UNPACKING YOUR LUNCH:
A QUALITATIVE STUDY OF YOUNG STUDENTS' IDEAS ABOUT FOOD AND NUTRITION

by

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Abstract

This research seeks to understand young students’ ideas about food and nutrition through an environmental education program, the Intergenerational Landed Learning on the Farm Project (ILLP). As a research assistant with this project, I conducted an exploratory study through qualitative lenses by conducting focus groups interviews with 9-10 year old students from a Vancouver elementary school. The interviews were with a class that participated in the ILLP during the school year 2006-2007 and with another class in the same school that did not participate in ILLP. I wondered what the students understand about nutrition and if the students’ experience growing food impacted their understanding about food and nutrition.

Environmental and nutrition education are interconnected and share a common responsibility that is crucial for both the environment and the individual. There is no environmental health without individual health, and vice versa; however, this connection has been poorly explored. Nutrition education traditionally has been closer to the prescriptive approach. Research conducted in nutrition education has been related predominately with children’s dietary intake of fruits and vegetables; this type of research has been conducted without including children’s voices. There is a lack of qualitative research exploring children’s understandings about food and nutrition within the context of informal settings. The increase in school gardening projects makes research conducted and reported in this area imperative.

My findings suggest that students in both classes (ILLP and non ILLP) held similar views about healthy food. Furthermore, the students from this study share similar
ideas about nutrition and food than the ones reported in the literature. Also, my findings suggest that it is important to engage students in more participatory conversations and activities about food and nutrition at the ILLP. Experience alone is not enough to impact their understandings, since children are exposed to a very well-designed marketing industry. The study does provide evidence that the ILLP is meaningful experience that students associate with learning. Through a holistic project like the ILLP that bridges environmental education and nutrition education, I think a different approach to nutrition education is possible.
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Dedication

A mi familia de cuatro, porque las raíces están bien plantadas y en buen suelo y las alas bien calibradas y eso, se los debo a ustedes cuatro: mi mamá, papá, hermana y abuelita Clara.

Gracias por siempre estar para mí y conmigo, para darme ánimos y consejos, y para sacudirme cuando hace falta. Gracias por todo su amor.

To the mysterious open road with all its possibilities, ready or not here I go...
Chapter 1: Introduction to the Study

1.1 Overview

Emphasis in years has been placed on educating students and the general public about healthy eating and nutrition. Motivating the public and encouraging better eating is not simply a trend; it is a real concern for nations and governments around the world. It is well documented that better nutrition is positively correlated with stronger immune systems, less acute and long-term illness and increased overall wellbeing. It is believed that healthy children learn better (Kennedy, Nantel, & Shetty, 2006). Proper nutrition is a prime entry point to ending poverty and a milestone to achieving a better quality of life (News and Information, Nutrition-Friendly Schools Initiative [NFSI], 2006). Healthy people face improved odds to create and access opportunities that break the cycles of poverty and hunger in a lasting and sustainable way.

The health problems associated with malnutrition\(^1\) are critical for all nations. In some cases, these problems are due to the lack of resources; in others, they are related to an abundance of resources and to the excess-consumption of food. In either case, public health promotion and nutrition education are crucial for the construction, development and reinforcement of more adequate patterns of both consumption and nutrition.

\(^1\) The term malnutrition in this thesis is used in its broad meaning, referring to all deviations from adequate nutrition, including undernutrition and overnutrition.
Nutrition-related health problems in children are increasingly significant causes of disability and premature death worldwide (NFSI, 2006). While inadequate nutrition continues to be a major problem in many developing countries, the issues surrounding excess weight and obesity have reached epidemic proportions globally. Both developed and developing countries are seriously affected. In some countries, obesity has become an epidemic while under-nutrition continues to be a problem, creating a double burden of nutrition-related ill health among children as well as adults (NFSI, 2006). According to the results of the 2004 Canadian Community Health Survey: Nutrition (CCHS), there has been a considerable increase in the past 25 years in the percentage of Canadian children and adolescents who are overweight or obese. “This increase was particularly notable among 12- to 17-year-olds, whose overweight/obesity rate more than doubled, and whose obesity rate tripled” (Shields, 2008, p. 2).

1.2 Problem statement

1.2.1 Situating the research

From 2006 to 2009, I participated in the Intergenerational Landed Learning on the Farm Project (ILLP). This is an initiative of the Department of Curriculum and Pedagogy, Faculty of Education, at the University of British Columbia. The project

2 The double burden of malnutrition refers to the dual burden of under- and over-nutrition occurring simultaneously within a population. This phenomenon is not limited to upper-income developing countries, but is occurring across the globe in countries with very different cultures and dietary customs (Food and Agriculture Organization of the United Nations 2006).
brings together elementary school children, educators, university students, community farmers and retired local farmers to explore the manner in which participation in sustainable food growing activities on an urban farm can foster environmental consciousness, respect for nature, and an understanding of food-land issues (ILLP, 2005). As a volunteer working with the children in their food growing activities, and now as a research assistant, I have witnessed that learning in this project is not disciplinary-based; rather, it is holistic, cross-curricular and multisensory.

During the last two years I have been in charge of coordinating the cooking activities in the project (what I refer to as the kitchen project below) during the students’ visits. The “formalization” of this activity was a logical extension of the project and of my involvement. Combining my background as a biologist, my passion for teaching and my enjoyment for food allowed me to realize the importance of food beyond the nutritionist approach. I found myself engaged in cooking activities with students with heterogeneous backgrounds, not only from different cultures but from various social and economic circumstances. This experience has shown me the complex relationship between food and the students’ lives. It also served as a starting point for this study. This study had an exploratory approach: as I am neither a dietitian nor a professional nutrition educator, I created inroads into this topic from a different perspective.

The focus of the kitchen project within the larger Intergenerational Landed Learning initiative is hands-on nutrition education. This “new” aspect of the ILLP deals, in my opinion, with an important combination of issues related with food, nutrition
education, environmental education, science education, social justice and cultural issues, among others.

1.2.2 The problem

People's food choices are complex and they are influenced by many factors. Contento (2007), states that factors such as biologically-determined behavioral predispositions, experience with food, personal and environmental concerns are important in people's behaviors related to food. All of these interact dynamically (Contento, 2008). Children's food choices are probably one of the main concerns for health researchers, teachers and families around the world. Children are, more than ever, exposed to an enormous amount of food-related information. As Contento (2007) noted:

"Everyone seems to be interested in food. Most newspapers have weekly sections on food. Restaurant guides have proliferated, and chefs are now celebrities. Cooking shows are popular on television...the cookbook and food sections of bookstores have grown, and diet books abound (p.1)"

"Clearly, food is not only a necessity but also one of life's great pleasures" (Contento, 2007, p. 1). However, it seems that our excitement over food and the information that we have about eating well has not contributed to improving and transforming our food habits and passing them on to the new generations. Nutrition education is the discipline that addresses any combination of educational strategies designed to facilitate voluntary adoption of healthy food choice strategies and other food- and nutrition-related behaviors conducive to health and well being (Contento, 2007). This definition of nutrition education reflects the views about its purpose and the academic
background of the author. For the purposes of this study, a broader notion of nutrition education will be used. It will be considered beyond the act of disseminating information about nutrients, translating scientific information into accessible phrasing that people can use in their everyday life.

There is more to good nutrition than knowing which foods to eat and having those foods available...the potent influences of biological factors, cultural and social preferences, and emotional and psychological factors make the job of assisting people to eat well demanding (Contento, 2007, p. 5).

Nutrition education is taught in the family, in schools and on the streets. We constantly learn about food, even if we are not aware of it. Most nutrition educators are not nutritionists. Rather, they are committed amateurs: people who go to the trouble of teaching nutrition to children are those who assign value to eating well (Satter, 1999). In the school setting, teachers are nutrition educators; in the family, mothers, fathers and grandparents, among others, teach about food and nutrition. They shape our vision and taste regarding food. On the streets, we learn about food and nutrition through advertising as well as through word-of-mouth. In my opinion, this overlap of information and experiences is one of the greatest challenges that nutrition education faces.

As Gingras (2003) asserts, "The way we teach people about nutrition in academic institutions is incomplete as demonstrated by our nation’s collective, epidemics discontent with food (disordered eating, weight disturbance, nutrition-and marketing-related disease), this is mainly a contentious statement, but one that certainly requires close scrutiny" (p. 7). She proposes a different approach to nutrition education: she
endorses a nutrition curriculum that is bound together with “Relational-Cultural theory, the aesthetic, and critical social theory; one that expands its gaze from the science of nutrition to include the social, cultural, emotional, and political aspects of food and eating” (p.7). This study, titled Unpacking Your Lunch, was conducted with the aim of contributing to a novel approach to teaching about nutrition and food; one in which teaching about food requires more than lessons about nutrients and rules about how and when to eat.

The classroom has been one of the preferred and logical places to teach about food-related concepts and their relationships to human nutrition; however, it seems that the classroom has not been conducive to the transformation of information to action. Why is this? One reason could be that food needs to be understood as more than a biological necessity: eating is also a social practice that reflects our cultural background; food gives us a sense of place and belonging. Generally, teaching nutrition in elementary schools includes the study of food groups in the form of food pyramids (in the USA) and food rainbows (in Canada). Satter (1999) argues that students in the second to fifth grades can sort foods into the right places in the US Food Guide Pyramid. However, they cannot apply these classifications to their daily food choices because that involves abstract thought.

Another reason that classroom instruction related to food issues is ineffective could be that though students are receiving information in the classroom, they are not “experiencing it” or “putting it into use”.
I stress that I am not assuming that knowledge will be a consequence of experience; even if it was, as Dillon (2003) explains, knowledge does not automatically change behaviors. I argue that meaningful experience is a necessary element that can function as a catalyst for learning. Instruction that builds on what students know and care about can serve as a hook to give them ownership of the content (Barton, Koch, Contento, & Hagiwara, 2005).

There has been a growing trend in North America regarding the use of gardening/farming as a part of curricular activities for school age children. As a sound example of this trend, in the state of California, each school has a garden. In 1995, California's State School Superintendent Delaine Eastin “mandated a garden in every school to create opportunities for children to discover fresh food, make healthier food choices, and become better nourished” (Desmond, Grieshop, & Subramanian, 2004). The use of school gardens provides students and faculty with an important opportunity to explore garden-based learning. The educational possibilities that a hands-on gardening or farming project offers to all participants are diverse and numerous.

One of the educational possibilities that emerge from a garden-based education program like the Intergenerational Landed Learning Project is a hands-on nutrition education. Students in the project work during the school year on their own plot, planting and harvesting edible plants; during this time they discover and learn about new plants and new foods. This is an excellent opportunity for the teachers and researchers who participate in the project to engage students in conversations about food and nutrition; they can develop meaningful links to the school curriculum in order to create learning
that transcends the classroom. Garden-based nutrition education puts food into context. In an environment like the ILLP, students can have meaningful experiences with food that they are more likely to remember.

Until recently, the increasing trend toward viewing gardens as teaching tools in schools has not been accompanied by the systematic research that may help us to understand the impact of garden-based education. Few qualitative studies have been conducted in this area. Specifically, qualitative research studies in garden-based nutrition education in teaching practice, program evaluation and students’ learning have not been conducted. Barton, et al. (2005) asserts that there is a dearth of research that documents or explains students’ understandings about food or food-related concepts. It is necessary to conduct research that investigates children’s experiences and understandings about the origins and sources of food, treatment and shipment of food between the farm and the table and the basics of healthy food and healthy eating. Understanding children’s ideas could help teachers, parents and researchers to facilitate valuable and meaningful experiences that help children to create healthy relationships with food. In the near future, this would impact their understanding of these important issues, resulting in better patterns of consumption and, hopefully, a decrease in the medical conditions linked with malnutrition.

1.3 Purpose statement of the study

The purpose of this exploratory study is to understand the perspectives and understandings about healthy food and nutrition of students in fourth and fifth grades: to


explore whether a one-year experience in learning to grow food impacts students’ knowledge and attitudes toward the origins and sources of food, the meaning of healthy eating, and what constitutes healthy food.

1.4 Significance of the study

This study was undertaken in order to listen to what students have to say about their understandings of healthy food. The reality is that we are exposed to an enormous number of influences regarding what to eat and what not eat. As that is not going to change, it is important for students to have a good knowledge base and tools with which they can make informed decisions regarding their own nutrition.

This study contributes to the understanding of the complex role that food plays in our lives and the complex relationship with have with it. Furthermore, it supports and extends qualitative studies in the field of nutrition education, where studies conducted to date have been in informal settings such as gardens and farms. This study also highlights important questions and issues that need to be addressed in future studies.

1.5 Overview of methodology

I employed a qualitative methodological approach in the conduction of this study. This allowed me to listen to students’ statements about their understanding of food and food-related concepts as well as their experiences at the farm. The use of a qualitative methodology is consistent with my interest in acquiring a rich and in-depth understanding
of students' perceptions and ideas about food; qualitative methodology also underscores the importance of the informal setting in the area of nutrition education.

The primary method used for data collection was that of focus group interviews conducted at the students' school. This was done at the end of the 2006-2007 school year. The interviews were conducted at schools during the students' lunch breaks. My objective in adopting this approach was to engage students in a conversation *in situ* about what they were eating for lunch and to encourage students to articulate their knowledge about food and nutrition. The data analysis included transcription, categorization and interpretation of the information.

1.6 Overview of the thesis

This first chapter of the thesis provides a broad introduction to the study. Chapter Two provides a review of the current state of knowledge in the literature that is relevant to this work. Chapter Three describes the methodology of the study, research questions, methodological approach, study context and an overview of the theoretical framework for this study. Chapter Four consists of the study's findings and discussion. Chapter Five, the last chapter of this thesis, provides the final thoughts and conclusions that emerged from this study. The limitations as well as recommendations for future research are part of this last chapter.
Chapter 2: Review of the Related Literature on Garden-Based Nutrition Education

2.1 Overview

Common to all the studies that I examined in the course of writing this thesis is a concern for children’s health. As a society we have the responsibility towards children to generate opportunities that allow them to have the best nutrition and health possible. Children need to be literate about food. In my opinion, this is the only option that we have to fight health problems such as diabetes, obesity, eating disorders, etc. These are making our children sick and they are closely related to food choices. In the near future, these children will become adults who will teach another generation about food and nutrition; therefore the actions that we take now will significantly impact future generations. Through nutrition education, we can achieve such an impact. Nutrition education not only takes place in schools. It is also taught in and by the family, the media, peer groups, etc. Probably it is this particularity and these multiple influences that make it challenging to transform children’s perceptions about food and nutrition.

