

DR. STIRLING MCDOWELL  
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FOR  
RESEARCH INTO TEACHING



## **TEACHING AND LEARNING RESEARCH EXCHANGE**

### **Listen to the Future: Acknowledging the Voices of Students As They Focus on Their Health**

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# Author's Statement

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I walked into the school cafeteria and saw a teenage mother feeding her toddler potato chips from the vending machine. The toddler was delighted by her mother's attention, and the mother was feeding her daughter, high fat, high sodium potato chips. The mother had little choice of what to offer her daughter since the vending machines sell only soft drinks, potato chips and chocolate bars. The cafeteria sells plates filled with fries, and I knew that at noon, some students were eating this unhealthy fast food. Some teenage girls that I talked to refused to eat so they could watch their weight. I worried about the health of our students. I felt that we must do a better job of offering our children and our children's children nutritious food choices at school.

As an educator, a chef and a mother, I have worked with many adolescents, teaching them about food and nutrition. I teach healthy eating year after year and wonder if what I teach is making any difference in what they eat. I know that the average student learns each year about healthy eating. However, when I teach nutrition, their answers to my questions indicate that this knowledge has not been internalized. For example, most students can recite the contents of Canada's Food Guide, but when it is time for them to put the words into action, they cannot. Perhaps because students have a great deal of information to ingest each day, as educators, we need to be aware of what they are learning and make it relevant in their lives.

I wanted to investigate the minds of my students. I wondered what would happen if we gave them the information they needed to make healthy food choices. Would they understand the importance of healthy eating? I wondered what would happen if we took this information and helped students to make it their own through directed questions. Would it make a difference in their lives? I wondered if they internalized this information, would they take responsibility for what they ate?

I knew that in order for students to take responsibility for their own actions, they need to know what unhealthy eating is. For example, they need to know that if they consume soft drinks, it will add large amounts of sugar to their diets and rob their bodies of calcium. They need to know that if unhealthy fast food is consumed, it will result in an overload of fat. They need to know consumption of these foods will make their bodies become accustomed to the taste of excess fat, sugar and salt; and they will then crave sugar, fat and salt. They also need to realize that they are up against some formidable opponents to healthy eating, such as the food environment on campus, and off, and in the media. The first step in helping students become informed consumers is, therefore, to deliver the information they need.

My goal in undertaking this study was to listen to students' thoughts about healthy eating, to examine whether or not knowledge would make a difference in their eating habits, and to see how interested they would be in helping to promote a healthy school nutrition environment or take up 'the cause'. However, I was very careful not to pressure the students involved in any way. They were allowed to make up their own minds about responding to the challenge to take the practice of healthy eating a step further. At the very least, however, I expected that

the students would gain information necessary to make healthy personal food choices.

I hope the findings of this study and the recommendations of this research will be meaningful to people in all school communities. I hope that the results of this report will enable schools to offer healthy eating to adolescents. I believe that we need to advocate healthy eating and schools are the places where we can promote student wellness. I believe that we need to present teenagers with foods that nourish their bodies. I believe that teenagers need to take responsibility for their own health because they are the only ones who can take responsibility for their health. It is our responsibility, as educators, to promote healthy food choices at schools. During the course of my study, I have met many people who are pursuing similar goals.

I hope that this study will enable students to make decisions and to advocate what they need in their lives. I believe that this study will be instructive to others who strive for student wellness. What I have shared in this report is the experience of the research as I listened to students as they focused on health.

# Introduction

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*If you are here to help me, then you are wasting your time; but if you come because your liberation is bound up in mine, then let us begin.*  
Lily Walker, Australia ([www.aboriginalsocialwork.ca](http://www.aboriginalsocialwork.ca))

The current generation of young people are consuming calories at an alarming rate. Even so, these children are suffering from undernourishment. Healthcare professionals define undernourishment or food insufficiency as a lack of proper nutrition (Alaimo, Olsen, & Frongillo, 2001, p.44). When adolescents consume foods high in calories, they are not eating healthy foods that are rich in nutrients designed to build strong bodies (Alaimo et al., 2001, p.44). There is mounting evidence that there will be serious health consequences if this trend is not reversed (Anderson, 1991, p.7). A number of reports in recent years have pointed toward increasing obesity among children and adolescents and the significant impact that soft drinks (unhealthy eating) have on childhood obesity (Johnson, 2000, p.295 Johnson & Fray, 2001, p.131, Tremblay & Williams, 2000, p.161; Troiano, Briefel, Carroll & Bialostosky, 2000, p.72).

