogues are taken from notes collected from interviews with students.

John, a grade 3 student, told me that we should plant a seed in the soil twice as deep as the length of the seed. John learned this information from the volunteers. And he was enthusiastically planting seeds in the soil. He also learned what lemon balm is.

Aiden and Tiffany reported that being at the farm introduced them to new plants such as kale and turnips. Aiden and Tiffany learned what the new plants are by studying these plants with the volunteers.

All the students interviewed knew what is organic food.

When the children were asked the question "What do you learn about organic food?", all of them explained a relatively correct understanding of the concept of organic food.

The following were some of the answers:

John: They don't spray these things so that (make) insects or bugs don't eat or something.

Tiffany: They don't use pesticides and chemicals.

Aiden: Organic? They don't spray stuff like pesticide; they just do traps (to get rid of pests)... organic food is better for you, 'cause it might be chemicals in other stuff.

Learned how to use tools.

On the farm, the students would use several kinds of tools, like shovels, rakes and trowels. The volunteers pointed out that it is very important to teach the students how to use tools properly, efficiently and safely. Many students have not used the tools before. Several volunteers reported that their students became very proficient using tools.

Maria: They were very happy today. Loved using tools. None of them have before. All the boys learned how to use them.

Daphne: I have never seen such focus when they have been given tools, they each had a trowel and once we show them how to dig, they went at it and didn't stop.

These comments showed that the enthusiasm of the students is common. Furthermore, they gained skills as they worked in the garden.

Impact on behaviour

Take things home and plant their own vegetables.

Many students tended to take things home from the Farm, like seeds, seedlings, or plants. In my group, after almost every visit, the students brought something home, for example, nasturtium seeds, kale, beets, sunflowers and different kinds of seedlings in a paper pot. Some of the students who have their own garden at home reported that they would transplant the seedlings they brought home or plant new vegetables by themselves. Some students just wanted to share with their parents.

Other farm friends also reported their students had the same behaviour.

Bahareh: Winston asked to take home beet seeds.

Parents become involved.

Some students reported that they helped their parents to prepare food more than before. Some students asked their parents to buy organic food, because they learned that organic food is healthier. Some students asked their parents to buy new vegetables, which they first saw and tasted on the farm.

Emotion and attitude learning

Emotional reaction to working on the farm and cooking

According to the interviews, all the students reported that they felt happy to work on the farm. They would like to work on the farm in the future. Most students (5 in 7) reported that "Chef" was their favourite job. They liked to work in the kitchen.

Zaw: Yes, I would like to work on the farm. I get to see Mr. P. We have different group we can do and we could do it all over again and again…

Maya: Yeah, that (working on the farm) would be really fun.

Volunteers also reported that the students usually felt comfortable and happy when they were on the Farm.

Marielle: Very relaxed morning. The kids were really interested. So much more observant and were relating to the little plants. At one point, we were all gardening…some watering, some clipping grass. I said, "Isn't this nice, everyone working together?" One said, "Yeah, I would like to live on a farm." They all agreed.

Maria: They were excited with the seeds. Like the chestnut. They were happy to harvest again and they knew how to do it already. So it was nice for them to do something they'd already done before.

Cleanliness attitude change

There were several students who changed their cleanliness attitude towards soil or compost. I would like to describe one case below.

At the very beginning, Winston refused to touch the soil. Then his farm friends encourage him to use gloves. He gradually became not so quick to refuse to be messy. At the end, he looked at himself and said, “I’m so dirty!” However, he did not look unhappy. On the contrary, he laughed aloud. The conversations below are volunteers talking about Winston.

Karen: What’s the deal with him (Winston) wanting to be called Mr. Clean?

Maria: He doesn’t like to be dirty at all.

Karen: He’s actually high functioning autistic.

Daphne: There were gloves he can use.

Agi: He could do the delicate work of pulling tools.

Stacy: Some people don’t like dirty hands. It’s sensory. Just give it time.

Maria: Last time we were talking about one of our kids getting hands dirty (Winston) but today he was so much better because he was using gloves. He asked to wash hands a couple of times, but was feeling better.

Bahareh: Winston said, “I’m on the farm and I’m actually having a great time. My hands are dirty and I’m having a great time.” It was a great step. He normally doesn’t want to get dirty.

These changes were also found in other students according to volunteers’ reporting.

Meghan: They worked well. In the beginning none of them wanted to get dirty. Now Kate loves it. She loves the compost. She wanted to pick up snakes. She must’ve said five times, “I love getting dirty!

Eunju: I think Mr. P (teacher of the students) was encouraging all the kids to touch the compost. Our girls the first time was reluctant. Then one does it and they all do.

Mariel: They understand that the compost is okay. It smells okay.

Progressive attitude changes toward garden insects

From the volunteers' discussions and my observation, several students changed their attitude toward garden insects. Some of them at first were afraid of insects, but later they became more comfortable with them.

Miro: Boys are really into the bugs. Two were really into the bugs and holding them. We had magnifying glasses and the children took them to observe.

Daphne: I had a request for a magnifying glass. A huge amount of observing. They had their observation channels wide open. Very exciting to see. One was grossed out by the spider, but at the end, thought it was pretty cool…

Hiromi: They were afraid of bees and spiders but Anne talked about what they are for and then they weren't scared any more.