While many studies indicate the urgency to improve children’s health, the proposed ways to approach the problem differ among authors. In order to provide a panoramic view of the research that has been conducted in the area of garden-based nutrition education, the first section of this review of the literature focuses on defining nutrition education. The main focus of this literature review is the relevant literature in the area of garden-based nutrition education.
2.2.1 What is nutrition education?

There is no unequivocal definition of nutrition education. Different views about its purpose provide us with diverse definitions. Contento (2007) discusses three different definitions of nutrition education depending on its purpose. The first one is what she calls the information dissemination approach, which views nutrition education as the process of translating the findings of nutrition science for various audiences using methods from the fields of education and communication (Contento, 2007). The second approach to nutrition education, which Contento (2007) calls: “Facilitating behaviors conducive to health”, involves much more that simply imparting food and nutrition information. In Contento’s (2007) words:

Under this approach nutrition education facilitates behaviors that are conducive to health by focusing on the personal motivations and competence, interpersonal interactions, and environmental factors that influence individual and community patterns of behavior (p. 12).

The third approach to nutrition education takes into consideration and focuses on modifying the environmental factors that are involved in the context in which food choices are made. This is a more comprehensive approach, which encompasses factors such as the social environment. Under this approach behavioral strategies that promote changes in individuals are not as important as those that are directed towards changing the broader institutional and social contexts.
Contento’s definition of nutrition education takes into consideration factors stemming from the three different approaches: "Any combination of educational strategies designed to facilitate voluntary adoption of food choices and other food-and nutrition-related behaviors conducive to health and well being" (p. 15).

Nutrition education’s early roots were in home economics, which used an ecological approach to improving the quality of people’s lives (Travers, 1997). However, this area of knowledge was heavily influenced by nutritional science, which reflects the fact that positivism was the philosophical influence for health professions during the 20th century (Travers, p. 57, 1997). Within this positivistic framework nutrition education has focused on teaching people how to apply nutrition science principles to food selection (Contento, 1981). During the 1980’s researchers in the emerging discipline of nutrition education realized that the behavioral science (Psychology) and social science could help disentangle the complex problematic that arises from and within nutrition education.

Students’ daily intake of fruits and vegetables has been one of the prevalent concerns for research undertaken in the area of nutrition education. Fruit and vegetable consumption is an area in the spotlight due to the low levels of such consumption among children and adolescents in the United States (Jones, 2006). Here I would like to point out an important trend: almost all the articles related to garden-based nutrition education that I found during my research originated in the United States.
2.2 School-based nutrition education

The issue of students’ nutritional knowledge has been examined by different authors (Contento, 1981; De Bourdeaudhuij & Van Oost, 1998; Hart, Bishop, & Truby, 2002; Lyte, & Achterberg, 1995; Ross, 1995; Robinson, 2000; Smith & James, 1980; Watt & Sheiham, 1997). The studies conducted by these authors have used different methodological approaches and methods to explore what students know about food, nutrition and related topics.

The classroom has been the preferred setting of nutrition educators to teach children about food choices and healthy food. Research conducted in the school setting has been oriented towards designing nutrition curricula that address these issues and is meant to be used in the classroom. Contento (1995) in research review that spans from 1980 to 1995, found 43 nutrition education intervention studies with school-aged children. She categorized these studies into two groups: 1) Studies addressing general food and nutrition issues. These examined effects of interventions in knowledge, attitudes and behavior and 2) studies that focused specifically on producing behavioral change. These examined the impacts on behavior, as well as several potential mediating variables, such as self-efficacy, behavioral skills, and behavioral intent (Contento, p.279, 1995). These two groups of studies are heavily influenced by the nutritionists’ perspective (medical approach), which hitherto has had the most impact on the research conducted in nutrition education. Another characteristic is the type of language employed, which reflects the paradigm that has been prevalent in these types of studies, and that is closer to the medical disciplines than to the educational one. Travers (1997) asserts so when she
points out that “nutrition education research and practice influenced by positivism gives precedence to the technological advances in nutritional and behavioral sciences”.

Although this literature review is mainly concerned with studies that examine the use of gardens as educative spaces for nutrition education, I did a search for articles that report students’ ideas, attitudes, and perceptions about food and nutrition as well as their understandings of healthy food. The articles that I found use both quantitative and qualitative methodologies and all were conducted in the school setting. The literature in this area is not broad. In total I found twelve studies, three of them used a quantitative approach whereas the other nine adopt a qualitative one. Those studies that made use of a qualitative approach provided me with a deeper understanding of students’ voices. Table 1 provides an overview of these studies and their results. Due to the small amount of articles, this table is an effective way to present the studies.
Table 1: Overview of articles that report children’s ideas about food, nutrition and healthy food (adapted from Jones, 2006).

<table>
<thead>
<tr>
<th>Article</th>
<th>Target audience/sample</th>
<th>Theory/Methodology</th>
<th>Intervention</th>
<th>Results</th>
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<tr>
<td>Contento, 1981</td>
<td>34 Children, 5 to 11 years in preoperational and concrete</td>
<td>Piagetian theoretical framework/qualitative. Individual interviews based in the</td>
<td>Not an intervention. This study was designed to provide a description of</td>
<td>Vitamins for all the preoperational and almost all the concrete operational students were pills that make you stronger and healthy. Only 6 students mentioned words such protein, vitamins, minerals in describing the transformations that food undergoes in digestion. Students believed fruits, vegetables, and milk were good for them; but they had no idea why. When asked to name foods “good for you” concrete operational children list fruits, vegetables and meat. Candy and dessert were classified for students as not good for you. Most of the children said that food made you strong, healthy or made you grow. Pizza and pasta were what they liked the most. Chicken, hamburgers and hot dogs were in second place and donuts and pancakes were the third ones. Foods that they dislike were specific vegetables and liver. In summary children did not see any connection between the concept of nutrients as components of food and their personal experience of the eating process and the effects of food in their bodies.</td>
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<td></td>
<td>operational years.</td>
<td>semi clinical interview (open-ended questions) procedures use by Piagetian</td>
<td>how children from the preoperational and concrete operational years think about food and snacks, the changes food undergoes, and the effects of food in their bodies.</td>
<td></td>
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<td></td>
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<td>researchers</td>
<td></td>
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<tr>
<td>Domel, et al, 1993</td>
<td>301 students in grade 4-5 in two schools in Richmond County,</td>
<td>Social marketing approach and reciprocal determinism with social cognitive theory/</td>
<td>School-based curriculum (Gimme 5) specifically to increase fruit and</td>
<td>1) Younger generations are following the pattern of low F&amp;V consumption established by the older generations (p. 347). 2) Gimme 5 significantly increased preferences for fruits but not for vegetables 3) Gimme 5 failed to increase F&amp;V consumption overall among 4th and 5th grade students. 4) Authors suggest that there may have been a qualitative, but not quantitative, effect of Gimme 5 on F&amp;V consumption.</td>
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<td></td>
<td>Georgia, USA.</td>
<td>Qualitative and qualitative</td>
<td>vegetable (F&amp;V) consumption among 4th and 5th grade students the name. This</td>
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<td>paper describes the development and pilot-testing of the curriculum, including its impact on F&amp;V consumption, knowledge and preferences. Strategies included recipe preparation and taste-testing of F&amp;V snacks in the classroom. They conduct focus group-interviews.</td>
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<td>Article</td>
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<td>Ross, 1995</td>
<td>Primary school in Edinburg, UK. 48 Students ages 10-12 years old. Prominent white with only a few from ethnic minority backgrounds.</td>
<td>A qualitative methodological approach was adopted using focus groups and observational techniques.</td>
<td>No intervention, the study was exploratory into students’ ideas.</td>
<td>1) Food choice was not determined by the health attributes of food but rather that values of preference, play, socialization and convenience were given a higher priority than health by the children when making food choices. 2) “Healthy” foods were found to be associated with the concept of proper meal and homemade foods.</td>
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<td>Seaman, Bower, &amp; Fleming, 1997</td>
<td>103 students from 5 secondary schools (13-14 years old). Edinburg, UK.</td>
<td>Quantitative. The authors use a questionnaire to assess nutrition knowledge and attitudes towards healthy eating. Children also completed diet diaries during 7 days. An interesting characteristic of this study is that they use a control group from a school that had a healthy eating policy.</td>
<td>No intervention.</td>
<td>1) High incidence of “like a lot” was found for chocolate, chips, crisps and fizzy drinks items which are relatively sugar or fat rich. 2) High “like” profile was also shown for pasta, brown bread and beef burgers. 3) Fruit, vegetables, and fish showed a greater incidence of dislike. 4) Food consumption data indicate that many of the respondents were regularly consuming foods that were high in sugar, salt and fat and low in vitamins, minerals and fiber. 5) Not important differences between girls and boys. 6) Authors reported an outstanding difference in eating patterns between the students in the school with healthy eating policy and the other schools. 7) Levels of nutritional knowledge identified were good.</td>
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<td>Watt, &amp; Sheiham, 1997</td>
<td>81 adolescents aged 13 or 14 years from four schools in Camden, North London, UK. participated in this study.</td>
<td>Qualitative and quantitative methods were used in this study, however only the qualitative results are discussed in this paper. Semi-structured individual interviews in which the meaning of and associated beliefs concerning foods were examined.</td>
<td>Young people’s perceptions of food were explored in this research project. There was intervention</td>
<td>Findings indicate that many young people conceptualized and classify foods into either “healthy” or “fast” foods. The social dimension of eating is also one of the results from this study, level of accessibility of certain foods to different social groupings. “Fast foods” were generally considered to be highly acceptable to young people. “Healthy” food was linked to the adult word; overall healthy food appeared to be largely unappealing to young people.</td>
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<td>Lytle, Eldridge, Kotz, Piper, Williams, &amp; Kalina, 1997</td>
<td>141 students grade K to 6, from two suburban school districts near Minneapolis and St. Paul Minnesota.</td>
<td>Qualitative, focus groups and one-on-one interviews.</td>
<td>One of the activities was to ask children to discuss their opinion of &quot;good and bad foods&quot;. This research was conducted as a part of a formative evaluation to develop meaningful nutrition messages for school-aged children.</td>
<td>Younger children freely used terms such as &quot;low fat&quot; or &quot;low sugar&quot;, they had difficulty in naming three foods within those categories. Almost all the students thought that there were good and bad foods. Only a few students volunteered their opinion that eating &quot;bad foods&quot; once in a while was okay. Fruits and vegetables were mentioned as good foods across all age groups. Bad foods were the ones that are bad for your teeth. Contain grease and fat, too much sugar, salt, caffeine.</td>
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<td>Noble, Corney, Eves, Kipps &amp; Lumbers, 2000</td>
<td>123 students aged 9 to 11 years, from 14 primary schools in South East England.</td>
<td>Qualitative and quantitative</td>
<td>Using photographs of foods commonly served at school lunches, children were asked to rank the foods in order of preference and the according to their perceptions of healthiness of the foods and give their reasons in each case.</td>
<td>Children had a clear perception of the healthiness or otherwise of the foods. However, understanding of the relationship between foods or nutrients and health was occasionally evident, as was the idea of moderation or balance. Some children perceived healthiness as the absence of fat, others in the presence of vitamins. It was found that while the foods chosen for the &quot;healthy&quot; meal were chosen less frequently for the &quot;preferred&quot; meal. Favorite foods were chips, sausages, fish fingers, pizza, ice cream, spaghetti.</td>
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<td>Dixie, Sahota, Atwal &amp; Turner, 2001</td>
<td>300 students aged 9 to 11 years, from 10 schools in Leeds, England.</td>
<td>Qualitative: focus groups, and quantitative, students were weighed and measured at the beginning and at the end of each year.</td>
<td>The &quot;Apples&quot; project, a program of nutrition activities that had the aim of healthy eating and physical activity, and therefore influence obesity and overweight in children aged 8-11 was implemented in the schools were this study was conducted.</td>
<td>The results of the focus groups showed that the students understanding about contemporary nutrition education messages about the importance of balance and moderation, and have some understanding of the idea that there are not healthy and unhealthy foods, but healthy and unhealthy diets. Children had a simplistic view of the relationship between fat in the diet and fat in the body.</td>
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<td>Hart, Bishop, &amp; Truby, 2002</td>
<td>114 primary school students aged 7-11 years from Surrey, UK.</td>
<td>Qualitative methodology was employed. Focus groups.</td>
<td>Not an intervention. Aim of the study was to investigate the nutritional knowledge and understanding of students. This information will be used to provide direction for future local dietary and nutritional education interventions.</td>
<td>Across all the focus groups food-health links were the most popular justification given for good and bad foods. Approximately one-third of the reasons given for food's classifications were incorrect. Marketing was also uncovered as an important educational influence with an awareness of the negative aspects of popular foods shown. Children's understanding and use of food grouping schemes was found to be inconsistent.</td>
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<td>Kandiah, &amp; Jones, 2002</td>
<td>187 fifth grade students from two urban elementary public schools located in a large Mid-Western metropolitan city, US. Control group was 97 students and experimental 90 students.</td>
<td>Quantitative. The groups that participated in this study completed a valid and reliable nutrition knowledge questionnaire (pre and post-test) and kept three day food records.</td>
<td>A three week school based nutrition education program. 45 minutes of nutrition education, 4 days a week for 3 weeks.</td>
<td>In the experimental group there was a significantly greater increase in nutrition knowledge and significant change in compliance in meeting the dietary guidelines and the food guide pyramid's recommendations.</td>
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<td>McKinley, 2005</td>
<td>106 children aged 11-12 from 11 post primary schools in Northern Ireland and England</td>
<td>Qualitative. Focus groups</td>
<td>Not an intervention. To gain an insight into children's views about food and nutrition.</td>
<td>Major barriers to healthy eating were taste, appearance of food, filling powder, time/effort, cost, choice/availability/risk rebellion, and body image/weight concerns. There was a difference between girls and boys, the former were focus primarily on their appearance whereas boys appeared to be more influenced by sport. Children had a tendency to categorize foods as either “good” or “bad”, “healthy” or unhealthy”. F&amp;V were seen as “healthy” eating.</td>
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<td>Stewart, Gill, Treasure, &amp; Chadwick, 2006</td>
<td>74 students aged 6-11 years from 4 local primary schools Cardiff, Wales</td>
<td>Qualitative, semi structured one-to-one interviews</td>
<td>Not an intervention. Study aim to understand how 7 and 11 years old think about information they received about food and nutrition and how this affects what they eat and what they preferences are.</td>
<td>Children hold contradictions about food. These are both sophisticated and complex, incorporating notions of “bad” and “good” related to food. Knowledge levels are not poor, but they are applied inconsistently and selectively. Children hold simplistic, singular notions of the health consequences of food. For example: sugar rots teeth, fat affects weight, fruits and vegetables are healthy. There was some evidence of brand loyalty and marketing responsiveness.</td>
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<td>Zeinstra, Koelen, Kok, de Graaf, 2007</td>
<td>Three age groups were included in the study: Eight 4-5 year old children, eight 7-8 year old and twelve 11-12 students from a primary school in Wageningen, The Netherlands.</td>
<td>Qualitative, focus groups and duo-interviews. Piagetian based study.</td>
<td>Not an intervention. Authors explore the relationship between cognitive development and children’s preferences. They argue that this relationship can and should impact interventions aimed at changing food preferences and intake</td>
<td>Children’s preferences expanded and increased in complexity as they moved to a higher age bracket. The most important determinants for liking and disliking shifted from appearance and texture attributes in 4-5 years old towards taste attributes in 11-12 years old. Their understanding of health improved as they grew older.</td>
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The studies mentioned above are concerned with students' understandings, perceptions, and attitudes towards and about food, healthy eating and nutrition. These studies illustrate an interesting trend in the use of focus groups to listen children's voices. Authors like Stewart, et al., (2006) point out the pressing need to conduct research with the children rather than on them. The advantages and disadvantages about using focus groups as a method to gather in depth data is discussed in several of these papers (Ross, 1995, Hart, et al., 2002). These studies contribute, directly and indirectly, important messages regarding the use of focus groups with children. These reflections could contribute to the scattered and limited literature about conducting focus groups with children. These contributions are very relevant to novice researchers, like the author of this thesis.