In delivering nutrition classes in high school, I saw themes develop that were repeated each year. Students brought chips, soft drinks and chocolate bars to class and wanted to eat those for lunch. Stories about unhealthy eating surfaced, along with comments such as:

- I do not eat breakfast because I hate the way food tastes in the morning.
- I am trying to lose weight so I watch what I eat.
- How can anyone eat as much as this says we are supposed to eat?
- I only drink coffee in the morning.
- I do not drink water.
- I get up too late to eat breakfast.
- I don't eat vegetables.
- I save up my money to play the videos.
- We do not have those foods in our house.
- If you eat breakfast that makes me too hungry by lunch.
- I do not eat until I come home from school.
- I have a bag of chips and coke for lunch.
- I am addicted to slushes.

These comments warranted an informal survey to find out if they indicated a trend among high school students. I decided to find out what students were eating. The excuses that students used for not eating healthily developed into a study of what high school students were really eating.

Since a cross section of teachers and students were involved in learning about healthy eating, the survey could be extended across course curriculums. It involved seventy-five students in high school. Students involved in Commercial Cooking, Wellness and English classes were selected to participate in the survey. Students from grade nine classes at one large high school in Saskatchewan were given a food frequency recall form on which to record their intake of foods for one day. The data were collected and presented on a graph.

Some assumptions were used in graphing the statistical data from the survey:

- students needed to eat two food group items to warrant breakfast,
- students needed to drink water, and
- students needed to meet the basic minimum requirements of Canada’s Food Guide to Healthy Eating in order to be healthy.

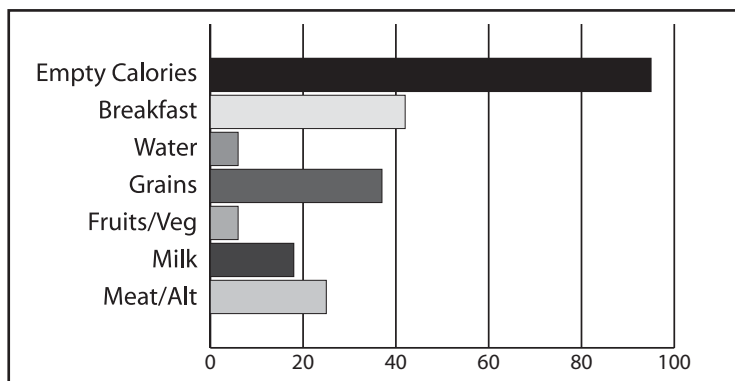
If all students were eating what they needed to be healthy, the graph of the survey data should show high numbers for all food groups and include drinking water and eating breakfast. The numbers for the “other” category, which was defined as foods eaten only on occasion, should be the lowest bar on the graph.

This graph represents the results of the survey of high school students who filled out a 24-hour food frequency recall. It shows that the lowest levels of servings that they consume are for food categories in Canada’s Food Guide for healthy eating. According to the guide, the minimum daily requirements for teenagers include:

- Breakfast = two food groups, for example, milk and cereal
- Water = minimum of four glasses per day
- Grains = minimum of five servings per day; one serving equals one piece of bread.
- Fruits and vegetables = minimum of five servings per day; one serving could be an apple
- Milk = minimum of three servings per day; one serving could be a glass of milk
- Meat = minimum of two to three servings per day; one serving is 30 grams of meat
- Empty calories = less than 10% of daily servings

Students who make healthy eating choices according to Canada’s Food Guide should consume at least the minimum requirement for each of these categories. They should consume a minimum of other foods because they represent empty calories and have too much fat, sugar or salt.

### Percentage of High School Students’ Food Intake by Food Type: Eating Habits of High School Students Age 15-17



This graph tells us that these students are not eating the basic minimum requirements of Canada's Food Guide, but are consuming a large amount of foods that fit into the empty (other) calories list. The students who took part in the 24 hour food intake survey are under-nourished.