Miro: Our kids really like the bugs. One found 18 bugs. He counted them. He had eagle eyes. Stacy told us how to identify predators…they move fast. The kids used this knowledge after Stacy told us to identify different bugs.

Discussion and Conclusion

There is no doubt that the students' experience in multi-visit field trips in the Landed Learning Project had a positive impact on their informal learning. The impact on student learning includes several dimensions: attitude, behaviour and cognitive.

All the students interviewed had a positive attitude towards working on the farm. Many students changed their view towards soil and garden insects. They did not refuse to get their hands dirty as they did before. They became not so afraid of garden insects, which was influence by the model of their peers and their farm friends. As Sobel (1996) emphasised, what is important is the connecting to nature; therefore, I could claim that the Landed Learning Project was helpful to this point.

In this study, I also found that many students experienced behaviour changes as indicated when they took things home, helped their parents to cook, and planted their own plants in their gardens. Furthermore, students showed that they would like to have ownership of things with which they had become involved. By taking home plants, they kept connections with their discoveries; moreover, continuing to grow the plants in their garden, they could maintain a connection to their experience. Loughran (2002) stated, "The knowledge developed may well be the same, but the process in developing the knowledge is very different. Who is doing the learning really matters" (p. 38). I claim that through these kinds of behaviour changes we can conclude that these are intrinsic motivational changes.

Williams and Dixon (2013) synthesized research about the impact of Garden-Based Learning on academic outcomes in schools. Their results revealed that there were many

positive impacts that directly influenced academic outcomes. Those academic subjects most impacted were science, math, and language. Also frequently measured were positive and indirect academic outcomes which related to social development. A purely academic activity is not a part of the Landed Learning Project of the UBC farm (Mayer-Smith, Bartosh & Peterat, 2004); however, I think that one can interpret the frequency with which the student participants took what they learned in the garden and applied it in their homes with their families as evidence of practical learning. Furthermore, the students expressed their discovery of unfamiliar plants, insects and other creatures. They took this learning beyond the limitation of the garden to including this knowledge when discussing the concept of organic food.

Suggestion

Having reviewed the information from my research, I concluded that the next step could be to look at the long-term impact of such a program. As Falk and Dierking (1997) claimed that all learning should be cumulative and a longitudinal process, my recommendation for future research would be to conduct a series of follow up interviews with the students who participated in the program at five-year intervals. For example, to conduct interviews, which ask students, who participated 10 years ago, 5 years ago and recently, to find out what was the long-term impact with regard to attitudes and actions. Such research would in fact show whether this farm- or garden-based education has long-term efficacy.

Since such a study would not take a lot of time or resources, it is not unreasonable to speculate on how such a program could be expanded or transplanted in another country like China. The fact that China has many cities with large populations means that many people have had little if any experience similar to that had by the student participants in the Landed Learning Project at the UBC farm. Small garden farms for elementary school students and teachers could provide the foundations for a movement towards creating a population that strive to create an urban setting with sources for better quality food and with a cleaner environment.

In March 2012, there was a story about young graduate students who started growing vegetables in Zhihai City in China. They used the organic farms methods they had learned by themselves and developed a reputation for fresh uncompromised organic food. The success of this enterprise suggests that this approach to food production would not only be healthy but

profitable. This means that to encourage young people even elementary school students to learn about nature and growing food can have significant long-term effects in a country like China. Therefore, it is reasonable to suggest that a program like the Landed Learning Project could be tested in other countries, to develop in urban students the kind of connections to the environment that will bring changes to their cities in the future.

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Appendix A: Intergenerational Landed-Learning Experience on UBC Farm Guiding Interview Questions

1. Is there anything that stands out in your mind? Something you will really remember? What? Why?
2. What part of activities at the farm did you like most of all? Least of all? Why? What job/s do you prefer to do?
3. Tell me what you know / think about farms and farming now? What have you learned about farms from this project? What about farming and farmers?
4. Do you think you'd ever like to work on a farm in the future? Why? Why not?
5. Is there a connection between what you do at the farm and what you do in school? Do you think that going to the farm has helped you in school? Do you do any school subjects at the farm? What have you learned at the farm/ at school? about science? Math? Art? Other subjects? Could you give me an example….?
6. What have you learned about environmental issues? Has being at the farm taught you anything more about the environment? Examples?
    a. What have you learned about caring about the land? E.g. caring for the soil (why? How?)
    b. What solutions to environmental issues have you learned by being at the farm?
7. Tell me about your farm friend. Did you enjoy working with them? What did you like or dislike? What did you learn about them? What did you learn from them?

8. What are/is your favourite food(s)? Did being at the farm introduce you to any new food? What was your favorite thing to taste/eat at the farm?
    a. What did you think about the cooking? Was that a new experience for you? Do you cook at home now? More than before? What do you parents say about this?
    b. Do you eat anything new at home since going to the farm?
    c. Do you eat organic food at home?
9. What did you learn about organic agriculture?
10. Do you talk about the farm project at home? What do you tell them? What do they say/feel? What would you tell your friends about working on a farm project?
11. What else have you learned during your visits to the farm?
12. Do you have a garden at home?
13. Would you like to grow your own food in the future? Why? Why not?
14. Do you have any other questions?