Looking across the studies other trends are evident. The authors of the articles reported in Table 1 used qualitative, quantitative and mixed methods to conduct their research. There are qualitative studies (Contento, 1981; Dixie, et al., 2001; Hart, Bishop, & Truby, 2002; Lytle, et al., 1997; McKinley, 2005; Noble, et al., 2000; Ross, 1995; Stewart, 2006; Turner, 2001; Watt, & Sheiham, 1997; Zeinstra, et al., 2007) that are designed to gain knowledge about children's conceptualizations regarding food and nutrition. Quantitative studies were found; but only the study by Seaman, et al. (1997), which used a quantitative approach to analyze the data obtained through questionnaires, provided information about students' knowledge. This study was not an intervention. The survey that the authors used was planned to establish nutritional knowledge, attitudes and beliefs about healthy eating and their patterns of food consumption at lunch time on
schooldays. The other quantitative study, by Kandiah and Jones, (2002), reported on the impact of a three week school based nutrition education program on the nutrition knowledge and healthy food choices of 5th grade students. The results reported in this study are hard to analyze, and the article does not provide the reader with enough information. Few studies employed, or reported the use of mixed methods. Two studies that did were those by Domel, et al. (1993) and Dixie et al. (2001). These studies had very different outcomes. Domel, et al. (1993) reported that their intervention “Gimme5”, a curriculum that was taught over the course of six weeks, was successful in significantly increasing preferences for fruits but not for vegetables. However, their intervention failed to increase overall fruit and vegetable consumption among 4th and 5th grade students. The authors suggested that there may have been a qualitative, but not quantitative, effect of “Gimme 5” on vegetable consumption. Domel, et al. (1993) concludes in their study that the increase in consumption of fruits and vegetables appeared to be a problem that resisted school-based nutrition education. Hence, they suggested that a more comprehensive intervention, directed to the whole school environment (including curriculum, school lunch, and even school counseling) and the community might be necessary to increase fruits and vegetable intake among 4th and 5th grade students. The Dixie, et al., (2001) study’s results of the focus groups showed that the students had understanding about contemporary nutrition education messages regarding the importance of balance and moderation, and also had some understanding of the idea that there are not healthy and unhealthy foods, but healthy and unhealthy diets. They found that children had a simplistic view of the relationship between fat in the diet and fat in the
This study reported an intervention "Apples" project that lasted 2 years. The project's aim was to evaluate if a program of nutrition activities could affect healthy eating, fatness and physical activity, and therefore influence obesity and overweight in children 8-11. The Dixie et al. study is noteworthy as it used both a quantitative and a qualitative approach in a synergic and generative way. Both studies demonstrate important efforts that involved professionals such as teachers, dietitians, nutrition educators, psychologists, pediatricians, among other professionals as well as parents. The implementation of a program that has as the objective to influence children’s knowledge and behavior, must address “all” the aspects that converge in food issues.

Important findings are reported in Contento’s study (1981). She pointed out the necessity to explore the relationship between cognitive development and children’s preferences. Under the same Piagetian approach, the study conducted by Zeinstra, et al. (2007) argues that the relationship between cognitive development and children’s preferences can and should impact on interventions aimed at changing food preferences and intake of foods. This Piagetian approach has been examined but it has not necessarily been reflected in the type of interventions designed and implemented by nutrition educators. An important difference between these two studies is that Contento’s study did not classify students as preoperational or concrete stage based on their age. She classified them on the basis of their cognitive development. Zeinstra, et al., (2007) classified students as preoperational or concrete stage based on their age. In my experience working with students that are 10 years old, the differences in cognitive development among students is important; some of them demonstrate a level of cognitive
development appropriate for their age and some of them do not. Thus, Contento’s effort
to classify students according to their age and their specific stage of cognitive
development seems to be worth the added effort.

Studies like the ones conducted by Lytle, et al (1997), Seaman, Bower and
Fleming, (1997), have shown that there is a gap between the information about nutrition
education that the students have and their choices regarding food. Students know what is
healthy and what is not, but they have been choosing the unhealthy foods. Driver,
Squires, Rushmore, and Wood-Robinson, (1994) assert when they wrote, in what is today
a classical reference about children’s ideas that:

Food is necessary for life and activity but the meaning of food is not
consistent in children’s thinking and they have different concepts of food in
different contexts. Pupils of all ages define food as material to promote
growth and health and activity. They do not recognize it is as material to
become part of their bodies in growth, or as a source of energy (p. 43).

Consistent with the statement by Driver et al. (2004), that children from an early
age know that what we eat consists of components called “proteins” “fats”, vitamins” and
“minerals” but they do not understand the respective functions of these substances, and
do not recognize them as a groups of elements, are the findings reported in Contento’s
study (1981). For all the preoperational and almost all the concrete operational students
that participated in her study, vitamins were pills that make you stronger and healthy. The
gap that exists in children’s knowledge and actions could be part of a cognitive
developmental characteristic that was probably potentiated by teaching. The latter could
be due to the fact that nutrition education has not been developed with cognitive appropriate material. In my opinion, the gap may be due to the many complexities that arise in food issues than surpasses the classroom setting.

All the articles that I reviewed were relevant and useful in guiding my study. Even though they took place in different countries the results are similar. This suggests that some of the issues could be generalized, although some issues need to be addressed in their own realities. Overall, however few studies asked children what they think and what they understand about food. This is a significant gap in the research literature that needs to be addressed.

2.3 Garden-based learning

Unpacking Your Lunch is a qualitative exploratory study which arises from my experience as a researcher assistant in the Intergenerational Landed Learning Project. This project takes place in an urban farm, and it aims to engage students in learning through hands-on activities. Gardening is the main activity in which all the students participate. Teachers and the project's staff accompany the students in this experience, guiding the learning activities. This is a program that uses garden-based learning as an approach to engage students in agriculture and food as the link between a healthy environment and human well-being (ILLP, 2005).

A growing number of studies (Morris, Brigs, & Zidenberg-Cherr, 2000; Morris, Neustadler, & Zidenberg-Cherr, 2001; Morris, & Zidenberg-Cherr 2002; Ozer, 2006; Poston, Shoemaker, & Dzewaltowski, 2005) point out the opportunity that out-of-school
settings provide to engage students in health issues. These studies link gardening activities in farms, gardens, and school gardens to nutrition education. In this part of the literature review I will give an overview of what is garden-based learning as an introduction for garden-based nutrition education.

Garden-based learning can be defined simply as an instructional strategy that utilizes a garden as a teaching tool; however in the opinion of Desmond, Grieshop, and Subramanian (2004), this definition is misleading, because it does not take into account some of the powerful elements of the garden experience. It overlooks the relationship of these experiences to educational reform and to the transformation of contemporary basic education from a sedentary, sterile experience to one that is more engaging of the whole child. In addition, this definition, in the opinion of the authors, misses the elements of the garden experience that contribute to ecological literacy and sustainable development.

Garden-based learning pedagogy is based on experiential education and environmental education. Experiential education is concisely described by the Association for Experiential Education (2002) (as cited in Desmond, et al., 2004) as “a process through which a learner constructs knowledge, skill, and value from direct experiences” (p.22). In this approach hands-on learning has an intrinsic value. Another characteristic about experiential education is that it is based on the motivation of the learner. This makes learning a relevant and meaningful experience that will transcend the immediate experience. This approach is clearly focused on engaging the learner as the central figure in the educational experience and allows individual and social constructivism.
Desmond et al. (2004) suggest that while experiential education and project based learning offer excellent strategies or pedagogies, they require a contextual framework or thematic structure in which to operate. Environmental education, and more specifically garden-based learning, can provide that context or thematic focus. The authors remind us that the practice of garden-based learning must consider rigorous guidelines, procedures and practices. To be truly effective, garden-based learning programs must be tied to a comprehensive and cohesive educational plan/program or garden curriculum that is implemented across grade levels and ideally is tied to local, state, or national education standards or needs.

Desmond’s, et al. (2004) report is an ambitious compilation of studies around the world that have been conducted using a garden-based learning approach. The report aimed to define the discipline and practice of what constitutes garden-based learning. The authors were motivated by the fact that combining garden work with basic education should be logical and natural. Based on their analyses of significant garden-based learning programs and a review of the literature, as well as the historical role of garden-based learning, they suggest that garden-based learning can be a unique and effective strategy to be used in basic education to introduce an experiential component in support of the traditional curriculum.

Desmond, et al. (2004) find that garden-based programs are, in some settings, the educational curriculum itself, whereas in others they support or enrich the curriculum. According to the authors there is no universal model of garden-based learning that can be
applied to every community. Each culture or community must design a plan that addresses the needs of their learners and educators (Desmond, et al., 2004).

The aspects in which garden-based learning can contribute to basic education are not only the ones espoused by the mandated curriculum. Aspects like academic performance, ecological literacy, school environment and culture, community linkages, nutrition and health, and vocational education, can be impacted (Desmond, et al., 2004).

In summary garden-based learning “makes a unique contribution not replicated in other pedagogies. It engages the student in a stewardship relationship with other living organisms and teaches not only the science of life but also the interconnected nature of the web of life and how everyday actions can have profound effects on the long-term health of the system” (Desmond, et al., 2004, p.11).

2.3.1 Garden-based nutrition education

In recent years gardening in schools has received revitalized attention as a way to teach not only science and math but also nutrition. “This renewed attention to gardening has set the table for a number of nutrition education programs that address such issues as childhood obesity and the consumption of fruits and vegetables (domains that reinforce each other)” (Jones, 2006, p. 7).

There is a popular movement in the United States, predominately in California schools, to connect the school garden with the school cafeteria (school food service), and with local farms that produce the food. Increasingly school gardens are being used as vehicles to teach the food cycle, nutrition, and culinary science. This reflects a serious
investment in California in using the garden to change the attitudes and eating practices (thus nutrition) of students. The growing tendency in the use of gardens as educative tools is also reflected in the number of studies of garden-based nutrition programs that have been conducted and reported in the United States. Most of these studies however examine programs conducted in a single state, California. The use of gardens as a vehicle to promote learning is not new. In 1972, Boyer was already pointing out the importance of gardens as spaces to learn about nutritional meals. Boyer proposed a gardening approach to teaching better food and nutrition habits for program families. She argued that the garden experience was not only a nutritional food experience; it was a delightful family experience. Boyer concluded her study with a reflection that illustrates the experience: “The 1200 square foot plot of ground did indeed turn out to be much more than just a garden. It was a learning experience that has touched the lives of many people in Olmsted County” (p. 9).

While Boyer’s study hinted at the promise of learning about nutrition through gardening, the article was short and lacked detailed information about the educational experience. Another study that describes a program that improved attitudes towards healthy food was written by Cavalier (1987). This study reported a nutrition education program where the children grew their own food in school gardens, and suggested that, as a result, they learned to genuinely like foods that are “good” for them. These studies illustrate that the connection between the garden and nutrition education has been the subject of research. However, only a small number of studies to date have focused on nutrition education in the out-of-classroom setting. The majority of studies reported have
been conducted in schools gardens. These are not considered to be out-of-school settings, because the gardens are on the school grounds, but they offer a different learning experience than what happens under the traditional boundaries of the classroom setting. Since there is not much literature reported in this area, the studies that I reviewed include a variety of ages, mostly the studies have been conducted in elementary school however, there is some that have been conducted with Kindergarten and High school students.