Students are fighting a battle to eat for nutrition as opposed to eating high calorie/low nutrition fast foods (Neumark-Sztainer, Story, Perry, & Casey, 1999, p.8). Their opponents are the media, politics, and peer pressure (Hermann, 2001, p.10). Innovative measures are needed to get all young people excited about making healthy eating choices. Research needs to be done that examines food issues through the eyes of students and asks them to elaborate on effective ways of communicating about food and nutrition. This research needs to be active, meaningful, and relevant. Researchers need to ask students for their thoughts on how to eat healthily. For students to take ownership of the idea of healthy eating, they need to participate actively in the research. The purpose of this study is to challenge students to pursue a higher level of understanding about healthy food behaviours and help them develop techniques or standards that will guide their decisions.

*Research may be defined as a process of systematic investigation leading to increased understanding of a phenomenon or issue of interest. Though research is ultimately an ordinary activity, a process for looking again at an existing situation (or re-searching it) and seeing it in a different way, systematic processes of investigation provide the means for ensuring strong and effective processes of inquiry. (Stringer, 2004, p.3)*

As well, transformed understanding coming from this research could provide new concepts, ideas, explanations or interpretations that enable the students to see the world in a different way and therefore do things in a different, theoretically better, way.

# Research Proposal

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This study was designed to deliver a nutrition education curriculum to high school students. It asked students to create their own healthy reality and provided them with information they needed to practice healthy behaviours. Students were asked to examine the information so they could make changes in their eating habits. Using these learning experiences, participants could identify, advocate and construct realities that empowered them to take responsibility for their own health and the health of their peers. This research was designed to lead to social action.

The study provided a forum for students to understand the problems of healthy eating, as identified by the nutritionists who developed the unit of study, and use the information to practice healthy behaviours. It assumed that although students know Canada's Food Guide, they may not be using it in their daily selection of foods. After participating high school students were taught the program entitled Fluids Used Effectively for Living (F.U.E.L.), they were invited to talk about what changes they would make themselves, what changes they would make as a class and what changes they wanted implemented in the school. A focus group of students was asked three different sets of questions at the pre-intervention stage and the post-intervention stage, which involved one discussion immediately following the intervention and one three months later. During the post-intervention periods, students were asked to develop a list of strategies enabling change. "I have seen the excitement and wonder in the people's eyes, heard the wonder in their voices, and felt the excitement and even awe that comes with a new way of seeing, and sometimes a new way of being" (Stringer, 2004, p.3). The research documented the voices of teachers, parents, and administrators. In this project we listened to the voices of the students.

# Literature Review

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The project included an examination of the literature on healthy eating among adolescents. The results are divided into the following sub-headings: nutrition and health, self-esteem and eating, effects of poor eating, media influences, what adolescents are eating, and the role of the school. Findings from the literature discussing nutrition and health are in the first section. In the second section are findings that connect what students are eating and the consequences of what they are eating. This section is followed by a look at the effects of improper eating and self-esteem. Next comes a section discussing how the media influence student nutrition, and the final section examines the role that schools play in providing nutrition to adolescents.

## NUTRITION AND HEALTH

Not all young adults are eating healthy food. The Health Minister for the Province of Saskatchewan, John Nilson, (*Saskatoon Star Phoenix*, 2004), has announced that the provincial government is rolling out a plan to fight Saskatchewan's growing health problems. A big part of the plan focuses on improving the health of youth by enabling them to be more active and improve their eating habits. The goals include improved access to nutritious food and access to active lifestyles. Fast foods, unhealthy lifestyles, and harmful media prompting, coupled with the desire of young people to fit in with their peers, are proving to be formidable opponents to healthy eating among high school students.

The patterns of food consumption during adolescence have been recognized for a long time as not particularly healthy, and they may actually be harmful. Therefore, it seems prudent to pay much more attention to dietary habits formed during adolescence (Anderson, 1991, p.1). Adolescents need extra nutrients to support the adolescent growth spurt, which begins in girls at ages 10 or 11, reaches its peak at age 12, and is completed by about age 15. In boys, it begins at 12 or 13 years of age, peaks at age 14, and ends at about age 19 (International Food Information Council, 2004). Adolescents need nutrients for growth and development; however, they may instead develop unhealthy eating habits leading to inadequate nutrient intake. This situation may have long-term health implications, placing adolescents in a nutritionally vulnerable position for chronic disease. As Anderson (1991, p. 1) states, "unhealthy nutrition will affect high school students by not allowing their bodies to grow properly, and will also affect their life health". Anderson also states that:

1. Fat intake during adolescence may be associated with increased risk for coronary heart disease.
2. Low dietary calcium intake has been shown to lead to low bone density in adolescence, as well as the possibility of osteoporosis later in life.
3. Behaviour patterns developed during this period are likely to influence long term behaviors.