Garden-based nutrition education is a relatively “new” approach. Classrooms in schools have been the preferred setting to teach about nutrition issues; however this approach has had limited impact on children’s understanding, or the translation of knowledge into action. Morris, Briggs, and Zidenberg-Cherr (2000), suggest that the field of nutrition education is in need of an innovative approach. They believe that incorporating school gardens into the curriculum is an important step to fight the nutrition education crisis.

Garden-based nutrition education is a promising approach to engage students in food issues. Using hands-on activities, like plant and harvest, cook and taste, students are involved in the process of the food cycle. These activities that engage students in a holistic experience are an important part of teaching and learning about food and nutrition.

Briggs, Morris and Zidenberg-Cherr (2000) introduced the issue of nutrition education and gardening. They based their study on the fact that a limited number of nutritional education programs have been shown to improve dietary choices and self reported health knowledge and behavior by school-aged children, at least in short term
results. They describe past trends in the US educational system in the area of nutrition education and the failure of this education to achieve important results in improving the health of the students.

As an innovative approach, they advocate for the incorporation of gardens in the school environment because they think that this type of experiences can reinforce nutrition lessons, and have a long term impact in the students’ life. They point out that very few well-designed studies have been conducted to determine the effect of gardening on the health-related behaviors of children. They take the lead and report in a subsequent study (Morris, Neustadler, & Zidenberg-Cherr, 2001) a pilot initiative undertaken to evaluate the feasibility of implementing and evaluating a garden-enhanced nutrition educational program within the school setting. The title of the article: “First-grade gardeners more likely to taste vegetables” says a lot about the results. The authors use quantitative and qualitative methods for the study. They conduct one-on-one interviews; and use questionnaires and conclude that it is feasible to conduct a garden-enhanced nutrition education program within the constraints of a school year. Although the experience did not improve the children’s ability to visually identify food groups, the students who grew the vegetables in their gardens were more willing to taste certain vegetables. This study is very thorough but does not report on findings from the qualitative part of the study. In a third article (2002), Morris and Zidenberg-Cherr hypothesize that nutrition lessons in combination with planting and harvesting vegetable garden would have a greater effect on children’s vegetable preferences than nutritional lessons alone. The objective of this third study was to evaluate the effectiveness of a
comprehensive one-year program designed to improve the nutrition knowledge and vegetable preferences of upper-elementary school-aged children. The study used a quasi-experimental design and the results indicate that exposure to a nutrition education lesson significantly improved the nutritional knowledge of all the students. The students that had experience at the garden also increased their preference for vegetables to which they were not directly exposed. An important issue that this study explored is that most of the improvements were retained six months after the completion of the lessons. This is the only study that reports a follow up.

A similar program was reported by Cason (1999) who describes a program implemented among kindergarteners in South Carolina. Students participated in gardening and nutrition education to learn to identify nutritious snack foods, identify fruits and vegetables, try new fruits and vegetables, help prepare fruits and vegetables, and acquire healthy behaviors. In this study kindergarten teachers and faculty from Clemson University collaborated in the planning, development, and implementation of a comprehensive nutrition education curriculum (that involved a school-based garden) for kindergarten students. Quantitative and qualitative evaluations were used to measure the success of this project. Among the participants of the project the correct identification of fruits and vegetables increased dramatically (43% for vegetables pre- and 86% for vegetables post-). There was also a 69% increase in willingness to taste fruits and vegetables (Cason, 1999). Unfortunately the article does not provide information about the qualitative data findings, however the author does mention that “student comments may have provided the most insight into the success of the Kindergarten” (p. 236).
Graham and Zidenberg-Cherr (2005) assessed elementary school teachers’ perceived attitudes and barriers associated with school gardens, as well as the purpose and use of gardens in schools, specifically in relation to the link between gardens and nutrition. The authors sent a questionnaire to 1665 teachers, and 592 questionnaires were returned. Using quantitative methods to analyze the survey data they find out that nutrition was taught with the use of the garden by 47% of responding teachers. This suggests there is interest and a need for resources to support the teaching of nutrition using a gardening component. Further, the results indicate that there is the need for teacher training in relation to gardening and nutrition.

Common to the three studies by Morris, Briggs, and Zidenberg-Cherr, (2000), Morris, Neustadler, Zidenberg-Cherr, (2001), and Morris and Zidenberg-Cherr (2002), is the theory used to frame their work: the social cognitive theory (SCT). They used SCT-based materials that focus on three factors that are believed to be involved in altering health-related behaviors: personal, behavioral and environmental. That means that in order to arouse a change in the individual behavior, the program needs to alter all the three factors. The use of SCT is the predominant one in the studies that I review, not all

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3 I am not going to delve into this theory, because is not the main focus of this section, however it is important to say that Social Cognitive Theory is an Theory developed by Bandura a psychologist. This theory is applied in many different arenas among them: public health and education. Social Cognitive Theory (also called social learning theory) focuses on the role that observation and modeling play in children's learning and development and emphasizes the importance of self-perceptions and expectations as factors in motivation (Bandura, 1982; 1986; Schunk, 1989). By and large, social cognitive theorists focus more on general principles of learning and motivation than on how learning and motivation change over time.
the studies reported which theory frame their study, however the ones that reported it refers to the SCT.

Another quantitative study is the one written by Poston, Shoemaker and Dzewaltowski, (2005). This one caught my attention because their results differed significantly from the ones quoted before, also because it reports on a program in an out school setting. In their study, they compare two programs: a standard nutrition program called Professor Popcorn that is a curriculum that consists of three lessons, which range in length from 30 to 60 minutes. Nutrition concepts, sample recipes, and nutrition, food safety and physical activities are included in each lesson (Poston, et al., 2005) using lessons from Junior Master Gardener: Health and Nutrition from the Garden. This program focuses on teaching nutrition through gardening. Eight lessons from the program curriculum were chosen to provide a mixture of gardening and nutrition lessons (Poston, et al., 2005). Both programs were compared to investigate their influence on nutrition knowledge, improving fruit and vegetable preference, and improving self-efficacy in gardening and eating fruit and vegetables in an out-school-setting. Knowledge, preference, and self-efficacy measures were obtained at the beginning and end of the program. The authors state that no previous studies had evaluated a program that incorporated gardening with nutrition lessons and that was delivered in out-of-school-settings. This study had a quasi-experimental design and found that students in both programs did not improve their nutrition knowledge, which is inconsistent with current literature (Morris, & Zidenberg-Cherr, 2002) that indicates that garden-enhanced nutritional programs increase students’ vegetable preference. It is not clear in this paper
which one was the out of school setting. My understanding is that part of the study took place in summer camp, but this information it is not clearly stated in the paper.

Another quantitative study (O’Brien, & Shoemaker, 2006), reported for the same research group above have similar findings. Through an after-school gardening program, called: “Junior Master Gardener: Health and Nutrition from the Garden” that consisted of eight lessons of gardening and nutrition education with 30 minutes of gardening time in each lesson, they taught this in order to determine the effect it had on increasing children’s nutrition knowledge, fruit and vegetable preference, and improving children’s self-efficacy and outcome expectations for gardening and consumption. The results were that there was no change in vegetable preference. The authors reflect on their results and assert that the length of their program could be one of the reasons for outcomes different from research by Morris and Zidenberg-Cherr (2002) who reported changes in vegetables preferences. They suggest that harvesting the vegetables that they grow could be a critical component in influencing their vegetable preference (O’Brien, & Shoemaker, 2006). The authors said that they designate 30 minutes for the garden activities which could contribute to their results. Thirty minutes is not enough time for anybody to engage in a pleasurable activity like gardening. These authors reported that the study took place after school, but it is not clear where it happened. The article written by Hermann, et al. (2006) is a quantitative one that also evaluated an after school program. This study took place in a garden in school grounds. The students were involved in a series of activities related to the garden. They participated in food preparation, food safety and physical activity education. The students that participated in this study were predominantly Native
American. The researchers employed a variety of curricula to conduct the activities in the garden. They report that there was a significant increase in the proportion of children reporting: “I eat vegetables every day” and “I am physically active every day” after the educational and gardening program. This article is one of the few that mention the importance of food preparation along with gardening activities. These activities seem to be appropriate to enhance students' experiences about food.

The last article that fits into the quantitative studies category is the one conducted by McAleese and Rankin, (2007). The purpose of this study was to investigate the effects of garden-based nutrition education on adolescents’ (6th grade) fruits and vegetable consumption using a control group. Students in the treatment group that participated in a 12 week nutrition education program were taught with a curriculum developed by Linenber and Zajicek (as cited in McAleese & Rankin, 2007, p. 663) “Nutrition in the garden”. Their results were that students increased their servings of fruits and vegetables compared to the control groups, which did not have the gardening experience. The authors suggest that their results help to show the importance of hands-on activities when attempting to change nutrition related behavior such as fruit and vegetable consumption.

The study written by Canaris, (1995) was the one without reference to a quantitative approach. The article is a narrative of the implementation of an integrated curriculum, which encourages hands-on, inquiry-based learning in a cooperative setting in Vermont, USA. The goal of her project was to improve nutrition and nutritional awareness for this group of students. She narrates through the article how the outcome of the study went beyond. She clearly illustrates how the school curriculum was included in
the gardening activities and vice versa. This paper tries to capture all those experiences that we as teachers and researchers experience when we are a part of a program that involves gardening with students. These types of experiences are the ones that quantitative approaches are not able to communicate.

2.4 Conclusion

It is clear that a novel approach is necessary in order to turn nutrition knowledge into healthier food choices (Seaman, et al., 1997). The need is not only about how we teach nutrition education, it also involves what the students know about these topics, where they learn about them, how they learn and which are the influences that shape their understandings, among other important issues. Watt and Sheiham, (1997) argue that compared to the extensive literature which has descriptively reported young people’s nutritional intakes, relatively few studies have assessed the social context and meaning of food in young people’s lives. This also needs to be addressed in the literature.

Through the review of the literature I noticed a disconnection-between the articles that address children’s knowledge and the ones that implement programs that involved gardening experiences. The methodological tendency is the use of quantitative tools to assess children’s intake of fruits and vegetables as well as preferences. This tendency is the result of the theoretical framework that the authors of the articles have, stated or not their research paradigm is closer to the positivistic and behaviorist approach. It appears that the use of the Social Theory of Cognition is widespread, in the area of nutrition education. Not all the authors that are part of this review situated themselves within this
approach, or, at least, they do not express the use of this theory, however the persistent use of indicators such as preferences and self efficacy to measure change in children’s behavior is congruent with this theory.

Based on this literature review it appears that garden-based nutrition education needs to happen with long term commitment and interventions. Programs that are only implemented for a few days or hours are not going to impact students’ knowledge and behavior.
Chapter 3: Methodology

3.1 Overview

Despite increasing numbers of studies that have made use of a qualitative approach to research in the field of nutrition education in informal settings, the prevalent methodological trend of conducting research in this area has been quantitative. This approach has not provided a deep understanding of the issues associated with the promotion of healthier food habits. Most importantly, there has only been a limited amount of research that has dealt specifically with the issue of nutrition education conducted in out-of-school settings and “Most studies with a focus on informal environments have been conducted in museum settings” (Briseno-Garzon, 2005, p. 47). Informal settings such as gardens and farms, where teaching and holistic learning take place, are very different from museums environments. Qualitative research which addresses questions such as those guiding this work is relevant to understanding the types of learning that take place in an informal environment like the UBC Farm.

This chapter describes the research process, the way it was undertaken, and the methodological aspects of the study. Also included are descriptions of the study’s context within the Intergenerational Landed Learning on the Farm Project (ILLP) as well as information about the school and classes that participated. The methodology and method that I chose through which to answer my research questions are also justified in this chapter. Finally, the ethical considerations and limitations of the study are discussed.
3.2 Research questions

This study investigated two research questions: 1) What are the grade 4-5 students’ perspectives and understandings of healthy food and nutrition?; 2) How does their school year participation in the Intergenerational Landed Learning Project on the UBC Farm influence their understanding about healthy food and nutrition?

3.3 Context

This study was undertaken within the context of a larger curriculum and research initiative, The Intergenerational Landed Learning on the Farm Project (ILLP) (http://cust.educ.ubc.ca/landedlearningproject/). The Landed Learning Project is an educational endeavor designed to re-imagine and re-construct the farm experience for community farming elders, local gardening enthusiasts, university students and middle school children. The aim of the project is to promote environmental stewardship and intergenerational learning. It brings together school children from British Columbia’s Lower Mainland, their teachers and volunteers who are known as “Farm Friends”. Together, volunteers and students learn to plan, grow, and harvest food on an urban farm: The University of British Columbia Farm (ILLP, 2005).

The ILLP’s activities take place at UBC Farm, a 24 hectare learning and research farm located on the southern margin of the University of British Columbia's Campus in Vancouver, Canada. The farm is student-driven and is integrated into the Vancouver community. One of the central roles of UBC Farm is to provide experientially based environmental education opportunities (“UBC Farm” n.d).
The ILLP is a project that offers participating students, teachers and volunteers the opportunity to be involved in the various stages of the growing cycle of plants. The experience takes place over a full school year, with the students visiting UBC Farm twelve times during this period. Each visit has a theme that relates to the visit activities, and is linked to the school curriculum (See Figure 1). In the fall, the students, teachers, Farm Friends, and the project team from the Faculty of Education at UBC prepare the plots for the growing season ahead. From January to June, they cultivate and care for plants. Throughout the program, teachers plan lessons that combine land and environmental topics with learning outcomes in all school subjects, while Farm Friends share their expertise and agricultural experiences with the children (Mayer-Smith, Peterat, Bartosh, 2009). An important component of the ILLP is that the Farm Friends are seniors from the Vancouver community and that the UBC students are mostly young adults. This unique blend of ages nourishes students’ experiences as well as the project as a whole.
In a study such as this one, which deals with learning in an informal setting like UBC Farm, important assumptions are made regarding the nature of learning and how and what we learn. Delving deeper into the theories of learning is not the main objective of this work; however, it is important for me to point out my understanding of how people learn, as well as to inform the reader about the paradigm in which this study is embedded.
Theoretical and methodological approaches to garden-based learning vary greatly across the educational landscape (Desmond, Grieshop, & Subramanian, 2007). At present, the most influential theoretical methodological approach in the educational arena is constructivism. This study was undertaken through the theoretical lens of this approach.

Constructivism is a theory about how we learn. Theoreticians with diverse epistemological and psychological approaches converge within this framework; important authors who have contributed to the construction of the field are, among others, Piaget (1896-1980), Ausubel (1918-2008) and Vygotsky (1896-1934).

An important and central argument in this approach is the interaction between the subject and object. The result of this interaction is the transformation of reality through the actions of the subject, who gives new meaning to reality. As such, the individual does not represent or copy the object, but adds new meaning to its schemes. Therefore, constructivism is an epistemological approach that deals with how, what, and when we learn. A key thesis in constructivism is that students actively construct their own knowledge in the social context in which they operate, and that they use prior knowledge (previous ideas /alternative conceptions) that are cognitive constructions, to make sense of reality.

The acquisition of knowledge is also influenced by culture, which provides symbolic tools as mediators between thought and reality construction. Culture thus provides the tools for interpreting reality. The constructivist approach sees subjects as developing within social and cultural environments such as family, community, school,
media, etc. As such, learning and knowledge are seen to take place between members of groups. The most relevant question then is not to ask what someone has learned, or what knowledge about the social and natural reality they have gathered, but rather how they acquired this knowledge.

An important aspect of the discussion concerns whether the person has acquired the knowledge themselves (Piaget), has done so through interacting with others (Ausubel) or if has been possible to acquire without another (Vygotsky). Vygotsky’s approach is known as a social constructivist approach. This framework involves several approaches to understanding learning as it acknowledges the existence of multiple definitions of learning. Falk and Dierking’s (2007) definition, which incorporates the social constructivist approach, is the definition used in this study:

Learning is the process of applying prior knowledge and experience to new experiences; this effort is normally played out within a physical context and is mediated in the actions of other individuals. In addition, learning always involves some element of emotion and feeling (p.216).

This definition emphasizes and honors the process of learning in the physical, social, and personal contexts of the learner (Anderson, Lucas & Ginns, 2003).

3.5 Methodological approach

I used a qualitative approach to answer my research questions. My aim was to increase the state of knowledge in the area of qualitative garden-based nutrition education. Since I was neither interested in identifying patterns or in constructing
generalizations about students’ ideas, such an approach was suitable for the purposes of this study.

The reasons justifying the employment of a qualitative approach include the nature of the research questions, a strong interest in learning about the students’ ideas regarding healthy food, as well as the opportunity to study individuals in their natural setting (Creswell, 1998).

It is important to explore students’ ideas regarding healthy food; their understanding and perspectives are a natural starting point from which to develop better approaches to nutrition education. Approaches that take the complex environments in which young students interact and learn about food issues into consideration will, down the road, play a prominent role in the promotion of healthier food habits and the prevention of medical conditions that stem from patterns of malnutrition.

Currently, within the educational arena, we are at a point in which a variety of perspectives and approaches merge within qualitative research. This makes it impossible to provide a precise definition of the term. Furthermore, it is not an objective of this work to explore the various methods of qualitative research. However, I consider it is important to point out that there are multiple definitions of qualitative research within educational research. I used Creswell’s (1998) definition, where qualitative research is and involves:

An inquiry process of understanding based on distinct methodological traditions of inquiry that explore social or human problems. The researcher builds a complex, holistic picture, analyzes words, reports detailed views of informants, and conducts the study in a natural setting (p.15)
Although the literature reveals some controversy regarding what constitutes qualitative research methodology, some commonly understood features of qualitative research methods include: researcher as a key instrument of data; natural setting (field focused) as source of data; data collected as words or pictures; outcome as a process rather than a product; inductive analysis of data; attention to particulars; focus on participants’ perspectives and their meaning (Creswell, 1998).

3.6 Method

"I interview because I am interested in other people’s stories" (Seidman, 1998, p. 1). This statement acknowledges the importance of the spoken word, the importance of being able to listen to another’s voice, and through this process, to understand another’s vision. The use of interviews in this study emphasizes Vygotsky’s idea that “every word that people use in telling their stories is a microcosm of their consciousness” (as cited in Seidman, 1998, p. 1) and that “the individuals’ consciousness gives access to the most complicated social and educational issues because social and educational issues are abstractions based on the concrete experience of people” (Seidman, 1998 p. 1).

This study used focus group interviews to gather data. This kind of interview provides insight into students’ knowledge. Children feel more comfortable speaking amongst their peers and they are willing to share more about themselves when they are in a group.

A focus group interview involves a qualitative research method (McKinley et al., 2005, p.543) that is particularly useful for exploring peoples’ knowledge and experiences,
and can be used to examine not only what people think, but also how they think and why they think the way they do (Kitzinger, 1995).

Moreover, “the intent of focus group interviews is to report the views of participants, not to generalize to larger groups” (Vaughn, Schumm, & Sinagub, 1996, p. 154). This method involves active participation from the subjects, which is consistent with the increasingly recognized need to encourage the active role of children in research (as cited in Ross, 1995). Another important characteristic of focus groups is that they allow participants to reflect on questions and responses.

Focus group interviews involve a multidirectional rather than a unidirectional conversation between the interviewer and interviewees. It should be noted that some modifications must be made to the interview process when non-adult populations such as children and adolescents are participants (Vaughn, et al., 1996). Vaughn et al. (1996) suggest that focus group interviews should not be conducted with children less than six years old. They further add that the size of focus groups conducted with children need to be smaller than ones conducted with adults. They suggest five or six participants as being a suitable number for focus group interviews conducted with children. I decided that four students was the most appropriate number for this study due to the high percentage of students with English as a Second Language (ESL) among the group, and also due to my own limitations.4 The length of interviews is another issue that must be taken into account, with the literature suggesting 45 minutes as being appropriate for children under 10 years old. In this study, the length of each interview was limited to 25 minutes. This

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4 The researcher’s first language is Spanish.
was the result of two factors: first, the length of the interviews had to fit with the teacher’s schedule; and second, the attention span of some students was limited to about 20 minutes. Gender and group age are reported in the literature (Mauthner, 1997; Vaughn et al, 1996) as important factors to take into consideration when conducting these types of interviews. These studies also reported that single sex groups were likely to be more successful than mixed sex groups.

3.7 Research design

In order to acquire a deeper understanding of the students’ ideas and beliefs about healthy food, I conducted focus group interviews at Sausalito Elementary School in east Vancouver; one of the schools that had participated in the Intergenerational Landed Learning Project (ILLP) at the UBC Farm, a one year garden-based learning experience. The class that participated in the one-year ILLP experience was composed of 29 students, however, the total number of students that participated in the interviews were 23. All interviews were semi-structured. The class teacher organized the composition of the groups for the interviews to fit into the school schedule. There were seven groups in total: five of these groups had three students each, and the other two had four. The teachers also decided on the groupings for the comparison group. In this class, I had three groups, which each of them composed of four students. The ratio of girls and boys was not one of the study parameters. I conducted all interviews at the students’ school. Some were done at lunchtime, while others were conducted during recess and class time. The interviews were held in a variety of different spaces: a classroom, an annex to the main
classroom and also in the teachers' lounge. The duration of the interviews was approximately 25 minutes. Each of the groups’ conversations was audio recorded.

In order to answer the research questions, the interview questions (see Appendix A) were compiled from two different studies (Hart, et al., 2002; Ross, 1995). The interviews with each group started with a reminder to the participants that these were not tests and that there were no right or wrong answers. The first questions, which had to do with what the students were eating at the moment, were aimed at 'breaking the ice' and putting the participants at ease. The questions were not covered in the same order in each interview.

The data gathered from the interviews was transcribed and analyzed at a later date by the researcher.

### 3.7.1 Study participants

One group of students in this study participated in the ILLP during the 2006-2007 school year came from Sausalito Elementary School, a public elementary school in East Vancouver, British Columbia. This group was a mixed class of 29 students in grades 4 and 5 (12 girls and 17 boys). The other class that participated in this study was also from pseudonym Elementary School, but the students in this class did not participate in the ILLP experience and functioned as a comparison group. The composition of this class was uncertain until the day of the interviews. I had originally contacted the teacher for

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5 In this chapter I am using the term researcher to refer to myself.
this class, explained the study to her, and she agreed to participate in the project. I gave her the consent forms and she distributed them to the students so that they could take them home and have them signed by their parents. Unfortunately, as only a few consent forms were returned, I did not get consent for enough student participation from the students in this class. I then spoke with another teacher from the same school that also had grade 4-5 students, and she agreed to distribute the consent forms among her students. Between these two classes, I was able to make up a comparison group that was composed of twelve students.

Like any school, Sausalito Elementary School has, its own particularities, some of which were relevant to this study. For example, Sausalito Elementary School has both high English as a Second Language (ESL) and special needs population, and the students’ cultural and socio-economical backgrounds are quite heterogeneous. However, the student population at this school stems from a predominantly south Asian background, and the classes that participated in this study were not an exception.

3.7.2 Pilot interview

I conducted a pilot of the interview protocol at UBC Farm during one of the visits of the class from Sausalito Elementary School that was participating in the ILLP. I had originally planned to conduct the interviews at UBC Farm during the students’ visits; however, I reconsidered this after implementing a pilot interview. This pilot consisted in one focus group interview with one of the groups in the ILLP class. Space considerations were a primary reason for this change of plans. It was revealed that closed spaces, which were available at the school, were more appropriate for conducting interviews than the
open spaces at UBC Farm. The pilot interviews also helped me determine the appropriate size of focus group. My initial efforts revealed that students tend to get distracted by each other when interviewed in larger groups, and also that listening to more than four students speaking at the same time would be challenging for me. The initial pilot interview which was conducted at the UBC Farm also indicated that noise level proved itself to be a hindrance. There were too many distractions at the Farm. As a result, I decided that the school would be a more convenient place from which to conduct the interviews.

3.8 Data analysis

Focus group interviews are used in many ways and there are several methods used to analyze and report the findings from these types of interviews (Vaughn, Schumm, & Sinagub, 1996).

All focus group sessions were audio-recorded and transcribed. I analyze the data using the long-table approach (Krueger & Casey, 2000). This method breaks down the process into manageable chunks which allow the researcher to identify emergent themes and categorize the results.

The long-table approach involves reading the transcripts and forming a matrix with the questions and responses for each focus group interview. I did this for both classes involved in this study. Students’ answers were written down in this matrix. This visual diagramming provided me with an overall picture of the responses. It also served the purpose of identifying both major and minor emergent themes that arose from the
responses. I determined which themes bridged across questions and which themes were recurrent. This system was used to gradually make sense of the data.

I coded the quotes that I considered illustrative of the themes. Not all quotes necessarily fit into the emergent themes. As Krueger and Casey, (2000) point out, “in focus groups, people regularly get off topic or expand in detail on an aspect of minimal importance to the study” (p. 135). I also identified “unusual/ strange/ different” responses. Although I did not follow the exact steps that the long-table approach suggests, the visual component was generative, and it allowed me to work with manageable information.

3.9 Ethical considerations

This study is embedded in a larger project of environmental education through intergenerational community learning. In order to be able to conduct my study, Unpacking Your Lunch, I requested an amendment to the “mother project”. This process was undertaken through the Behavioral Research Ethics Board at UBC (see Appendix C).

Consent forms, which were to be signed by both students and their parents, were distributed to the students who participated in this study (see Appendix B). If either students or their parents failed to sign or return the forms, the child in question was not included in this study.

Throughout the interview process, the students were allowed to ask the researcher questions. At the beginning of the interviews, I explained who I was and what I was doing and I also briefly explained the interview topics and procedures to the students (see Appendix A).
The identities of the students and the school were kept confidential. Anonymity was maintained by the use of pseudonyms in all written work related to this research study and the dissertation.
Chapter 4: Findings and Discussion

4.1 Introduction

This chapter discusses the results that were obtained from the analysis of the interviews. A total of five recurrent themes were found across all the interviews: a) Children's understanding about healthy food (how they define healthy food); b) Factors that influence children's views of food; c) The social context of food; d) The lack of connection between knowledge and food habits; and e) Children’s understanding about the Canadian Food Guide. The five themes, which emerged from the data are presented and discussed individually in this chapter. I close the chapter with a discussion of the results.

My research questions were: What are the grade 4-5 students’ perspectives and understanding regarding healthy food and nutrition? And how did their participation in the Intergenerational Landed Learning Project (ILLP) at the UBC Farm during the school year influence students’ understanding about healthy food and nutrition? The first question was answered satisfactorily through the focus groups, but the second question was difficult to address. Interesting data was obtained regarding the impact that the experience at UBC Farm had on the students, but this data was not related to food issues. Although the connection between the students’ ideas about food and their experiences in the ILLP was evident through analysis of the interview data, the students themselves did not consciously make any such connections.
4.2 Children's views about food

Children in both groups had similar perspectives about food and healthy eating. In order to begin the conversation with each of the student groups, the first question that I asked them was what they had had for lunch that day. This question served as an entry point to gaining a deeper understanding of what their favorite food was, whether or not they considered it healthy, and why this was so. Throughout all ten groups (seven from the class that participated in the ILLP and three from the comparison group), the tendency towards a favorite food was clear: it was pizza. This trend is consistent with other studies (Contento, 1981; Ross, 1995) that have reported that pizza and chips were the most frequently mentioned favorite foods among the study participants. Pizza is a noteworthy food because its widespread availability and its popularity allowed me to use it as a spring board from which to engage the students in interesting conversations regarding whether or not it is a healthy food. Pizza was seen by the students as unhealthy in most cases, and they expressed these beliefs in some of the following ways: “Pizza is not healthy because there is a lot of cheese on it,” and “Pizza is not healthy...tops are greasy.” Some students believed pizza to be healthy and supported their argument by saying that “Pizza is healthy because it has vegetables and olives,” and also “pizza is healthy because it has cheese that is halfway healthy.”