Nutrition is important to people of all ages, but it is particularly important to adolescents. "Well nourished adolescents are more likely to be better prepared to learn, to be active, and maintain their health as adults" (Ontario Society of Nutrition Professionals in Public Health, p.1). According to dietitians in Canada, diet and exercise patterns adopted during an individual's prime developmental

years set the stage for lifelong habits that can mean the difference between health and infirmity in later life. What is pivotal about adolescence is that at this stage, young people often insist on making their own food choices. If adolescents can be encouraged to make healthy eating choices, not only will they provide their bodies with appropriate nutrients for final growth and development, they also will put into place important patterns for the rest of their lives. This is the time when they need the nutrients and they need to learn what to eat, when they are taking control over what they put into their bodies and for the first time are making choices for themselves.

## HOW HEALTHY EATING HABITS ARE ESTABLISHED

The high school years are when young people set lifelong habits that can be the springboard for healthy futures. Students at this age are taking control of their own eating habits. They associate junk food with snacking, friends, being away from home, independence and having fun (Neumark-Sztainer et al., 1999, p.2). Certain activities that are fun are associated with certain foods. By providing students with an environment that promotes positive choices that lead to healthy eating, we are helping them to avoid unhealthy lifestyles. The Surgeon General reports that “excessive weight in children and adolescents is generally caused by lack of physical activity, unhealthy eating patterns, or a combination of the two, with genetics and lifestyle both playing important roles in determining a child’s weight” (Surgeon General’s Report, August 12, 2004). According to the Center for Disease Control, over nine million young people in America are overweight, making the need to promote nutrition and health a public priority. Jay Hendricks, editorial director of Rodales Sports and Fitness magazine, believes that the number of overweight American children has tripled in the past forty years.

While this study is focused on healthy eating, it should also be noted that lack of physical activity is also a factor contributing to malnutrition of students, as pointed out in Canada’s Food Guide. There are several causes for inactivity. Our society has become very sedentary. Television, computer and video games contribute to children’s inactive lifestyles. Forty-three per cent of adolescents watch more than two hours of television each day (International Food Information Council, 2004). Children, especially girls, become less active as they move through adolescence (Hendricks, 2003, p.1). One solution to the problem of inactivity is to bring back aimless outdoor play. Just acting like a kid once a day can make the difference in body weight of a pound a month (Hendricks, 2003, p.1). Nutritionists agree that exercise is particularly important for our children. Exercise not only provides benefits such as healthy heart, reduced body fat and increased muscle mass; it allows children to socialize with other children and build self-esteem (nutrition.com.sg). There is a well-documented link between appropriate exercise, proper nutrition, and behavioural issues, such as stress management.

## SELF-ESTEEM AND EATING

A study conducted by the Children’s Exercise and Nutrition Center in Hamilton, Ontario, showed that the diets of both obese and non-obese children are nutritionally poor and high in empty-calorie sugars, fats, and foods that should be considered as ‘extras’. This situation was, however more prevalent among children in the obese group (Gillis, 2001, p 62). Often, when reporting on nutrition, obesity is noted as a major symptom of poor nutrition. While one cannot dismiss the prevalence of obesity or the severity of this symptom, care should be taken not

to discriminate against the overweight. The need to draw attention to these health issues should never outweigh the psychological stress on the 'victims'.

The most immediate consequence of being overweight, as perceived by the children themselves, is social discrimination. This discrimination is associated with poor self-esteem and depression (Surgeon General's Report, August 12, 2004). This report recommends:

- Let your child know he or she is loved and appreciated whatever his or her weight. An overweight child probably knows better than anyone else that he or she has a weight problem. Overweight children need support, acceptance, and encouragement.
- Focus on your child's health and positive qualities, not your child's weight.
- Try not to make your child feel different if he or she is overweight but focus on gradually changing physical activity and eating habits.
- Be a good role model for your child. If your child sees you enjoying healthy foods and physical activity, he or she is more likely to do the same now and for the rest of his or her life.

Being overweight has the negative connotations of going off a diet, being out of control, overeating, and feeling guilty. Healthy food is associated with family, home and meals, being on a diet, being concerned with weight and appearance, self-control, and being good. Overall, girls' categorization of foods as junk or healthy appears to have more to do with social issues and concerns with weight and body image than with health issues (Neumark-Sztainer et al., 1999, p.2). As a result, there is the potential for harm in a primary focus on obesity in adolescents, which can lead to psychological stress, growth failure, and eating disorders.