Other favorites foods included a variety of food from McDonald’s, Subway, Kentucky Fried Chicken, Church’s Chicken and something called Pizza Pops (which are a calzone-type snack that are sold pre-cooked and frozen). Regional ethnic foods like roti bread (an important food in India and Pakistan), pupusas (a type of thick tortilla from...
Central America that is stuffed with cheese, beans or meat) and Chinese food were also mentioned by the students as being among their favorite foods.

Students’ responses ranged from very general to very specific. An interesting answer was given by S (a student in the ILLP class) when I asked him about his favorite food. He answered, “Oh! Juicy chicken wings with Coke and Church’s Chicken.” It was interesting that S used the adjective of ‘juicy’ to describe this type of food. When asked whether he thought this food was healthy, he answered that “I do not think is healthy all the time, but I always keep in shape... I always run with him, and so, if we like keep on running and running until the teacher says you have to stop”.

This answer is very interesting because although S knows that his choices regarding food are not healthy, he seems to have a clear conception of the factors that lead to health. Furthermore, his definition of what is healthy involves not only food, but includes also being in shape and being able to perform certain physical activities.

Children’s understandings regarding the meaning of health involved descriptions related to physical activities and manifestations: exercise, being fit, being strong, and they also mentioned the importance of consuming certain types of foods: i.e. “eat a lot of vegetables.” Concepts such as vitamins and calories were also associated with being healthy. On several occasions, some of the students also associated healthiness with the lack of consuming greasy foods, mentioning that they believed that oil, cholesterol and fat were bad.

An important trend that emerged from the data was that the students consistently used terms like ‘fat’, ‘cholesterol’, ‘fatty foods’, and ‘oil’ as interchangeable terms
without any true knowledge about their meaning. When I asked them about which foods they thought were unhealthy, students consistently mentioned these terms. One of the groups which consisted only of girls (from ILLP class) engaged in an interesting discussion regarding whether they considered olive oil to be good or bad. After thinking about the question, one of the girls came to the conclusion that olive oil was healthy because olives are healthy, and so olive oil must therefore be healthy too. Although the reasoning may sound simple, I believe that it illustrates an understanding about food and how children construct their knowledge about it. Another example involves another student who said that, "I thought chocolate was supposed to be healthy because it's made from milk."

I chose to include a question asking the students which foods they thought were good, and which they thought were bad because I came to realize that the concept of what is 'healthy' was vague for them. 'Good' and 'bad' foods were broader terms and they were less complex than the term 'healthy'. The answers in all 10 of the groups were similar - bad foods were those that could be purchased from McDonald's. This answer was consistently recurrent in the group that had been involved in the UBC Farm I LLP project because they had watched the movie Super Size Me in class. The students in this group were aware of the type of food that McDonald's serves and the repercussions that eating at this fast food chain could have on their bodies. Other foods that were classified by the students as bad foods included cake, pop, food from Wendy's, fatty foods, fries, fried foods, chocolate, candy, ice cream, sugar and gum (this was mentioned because in some groups I tried to add some context by asking the students about foods that were
good or bad for their teeth). Regarding sugar, one of the students suggested that “Mostly
everything that is sweet is not healthy”. (H, ILLP student, 2007)

The consumption of pop among students was found to be a popular trend. In one
of the focus groups from the ILLP, a student shared that he drinks Coke almost every
day:

Student 1: Coke’s bad for your teeth.

Researcher: Why?

Student 1: Because it has lots of sugar. I think it has lots of sugar and acids and
stuff that can [burn] teeth.

Researcher: Like, acids?

Student 1: Yeah.

Student 2: Uh oh. I drink that every day.

Researcher: Okay, yeah. You drink it every day?

Student 2: No. I drink it almost every day.

Researcher: Almost every day?

Student 1: He's a soccer player.

Student 2: Lots of energy.

Student 2: We usually have Coke bottles when we play soccer.

One of the students in the same focus group made some very interesting
statements that showed what? When I asked the group about bad and good foods, M’s
answers were pretty consistent:
Bad foods are cake; all that junk stuff that you eat for dessert...it is amazing how much people in this school eat junk food. This morning, Mr. B (the teacher) talked about this for the first time. He goes, “so try not to eat chips as much as you can, and all of that stuff.” And the moment he says that, it is recess time. So, he goes “get out for recess.” About 10 people pull out a bag of chips. People pull out chocolate bars, that kind of thing. (M, ILLP, 2007)

This quote shows us that the student was aware of the behavior of other students and also he was critical about it. It is difficult to arrive to conclusions about his nutritional awareness, however being critical and analytical help him to make connections about what he knows.

4.2.1 Ideas about healthy food

Begin with an opening statement that encompasses what will follow. Results need to provide the message you want to the reader to take away. Then you can go on to illustrate this message with the data. Regarding her understanding about healthy food, one of the students, A (ILLP student, 2007) said that “when you eat it may not like it and if you keep on eating may get used to it.” Her answer is not dissimilar to another student’s answer, “Healthy food tastes bad.” This kind of attitude towards what is known as healthy food is consistent with other authors’ findings (Ross, 1995).

Furthermore, as one can see in the quote, “Home cooked food it is more healthy than the restaurants’ [food],” healthy food was also linked to home cooked food (H, ILLP 2007).

The most common answers among students regarding what they considered to be good foods included vegetables and fruits, protein, dairy, juice (because, they said, it
comes from fruits), green tea, green vegetables and meat. However, meat was not mentioned many times and this may be related to the fact that a significant percentage of the students that participated in the study came from families where vegetarian traditions were part of the culture. One of the students, B’s reflections about meat was very interesting:

Meat is pretty healthy...it depends what meat. If you are talking about McDonald’s (meat), very unhealthy. If you are talking about, like, the other, like, the home meats or something like that, like the goats and all that, those are healthy. But not the McDonald’s or KFC. And if you have healthy meat, like, everyday, then it gets not - it is not healthy. (B, ILLP student 2007)

This student had a significant knowledge about healthy eating and he was able to think through issues related to what is healthy and what is not. In effect, his view on health and healthy food habits was one about moderation.

4.2.2 Least favorite food

The least favorite foods mentioned by the children in both classes, ILLP and comparison were fruits, vegetables, and food made at home (i.e. soup). The students also named specific foods such as mustard, mushrooms, and oats, but food items such as these were only mentioned sporadically. A correlation was found between their stated favorite foods not being healthy and their least favorite foods being healthy. That was not surprising. There were no noteworthy differences between the two classes that participated in this study.
4.3 The factors that influence children’s views regarding food

Consistent with other studies (Hart, Bishop, & Truby, 2002; Stewart, Gill, Treasure, & Chadwick, 2006), I found that marketing and advertisement have an enormous impact on students’ discourses and perceptions of food and health. Food from Subway was frequently mentioned by the students as being healthy, and their opinions about why this was so could be linked to the musical jingle from the Subway advertisement which tells its audience to *Think fresh, eat fresh*. Students believe that the food served at Subway is healthier than the food sold in other fast food chains. To argue their point about Subway having healthy food, one child from one of the class suggested that “Subway is pretty much healthy [as it] only has 8% fat.” Another reason that the students mentioned regarding why they thought Subway food was healthy was related to the way Subway displayed the food they used to prepare their products. One student commented on the chain’s food handling strategy, “Some stores, they have-like, their food, they have it just sitting there for a while, but Subway, they - Subway, they clean their food and-with no chemicals.”

I asked this student how he knew about this particular food handling practice, and he told me that his father had told him. During this conversation, he showed some confusion about the meaning of ‘organic.’ In the course of my focus group interviews, I did not ask the students about their understanding of the meaning of “organic food.” However in this particular group, the student mentioned that he believed that organic meant ‘fresh’, and that since he thought that Subway’s food was fresh, it was therefore organic.
4.4 The social context of food

Food plays an important role in both our survival and our social practices - it is a human necessity, a human right, and the center of many of our social and cultural practices. The food that we choose to eat and the ways in which we eat it tells a lot about our culture. Food is much more than the nutrients it provides, we do not eat nutrients, we eat food. When we think about the foods we like and dislike, we are most often not thinking in terms of nutrients but of flavor, smell, appearance, and the feelings that we have when we are involved in the activity of eating. Children use these same attributes when they consider what foods they like and dislike.

During the interviews, the students spoke about their personal and familial practices, and about religious dietary restrictions. During my participation in the ILLP I have been exposed to different religions, which have particular dietary restrictions. For the students in this study who participated in the ILLP the cooking activities began in the middle of the scholastic year, and it was with this class that I "piloted" the cooking activities during students' visits at the ILLP. An important element was to know about students' allergies, some students said to me that they were allergic to specific foods. But later during the project year they explained to me that they were not allergic, and that the reason they avoided certain foods was a dietary restriction related with their religion. This disclosure came after several months of sharing ideas about food and working with the students in the kitchen at the Farm. I learn form that and also reaffirmed me that for the students it is important, in order to share more about themselves, to be engage with the place and the people.
Language was another important factor that was relevant to this study. One student expressed that he did not know the name in English for some of the foods that he ate at home. Another similar example was a girl (H), who said, "I do not know the names in English (referring to the food that she usually has at home)." In response, I asked her, "Do you know the names in Persian?" She told me the relevant names in Persian, but I did not understand what kind of food she was referring to. I now know that she was referring to a dish that was made with lamb. This is an example of the role that culture plays in our likes and dislikes regarding food, also a manifestation of her culture, because she was telling me about what she likes to eat and that is the food that represents her home country. She is from Iran. This experience is an example of language barrier between the researcher and children from different ethnic backgrounds.

4.5 Disconnection between knowledge and food habits

The interviews demonstrated that children are able to mediate and manage contrasts and contradictions about food effortlessly (Stewart, Gill, Treasure & Chadwick, 2006). This finding confirms what previous studies (Ross, 1995; Seaman 1997; Stewart, et al., 2006) have been pointed out; that while students’ understandings about food and healthy eating are not poor, they are often applied inconsistently and selectively.

Students have information about what is healthy eating and what is not, but this information has not been translated in their everyday life into actions. One clear example of this situation involved a student I will call D. As D was in the ILLP class, I interacted with his group every time they visited the UBC Farm. D’s interview show that he was
clearly knowledgeable about food and healthy food practices but his actions were clearly contradicting his evident knowledge.

During the school year I had the opportunity to observe the food that D ate for lunch on the days he came to the UBC Farm and I was also able to glean more information about D through discussions with his teacher. According to his teacher, D was having a difficult time at school. His arrived have seldom eaten a proper breakfast at home; this appeared to influence his energy level during Physical Education class. During the interviews, D mentioned, among other things that "I do not like sports". The food that D brought from home to eat during lunch time was not healthy. Although I cannot draw any conclusions without further information about his specific case, it was clear that although this boy was well informed about nutrition in general, he was not in charge of his food choices. Furthermore, I came to realize that this boy's life situation was not an easy one for a multitude of reasons, and that the factors influencing his eating behaviors were complex. For this reason, it became clear that it was not realistic to believe that his eating habits could simply be altered as a result of changing his behaviors regarding food choices.

This example was not unique but it caught my attention, because it encompassed a lot of factors that I think are important ones to consider as we examine what influences students' understanding about food and the disconnect between that understanding and their food choices.

In one of the groups from the comparison class I acknowledged a student telling him, that he had a good knowledge about food and then I asked him do you think you
apply all that knowledge when you are eating. His answer was: “No”, then I asked, 
“Why?” and he said to me: “Because I guess when we start to eat we think, oh this is 
good, and we forget about it so we start eating it”. Another example that information is 
not enough and that when we talk about food there is much more involved that only 
knowledge about what is good and what is bad.

4.6 Children’s understanding about the Canadian Food Guide

Students had interesting ideas about food groups and the Canadian Food Guide. 
This insight emerged from a question concerning food groups. Specifically I asked the 
students if they know about which foods can be grouped together. This question showed 
me that the students had diverse understandings about foods groups.

All students had studied Canada’s food guide (see Figure 2), and they were able 
to identify the four food groups in the Guide (vegetables and fruits, grain products, milk 
and alternatives, meat and alternatives), however many students were confused about the 
classification of foods in these specific groups.
For example one of the students in the comparison group identified junk food as one of the food groups. A prevalent confusion among the students was that they mentioned milk products and dairy products as different groups. Another idea shared by students was that there are some meat products that are bad and those are not included in the group meat and alternatives.
In both classes the students mentioned that they recalled doing an activity with the food guide, an example of this is the following extract from one of the interviews:

A: We learned about this in the— that food thing. Yeah, we had to take it home and [indiscernible]

Az: Yeah, we heard it before.

A: What was it called again?

P: The food groups.

A: Oh yeah, the five food groups.

Researcher: Yeah, exactly. So do you remember something about it?

P: Yeah, well there are all these food groups, and then we had to list, like, everything we ate and which food group that it goes in.

Al: And we had to have at least two servings of each one, or something.

Az: Yeah.

Researcher: Okay. And did you practice? Like—

Az: What do you mean “practice”?

Researcher: Like, you learned that in your classroom?

A: Yeah. First we learned it, [and] then we took the sheet home.

Researcher: Okay, okay. And do you still do it?

P: No. We only did it twice.

Al: It was only, like, one little unit.
Researcher: Okay.

P: Yeah. We did for two weeks, [and] then we stopped.

Researcher: Okay. And there is something that you remember and then do you eat that from?

Az: No, when you get home— suppose you eat yogurt. Then you record it, like, you write "yogurt" underneath whichever food group it goes in. Like, the food groups, then you write it underneath it.

The activity and lessons with food groups that students had done in their classrooms and continued in their homes did not appear to help students understand the Canada Food Guide or food groups. Many students found it difficult to recall the topic or the activity. For students in the ILLP I tried to remind them about food groups by making some reference to cooking and growing activities, but in many cases my questions and references to their Farm participation caused more confusion for the students.

In another group the answer from one of the students showed me that they may recall the name for the four groups, but not understand the significance of the grouping. When I asked these students "do you know what the food groups are? And, why do we put together those types of food?" The answer I heard was: "energy and health?" I asked another student from the group and she said something about "food triangles" referring to "all the food that you eat". I inferred from her answer that she was referring to the food pyramid prevalent in the US discussions of food groups. Other studies (Hart, Bishop, &Truby, 2002; Smith, & James, 1980) have produced similar findings to the ones reported in this study, namely that students have little knowledge about the food groups
and they do not know why the foods groups are categorized in that way. In general students are able to name the groups; however it is challenging for them to classify foods in those abstract groups.

4.7 Children’s understandings about farms

Under this theme I consider students responses regarding four questions I asked students during the focus group interview: Which foods come from a farm? What is the importance of farms? Why are plants important? And, what do plants need to grow? With these questions I hoped to gain insights that would help me answer my second research question: How did student participation in the Intergenerational Landed Learning Project (ILLP) at the UBC Farm during the school year influence their understanding about healthy food and nutrition?

The results of this study are consistent with Mayer-Smith, Peterat, and Bartosh, (2009), who reported that the students that participated in the ILLP experience at the UBC farm think about the farm as a special place where they could learn and play at the same time. Students that participated in the ILLP gained a broad perspective about the farm as a learning space that reflected their hands-on experiences. Some examples that are representative of this are shown in their responses to the question about the importance of farms: “learning to get along with nature” “To learn what is healthy and what is not and how to farm so you could plant plants and when you plant them”, “To learn what is to farm”, “about vegetables and about the environment”, “You learn how to grow flowers and vegetables”, “To make people happy”, “Grow stuff to make people
healthier”, “You learn outside”, “you learned about what you should eat and what you shouldn’t, I learned a lot”, “Grow vegetables and fruits”. In the comparison group I asked students if they have been to a farm. Some of them had experiences on farms outside Canada, while others had never been on a farm. An interesting response was given by one of the students when I asked him about being on a farm and he said no. When I then asked him to imagine a farm he said: “Like a lots of grass, ...growing carrots, animals, cows, chicken, goats, yeah, pets, some pets, yeah”. This response shows his thinking about a different type of farm - and illustrates how broadly this term has been used. There are some places that are called farms that are spaces where you can go to pet domesticated animals, and it is likely this is the type of place this student was imagining.

The students that did not participate in the ILLP mentioned farms as being predominantly focused on raising or keeping animals. In comparison, the class that attended the ILLP viewed farms as a place for growing vegetables, and fruits. They identified common vegetables as well as new ones for them like kale. Kale, while a particularly nutritious vegetable, is not part of the diet of most urban students. But kale became a familiar food as it was a common vegetable in the ILLP students’ gardens at the UBC Farm.

An important difference between the two groups of students in this study was evident when I asked them about the importance of plants. The students that participated in the ILLP had answers with an emotional content like “They look nice... and smell good”, “they grow stuff and makes the planet beautiful”, “Give us food and makes us
happy”, “pretty we enjoy them” these students thought about the importance of plants in an aesthetic way. Others offered answers that were related to the importance of plants as providing the basic elements for life: “They started everything. Well, their leaves-tress is a type of plant. They made all these books. They are all made of paper. And trees give you paper. And then wood. This bowl is made of wood. The whole school is, basically, made of wood. So, plants and trees give you everything-your fruits”. Another student said “[Plants] help us eat because they give us the food that we need to eat. And they help us breath because we help them breathing out carbon dioxide. They breathe it in, and they breathe out”. Another student mentioned that “if we did not have plants there would be no humans”. There was a mention by one of the students about organic food: “Plants make plants and some plants are organic then you can eat them”. There were also a few students’ answers that linked the importance of plants with health issues. For example, one of the students said that the importance of plants is “That we can have vegetables and be healthy”.

In the comparison group, the students’ answers were related to concepts of CO₂ and O₂, which may have reflected that at that moment they were learning about photosynthesis. Their answers were linked also with the vital necessity of plants. Some examples are: “Breaths in CO₂, what we breathe out... Gives us O₂”, “Give us food and O₂ [plants] use CO₂, “Plants are pretty cool. And, like the one- I do not know what is called- that sometimes eats flies”, “I think [plants] is good because, like it helps make air and it’s, like, we breathe in CO₂”, “we depend on sun which gives energy to plants. Without plants we would not be alive”.
The final question I asked was regarding what do plants need to grow? The answers regarding this were similar among all the students, sun, water, air, oxygen, food, however the students that participated in the ILLP expressed certain ideas related with their experience, they mentioned that plants need to grow “perfect spacing”, “they need spacing and how [inaudible] the seeds are supposed to be planted”, “if it doesn’t have sun, it either grows but it tastes really bad, It doesn’t taste like it is supposed to. If it doesn’t have water, it just dies. And if it doesn’t have proper spacing, it grows way smaller than it’s supposed to”, “They need air that what the worms do. They—because the ground is all packed together. Well, the worms go through it and make it loose so it can breathe. I think that’s how it goes”, “water but not too much water”, “Worms!” Clearly the experience at the farm had an impact in students’ knowledge about what a plant needs to grow. Their answers went beyond the “typical” information that students learn in the classrooms.

### 4.8 Discussion

This study needs to be considered in light of its limitations. The research was conducted with a small convenient sample. Due to the qualitative nature of this study the findings cannot be assumed to be representative of this age group; however it was interesting for me to recognize in the students’ answers important similarities with the ones reported in the literature.

Through this study I realized that a range of factors influenced food choices and preferences in children and the relationship between these factors is often quite complex
(Stewart, Gill, Treasure & Chadwick, 2006). This study aimed to provide insight into the understanding of healthy food and nutrition that children have. During the inception of this study, I was aware that the food issue would bring to the table important ideas regarding children’s understandings about food and nutrition. The result was overwhelming, the issues related with food and nutrition went beyond my expectations. The students’ realities were among the factors that were most evident. I learned how students’ social environments play an important role in their relation with food. Their parents may work all day, so in some cases students take care of themselves and this affects their food habits and consumption. Family members are very busy, and this also has an impact in what students have for lunch. Hart et al. (2002) in their study mention something that I consider important about the role that social status plays in students’ understandings and nutritional awareness. A high family income or higher educational level appears to be an indicator of greater nutrition awareness, although few studies link social status and knowledge directly, preferring to focus on behavioral aspects such as actual intake of fruits and vegetables where social economic differences are seen (as cited in Gibson et al., 1998; Johansson, et al., 1999). I could not agree more with these authors, in my experience working with three different schools that have different socio economic status the differences in students’ knowledge about food issues and eating habits are important ones.

Stemming from the analysis of the data was evidence for the relationship that these students have with fast food. The students expressed in the interviews that they know that junk food is bad for their health; also they were aware that food from
McDonald’s, KFC, etc., is “junk food”. The interesting connection that they made between food from Subway and good health was related to the advertising that this fast food franchise promotes. This is an excellent illustration of how companies can manipulate the consumer. The influence that media and advertising has on children is overwhelming. While we are trying to teach students about nutrients, and food pyramids that are confusing students, the food industry has nearly perfected their job. On glimmer of hope is that advertising could be used in a positive way to improve health; promotion is needed in order to prevent bad eating habits.

It is very interesting how junk food has become both a treat and a reward. What is the message that we are sending to our children by doing this? By rewarding children with food (unhealthy ones in particular) we are contributing to current health problems. In a chapter of a book that I read a year ago, one of the authors wrote something that came to my mind this study; she mentioned that she spotted a bumper sticker that said: “If you are what you eat, I’m fast, cheap, and easy” (Waters, 1995). That phrase made me think a lot about it, and yes she is right, fast food teaches that food is cheap, fast and easy. Do we really want our children thinking like that about food? This has many consequences that go beyond the focus of this work, but it is really important to re-think what we are teaching with our everyday actions. A gardening experience that teaches students about the intrinsic value that food has: it is not fast, it takes a while to grow edible plants, and it requires care and effort.

The issues that arose in the interviews are important ones that give us an insight into the complex world of food. Returning to my research questions, which ignited this
study, I will respond to what I learned through this experience that can help answer these and that would generate more questions. My first question was: What are the grade 4-5 students’ perspectives and understanding regarding healthy food and nutrition? Students in this study were aware of nutritional knowledge, they know what is healthy and what is not, they know that their favorite foods are not healthy; they know that vegetables and fruits are healthy and also that being healthy is related with physical activity. What they told me is that they do not like healthy foods and that when they have the opportunity to choose they choose fast food (in general) because they enjoy this type of food. Results of this study suggest that the children involved in the conversations choose food primarily for reasons of personal preference. That was reported in other studies (Ross, 1995; Noble, et al., 2000). Healthiness is not an important factor in children’s choices of favorite foods. For their favorite foods, children chose foods that they like to eat, regardless if they are healthy or not. And that is totally natural, we all like foods that taste good. If someone asks me what is my favorite food, I would choose probably something that is the healthiest”, but that does not mean that I have that food every day. The difference with children is that they are consuming in excess their favorite foods. The reasons for this are many and some of them out of their control; however, with the latest trends regarding food, there is avoidance instead of equilibrium, Children are creating unhealthy relationships with food, that in the near future will have negative outcomes. Now more than ever we are exposed to food, everywhere, books, TV shows, advertisement. Food products that are advertised as a healthy options, because they are light or have half of the calories, are unhealthy because of all the synthetic ingredients that they put into these to
make them healthy. These messages are reaching children, and the ones that participated in this are not the exemption. There is the notion that oil and fat is bad, they do not know what they are, but they classified oil as bad for being “fatty”. Again what students are hearing everywhere is: fat is bad, do not eat food with fat, oil makes you fat, etc., responses like the ones expressed for the students regarding fat and oil are the ones expected in an environment that invests its efforts in condemning oils.

Ross (1995) points out in her study that different life stages require different health educational messages and this is supported by this study. Children had a different value and classification system from that of adults. We have been teaching in schools food through food groups and food pyramids; however, these abstract concepts are not reaching students. In my opinion this is a consequence of trying to teach children adult tasks. There is little point sending the same health education messages to children as to adults (Satter, 1999). Students in this study had a difficult time when I asked them about the foods groups. They made some references to the Canada food guide, mentioning the groups, some of the students did not know which foods belong to which groups, and they do not use this guides to make decisions regarding their food. According to Satter (1999) teaching the Food Guide Pyramid to children is not worthwhile. She reflects on her experience of teaching this to adults and says that it was difficult to keep it from getting negative and medical for adults. The use of such instrument requires thinking abstractly and children in this study were ready for this. This in my opinion requires a different approach. Materials need to be cognitively appropriate, we should not be teaching adult's
task to children. It is important to understand children’s beliefs and practices within their own meaning system in order to maximize the healthy eating practices of children.

My second research question was how did their participation in the Intergenerational Landed Learning Project (ILLP) at the UBC Farm during the school year influence their understanding about healthy food and nutrition? Students connected their experience at the farm with their knowledge about plants. Meaningful experiences at the UBC Farm were created through exposition and experiential learning; memories may be created that are going to be an important part their knowledge regarding plants, people, and food among others for a long period of time. However, I was expecting that students’ answers would show that they have made a connection between the food that they grow and their knowledge about food and nutrition. This did not happen; exposition and experience are essential but are not enough. We need to create appropriate discussions and activities that would bring to the table all the issues that concern students regarding food.
Chapter 5: Conclusions and Further Research

5.1 Conclusions

This chapter provides conclusions drawn from conducting this study, discusses implications and limitations, and gives recommendations for future research. Improving the nutritional status of school-age children provides an effective investment into future generations. Food habits developed during infancy can influence preferences and practices in later life. Moreover, investing in better food habits will translate into healthier consumption patterns. It is not difficult to see that current nutrition education is an ineffective. Through the media, we often hear that upcoming generations may be the first to experience a shorter lifespan than their parents because of their poor eating habits. This is a widespread contemporary problem and the solutions, in my opinion, need to stem from a variety of different fronts: the school, the family, the media and the community.

The studies that I reviewed clearly state the need for an innovative approach to nutrition education. The implementation of a program such as the Intergenerational Landed Learning Project, where gardening and farming are employed as a tools to engage students in food conversations which will encourage them to have a better understanding of food and nutrition is an innovative one; however, research conducted in out-of-schools settings like UBC Farm is sparse and mostly done within a quantitative framework. Social cognitive theory, as a framework for nutrition education studies is prevalent in the
literature that is mostly centered on changing behaviors, consumption and patterns related to eating more fruits and vegetables.

The studies conducted using quantitative frameworks measure means, percentages and correlations etc., but very few ask students regarding children’s opinions and preferences. We need to pay attention to children’s voices in order to understand what is happening in their world. This study contributes to qualitative research in the area of garden-based nutrition education.

The use of an out-of-school setting presents a series of advantages and disadvantages. Thus, I consider important to evaluate a project like the Intergenerational Landed Learning Project at the UBC Farm in order to create awareness of the importance of a project like this. It is a complicated endeavor for schools to take care of school gardens. Resources are probably the most important one, whether people are willing to take care of the garden during vacations is an important impediment. Projects like the ILLP are also a research nursery and “training” spaces for teachers who are willing to implement a school garden. The ILLP also is committed to its community, not only with the university, but also to Vancouver’s seniors, providing them a space to learn about young students and to share their amazing knowledge.

The experience at ILLP triggers important learning experiences in a multisensory way. Learning is not confined to one subject or to a specific moment. Learning is happening all around, and students are saying that they learn, so we as researchers need to be able to put forward the issues that we consider structural in order to create meaningful connections that will allow the students to have a better life.
The use of gardens and farms with educational objectives is a difficult endeavor, but one that is worth it. Financial and social pressures surround projects like the one described here, but it is important to have these spaces. The UBC Farm allows us to teach students that in other way would not be able to have such experiences. We need to encourage the use of these types of spaces, creating more research that speaks in behalf of our work and that allows us to share what we have been learning.

An important point that the authors of previous studies do not mention in their publications is that students are individuals who live in particular families and communities, and that these families and communities sometimes have very different cultural values from the standards espoused by the school system. For example, it is widely known that it is important to eat “five servings” of fruits and vegetables per day. However, sometimes those foods are not a priority in the students’ homes, and/or they are not part of their cultural diets. The social context in which decisions are made are important ones. Families, teachers, students need to be involved in food and nutritional issues in order to change the existing patterns.