Children get the message that being overly fat (measured against a questionable standard) is bad. The overweight child translates this to mean that he or she is not okay, which has a powerful negative effect continually reinforced unintentionally by the medical and health professions. The consequence is that youth ridicule fat people and idolize the slender, unrealistic, and often unhealthy body size and shape portrayed as desirable in the media (Neumark-Sztainer et al., 1999, p.2).

Adolescents need to be able to take charge of their lives and make healthy choices. Students who have low self-esteem are less likely to do this successfully. However, action research is one vehicle that may encourage overweight students to make positive food choices. The sense of power that comes with participatory action research helps them take charge of their lives. In the *Journal of the American Diabetic Association*, 1997, AbuSabha and Achterberg state that most intervention studies assessing self-efficacy indicate that increasing knowledge, training, experience, and/or familiarity with a task are likely to increase self-efficacy (American Diabetic Association, 1997). Calhoun, in her paper on educational leadership, also states that social action attempts to change conventional structure. Individuals who are characterized by pervasive self-rejection (stigmatized identities) may attempt to attain or restore self-acceptance by participating in collective social action (AbuSabha et al., 1997, p.2). Calhoun, in addition, contends that "by participating in social action, individuals reject conventional standards, define participants as intrinsically worthy, redefine stigmatizing attitudes and successfully attain goals that have positive self-significance" (AbuSabha et al., 1997, p. 4). Therefore, when teaching or learning about health and adolescents, we need to be sensitive to the specific needs of those who are

overweight. This sensitivity is crucial to enabling those individuals to attain or restore self-acceptance. Self-acceptance, in turn, will lead to attaining goals of positive significance.

Ideas relating to positive self-esteem and participatory social action research also surface in social movement literature. Gamson (1992) observes that “participation in social movements frequently involves enlargement of personal identity for participants and offers fulfillment and realization of self.” Teske and Balsler (1986) also observe that “activism enables activists to develop and live according to concerns rooted in a sense of who they are and who they want to be.” Armed with education and research, students are then able to make changes that will in turn improve self-esteem.

A study conducted by the Children’s Exercise and Nutrition Center showed that the diets of both obese and non-obese children are nutritionally poor (Ontario Society of Nutrition Professionals in Public Health, 2004, p.6). Care should be taken when presenting healthy choices to adolescents. It is not only overweight students who have poor nutrition. Obesity is only one symptom of poor nutrition. When presenting healthy choices to students, care must be taken to address all their nutritional needs, not just those of the obese. The need to draw attention to the problem of poor nutrition should never be more important than the students. The avoidance of psychological stress in overweight adolescents must remain a priority, and focus placed on the campaign to end poor nutrition for all adolescents.

“The quality of children’s diets is declining; while at the same time the emphasis on test scores and the concerns about disciplinary problems in schools are increasing” (Arlington, 2001, p.3). A link that needs to be examined is that between behaviour and eating habits. Inadequate nutrition during childhood can have a detrimental effect on children’s cognitive development. Food-insufficient teenagers are more than twice as likely to have seen a psychologist, almost three times as likely to have been suspended from school, almost twice as likely to have a lot or some difficulty getting along with others, and four times as likely to have no friends (Alaimo, Olsen & Frongillo, 2001, p.7). The energy provided by the calories, intended to make their minds and bodies strong, may instead be destroying their ability to function effectively.

Research has shown that children who do not eat breakfast risk poor cognitive development (Alaimo et al., 2001, p.7). Under-nutrition can have lasting effects on cognitive development and academic performance. When students are hungry or undernourished, they are irritable, have difficulty concentrating, and experience low energy, all of which can impede learning. Skipping breakfast can have an adverse affect on performance in problem-solving tasks, which in turn can interfere with academic performance. In addition, when young people are hungry or undernourished, they are prone to illness and infection, which causes them to miss school and fall behind in classes (Consumer Publication: Hunger, Poverty and Nutrition Policy. Center on Hunger, Poverty and Nutrition Policy, 1995).

This link between nutrition and learning is also supported by the Community Childhood Hunger Identification Project study, which examined the relationship between hunger and psychosocial functions among low-income, school-aged children. Analysis showed that virtually all behavioural, emotional and academic problems were more prevalent in hungry children. Aggression and anxiety had the strongest degree of association with hunger (Alaimo et al., 2001, p.7). The combination of unhealthy eating and lack of exercise is causing aggression,

anxiety, poor cognitive development which results in low academic performance, and discipline problems in schools.