Positivistic science has had an important impact in nutrition education. Nutrition educators have now an important challenge to move away from the nutritionist approach to one that is more critical. It is important also allow and encourage students to learn through experience and to reflect in their own knowledge. From my experience conducting this study within the ILLP project, I will say that we need, if our objective is to impact nutritional knowledge, to engage students in activities and discussions about food, which connects with their knowledge and beliefs, challenging them to re-think what
they are doing. This is not going to be an easy endeavor because food issues are complex ones. But we should try to do it, to challenge students to think about their choices and to arrive at their own conclusions. Children need to be seen as more active participants in their own health education, and that will help to resist the increasing pressure from the media, peers, and adult people in their lives, because that at least in the short term is not going to change.

Garden interventions for the purpose of nutrition education can and should expand beyond nutrition knowledge, to a child's comprehension of sharing, cooperation and, we need to encourage children to question their actions. This is a shift from the nutritionist/ medical approach that has been prevalent in nutrition education to a holistic approach.

Nutrition education frequently attempts to solve nutrition problems through changes in food choice, a high value behavior. It is therefore, necessary to explore the meanings people give to food, nutrition, and health and the values placed on these in relation to other value pursuits in life. While empirical and interpretative research approaches are necessary for nutrition education, some argue that they are not sufficient for solving nutrition problems. These problems require reflection and action upon the root causes of nutrition problems. The social world is the source of nutritional problems and there is an emancipatory interest to be served in nutrition education (Travers, 1997).
5.2 Limitations of the study

The data collection method, focus groups interviews, has advantages and disadvantages. An advantage as Hart, Bishop, and Truby (2002) mention, is that "Focus groups when applied to this age group (grades 4-5) allow the children more freedom to express their opinions, highlighting language and trains of thought which would not have been covered by a more structured approach" (p.138). However, a considerable disadvantage that I encountered, which Hart, et al. (2002) also reported in their study, is that a number of the children were reluctant to take up the opportunity to further "discuss" topics, and they were content with providing short, succinct answers. Consequently, I believe that I played a role beyond that of moderator. Instead, my role became a more traditional one in which I had to pose direct questions in an attempt to elicit more complex responses. This may have had the unintended effect of my asking some leading questions. This is one of the limitations of the use of this type of method.

Another relevant issue that came up from my experience conducting the focus groups and that has also been raised by other studies (Hart, et al., 2002; Lytle et al., 1997) was the phenomenon of children "parroting" learned responses. Furthermore, in some cases, students would echo answers given by their fellow participants, leading to all participants coming up with the same answer for particular questions.

The limited experience of the researcher is an important point that needs to be mentioned. This was the first time that I conducted focus group interviews, and I found it very challenging. My participation as a research assistant in the Intergenerational Landed Learning Project allowed me to develop a close relationship to the students who
participated in the project at UBC Farm. This was a mixed blessing when conducting the interviews. The advantages were that the students were comfortable in my presence, they showed enthusiasm about being interviewed, and they were generous in sharing their experiences. However, the close relationship also played out as a disadvantage. This became evident once I read the interviews; in some cases, the students were searching for answers that they thought would please me instead of sharing their own beliefs and thoughts. In the comparison group, the students were not looking for this type of acceptance.

Additional limitations of the study involve issues that arose in situ at the school with the students. A clear example of this was that I was not made aware of the fact that the students were allowed to have lunch at home. The absence of some students during lunchtime affected my data collection, resulting in fewer than expected student interviews.

5.3 Further research

This study provides important insights about students’ understandings about food and nutrition, due to the exploratory nature of it; emerging issues need to be considered as areas for further research.

Research has shown that children are well informed about healthy foods, they are literate about health issues regarding food, but do not readily incorporate this knowledge into action. Investigating this gap between knowledge and actions has much relevance to nutrition education in order to be effective.
Garden-based nutrition education normally has been part of the school experience. Gardens have been used as an educational tool, as formal and informal settings. An important issue that I think needs to be explored is how can we blend informal and formal learning in an effective way.

There is a need for research that addresses the use of qualitative methodologies with children. Research that frames nutrition education in a different perspective under a different paradigm than the one that have been employed is urgent. Long-term influences of garden-based learning needs to be researched to better understand its value and impact.

Food is a familiar domain for everyone. Why we do not teach nutrition through food? I think a different approach is needed to teach food and nutrition issues. We need to be able to reconnect with the other and recognize us as a part of larger systems and recognize and understand that our actions now will have an impact in the future and in the big picture. We need to change the individualistic vision for one that encompasses the others. Through my experience as a part of the ILLP there are some important points that lead me to believe that a space like the one that provides the ILLP could contribute to a new approach to teaching and learning, in which the traditional boundaries of subject disciplines that prevail in the educative system could blend into a more cohesive and contextual experience, and in which topics like nutrition and food could be discussed in a more tangible experience for the students. I think this is feasible and desirable.
References


Appendix A: Interview Questions

Unpacking Your Lunch

1. Can you tell me what are you having for lunch?
2. How do you like it?
3. Did you chose what you get for lunch or did somebody do it for you, who?
4. Which is your favorite food?
5. What is your least favorite food?
6. Do you think your favorite food is healthy?
7. Which food in your lunch would you say is healthy? Can you explain what you mean when you say it is healthy?
8. What are good/bad foods (for you)? Why? (What foods are bad for you teeth?)
9. Which foods can be grouped together? Why \textit{Are there any foods in your lunch that are similar to each other – how? in what ways...?}
10. Do you or your parents have rules for the food?
11. How many meals do you have per day? Which is your favorite? Why?
12. Which of your foods come from a farm? Have you been to a farm (other than UBC Farm) before – [please explain]
13. What do you think is the importance of farms?
14. What do you think is the importance of plants?
15. Is there anything that you would like to tell me or ask me?

Thanks a lot.
Appendix B: Consent Form

Department of Curriculum Studies
Faculty of Education
2125 Main Mall
Vancouver, B.C. Canada V6T 1Z4

Telephone (xxx) xxxxxx
FAX (xxx) xxxxxx
Email xxxxx@ubc.ca

Consent Form for Student/Parents

Project: Educating for the Environment through Intergenerational Community Learning

Principal Investigator: Dr. Jolie Mayer-Smith, Assoc. Professor, Faculty of Education, Department of Curriculum Studies, University of British Columbia, Tel 604-822-5293, email: xxxxx@ubc.ca

Co-Investigators:
Dr. Linda Peterat, Professor, Faculty of Education, Department of Curriculum Studies, University of British Columbia, Tel xxxxxx, email: xxxxx@ubc.ca

Ms. Oksana Bartosh, Ph.D. Graduate Student, Faculty of Education, Department of Curriculum Studies, University of British Columbia, email: xxxxx@yahoo.com

Ms. Stacy Friedman, M.A. Graduate Student, Faculty of Education, Department of Curriculum Studies, University of British Columbia, email: xxxxx@yahoo.com

Ms. Laura Estrada, M.A. Graduate Student, Faculty of Education, Department of Curriculum Studies, University of British Columbia, email: xxxxx@eos.ubc.ca
Ms. Tathali Urueta-Ortiz, M.A. Graduate Student, Faculty of Education, Department of Curriculum Studies, University of British Columbia, e-mail: xxxxx@yahoo.ca

**Purpose:** The purpose of this project is to investigate the problem of how to promote environmental awareness and concern for the planet earth. Specifically we are exploring what conditions and experiences contribute to the development of environmental stewardship and healthy lifestyle attitudes in young people. To understand this issue we are looking at how classroom-based and intergenerational community-based experiences impact students’ views and actions towards the earth.

**Procedures:** We are seeking your permission to include your child in the classroom-based portion of the study described above. If you provide written consent for your child’s participation by signing this form, your child will be invited to complete a short (15 minutes) Student Questionnaire once during the spring semester. You child will also be invited to participate in a 30-minute audiotape group interview (involving 4-5 students plus the interviewer) during the semester. From among those who volunteer for group interviews, up to 20 students will be randomly selected to participate. Not every student who volunteers and gives assent will be interviewed. The Student Questionnaire and the interview will explore children’s views and attitudes towards the planet.

The questionnaire and interview activities will take place at school during regular school hours during recess or lunchtime or through a time arranged by your child’s teacher. The total expected time for all activities will be no more than 60 minutes from February 2007 to June 2007. Your child’s participation in the project’s data collection procedures is entirely voluntary and will not affect their participation in classroom activities in any way.

If you choose not to allow your child to participate in this study, your child will not complete the Questionnaire or participate in the group interviews. Your child’s grades, his/her relationship with the teacher, and his/her relationship with the school will
not be affected in any way if you choose not to allow your child to participate in this study.

Confidentiality:

By agreeing to participate, please be assured that:

All data collected will be confidential with the researchers listed at the beginning of this form and through the following procedures.

1 Your child’s name will not appear in any written documents of the project. In addition any reference to your child’s school will remain strictly confidential.

2 All data will be kept in a locked space accessible only by the researchers.

3 You may review the audiotapes and the data collected that pertains to your child at any time.

You may refuse to allow your child to participate in this study, or withdraw your child at any time, without prejudice, even if you sign this letter of consent.

At any stage in the study you may request clarification on any issue regarding this study. This study will NOT involve risk of any kind.

Contact:

If you have any questions or desire further information about this study, please contact the principal investigator, Dr. Jolie Mayer-Smith, at XXXXXXXXXX, or by email at xxxxx@ubc.ca. If you have concerns about your rights or treatment as research participants, you may contact the Director of the UBC Office of Research Services at XXXXX.

Consent:

If you are willing to permit your child to participate in this project please complete the consent form on the next page. Please keep the project information pages for your own reference. Thank you.
FOR PARENTS TO SIGN

TO PARTICIPATE IN THE EDUCATING FOR THE ENVIRONMENT PROJECT, PLEASE RETURN THIS COPY OF THIS CONSENT FORM

Please check the box indicating your decision

[ ] I CONSENT to my child’s participation in the above stated study and agree to his/her participation in the study activities described in the attached form. I have read the attached form and understand the nature of my child’s participation in this study. With my consent I acknowledge receiving a copy of the project information.

[ ] I DO NOT CONSENT to my child’s participation in the study activities described in the attached form.

Child’s Name (please print): ____________________________________________

Parent/Guardian Name (please print): __________________________________

Signature: __________________________________ Date: ________________

(Please return this consent form to your child’s teacher Ms. /Mr. ______, at ________ School who will forward the form to the principal investigator Dr. Jolie Mayer-Smith at UBC).
FOR STUDENTS TO SIGN

TO PARTICIPATE IN THE EDUCATING FOR THE ENVIRONMENT PROJECT, PLEASE RETURN THIS COPY OF THIS CONSENT FORM

Please check the box indicating your decision

☐ I CONSENT to my participation in the above stated project and agree to complete the Student Questionnaire. I have been informed about the project activities by my teacher and the project researchers and understand the nature of my participation in this project. With my consent I indicate that I have received a copy of the project information.

☐ I DO NOT CONSENT to my participation in the project activities described in the attached form.

FOLLOW-UP INTERVIEWS

As a part of the research project we invite you to participate in one 30 minute interview (in April). The interviews will be conducted at school before or after class time or during recess time.

Please check the box indicating your decision

☐ I VOLUNTEER to participate in interviews for the above stated project

☐ I DO NOT volunteer to participate in the interviews.

Your Name (please print): ____________________________

Signature: ____________________________ Date: ____________
(Please return this consent form to your teacher Ms./Mr. _______, at ________ School who will forward the form to the principal investigator Dr. Jolie Mayer-Smith at UBC).
Appendix C: UBC Research Ethics Board Certificate of Approval

The University of British Columbia  
Office of Research Services  
Behavioural Research Ethics Board  
Suite 102, 6190 Agronomy Road, Vancouver, B.C. V6T 1Z3

CERTIFICATE OF APPROVAL - MINIMAL RISK AMENDMENT

<table>
<thead>
<tr>
<th>PRINCIPAL INVESTIGATOR</th>
<th>DEPARTMENT</th>
<th>UBC BREB NUMBER</th>
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</thead>
<tbody>
<tr>
<td>Jodie Mayer-Smith</td>
<td>UBC/Education/Curriculum Studies</td>
<td>H02-80400</td>
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INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Site</th>
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<td>N/A</td>
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Other locations where the research will be conducted:

John Henderson Elementary School, Vancouver  
Graham Bruce Elementary School, Vancouver  
Maple Grove Elementary School, Vancouver

CO-INVESTIGATOR(S):

Stacy Friedman  
Joksana Bartosh  
Ithali Urueta  
Laura Estrada  
Linda B. Peterat

SPONSORING AGENCIES:

Hampton Research Endowment Fund - "Educating for the Environment Through Intergenerational Community Learning" - "Cultivating Environmental Stewardship in Young People through an Intergenerational Landed-Learning Experience on UBC Farm"

Social Sciences & Humanities Research Council - "Cultivating Environmental Stewardship in Young People through an Intergenerational Landed-Learning Experience on UBC Farm"

PROJECT TITLE:

Educating for the Environment Through Intergenerational Community Learning

Expiry Date - Approval of an amendment does not change the expiry date on the current UBC BREB approval of this study. An application for renewal is required on or before: June 6, 2007

AMENDMENT(S):

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<thead>
<tr>
<th>Document Name</th>
<th>Version</th>
<th>Date</th>
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<tbody>
<tr>
<td>Consent Forms</td>
<td>Consent/Assent Form</td>
<td>N/A</td>
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</tbody>
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The amendment(s) and the document(s) listed above have been reviewed and the procedures were found to be acceptable on ethical grounds for research involving human subjects.

Approval is issued on behalf of the Behavioural Research Ethics Board and signed electronically by one of the following:

Dr. Peter Suedfeld, Chair  
Dr. Jim Rupert, Associate Chair  
Dr. Arminee Kazanjian, Associate Chair  
Dr. M. Judith Lynam, Associate Chair

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