Young people have been shown to be undernourished, yet they consume more calories than their bodies need. The foods they are consuming are not nutritious. Although much individual variation exists in food preferences, teens tend to prefer the taste of many “junk” foods, and dislike many “healthy” foods (Alaimo et al., 2001, p.7). Dr. Susan Whiting, a University of Saskatchewan Professor of Nutrition and Dietetics, “found that a large percentage of Saskatchewan teenagers who drink soft drinks and other low-nutrient beverages, such as punch or sugary drinks made from powder, drink less milk. The Canada Food Guide recommends four glasses of milk per day for an adolescent so as this is replaced by soft drinks the risk for fractures and osteoporosis goes up” (Vatanparast & Whiting, 2004, p.256). Dr. Whiting also suggests that students need to understand the importance of drinking healthy beverages. She advises teens: Don’t have sugary beverages at mealtime; choose milk or water to go with meals instead. She stresses that milk provides not just calcium but other nutrients that are important for bone development, such as riboflavin and vitamins A and D. “Everyone loses bone mass as they age so building up bone mineral content when you’re young delays the onset of osteoporosis” (Vatanparast, Whiting, 2004, p.256). Whiting notes there is a two-year window during early adolescence when roughly 25 per cent of total bone mass is accumulated, so it is critical that young teens get the minerals necessary for bone growth (Vatanparast, Whiting, 2004, p.256). Experts such as Travis (2001) estimate that for every five per cent increase in adolescent bone mass, there is a 40 per cent decrease in the risk of bone fractures later in life. There is a limited time window in an individual’s development to deposit calcium into bone. Bones grow and incorporate calcium rapidly during teen years (Travis, 2001, p.3). Often adolescents who drink soft drinks do not consume milk or water, thus depleting their calcium levels even further. Ludwig, Peterson & Gortmaker (2001, p.335) reported that each 12 oz (355 ml.) sugar-sweetened beverage consumed by children 11-12 years old over a 1 ? year period increased the risk of becoming overweight by 60 percent, an association not found with “diet” (sugar-free) soft drinks. Similarly, in reviewing data pertaining to children and youth aged 2-19 years, Troiano, Briefel, Carroll & Bialostosky (2000, p.72) found that sweetened beverages contributed 20-24 percent of energy across all ages, and sweetened drinks provided eight percent in the diet of adolescents. In all age groups, added sugars from soft drinks represented a higher proportion of energy (calories) in the diet of overweight children and youths than they did in the diet of those who were not overweight. This information, coupled with evidence of poor cognitive development, suggests that adolescents need to make positive food choices. Negative consequences on students’ ability to learn can occur if students do not eat well.

*Under nourishment has an impact on children’s behavior, school performance and their ability to concentrate and perform complex tasks. Children’s brain function is diminished by short-term or periodic hunger or malnutrition caused by missing meals (Tufts University Center on Hunger, Poverty & Nutrition Policy, 1994)*

Under-nutrition can have lasting effects on cognitive development and academic performance. When students are hungry or undernourished, they are irritable, have difficulty concentrating, and experience low energy, all of which can impede learning. Missing breakfast, skipping lunch, eating inadequate meals seems to be the norm for a lot of high school students. Some students do not eat until they come home from school at noon or even after school. Analysis showed that

virtually all behavioural, emotional and academic problems were more prevalent in hungry children. Aggression and anxiety had the strongest degree of association with hunger. Poor nutrition choices have negative consequences.

## MEDIA INFLUENCES

Research shows adolescent obesity and poor body image are among the consequences of excessive television watching. Excessive television viewing is defined by the Canadian Guide to Healthy Living, which recommends that people watch no more than two hours of television per day. A 1999 study found that adolescent girls who wanted to look like females on television were more likely to develop disordered eating (Neumark-Sztainer, Story, Perry & Casey, 1999, p.1.). Teenagers' foods choices also can be influenced by social pressures to achieve cultural ideals of thinness or athletic prowess, gain peer acceptance, or assert independence from parental authority. Young women seem especially vulnerable to pressures from advertising and frequent promotion of low nutrient density foods on television. Teenagers today are more exposed to more unhealthy messages than in any other time in history. In the magazine *Nutrition Today*, Anderson states that an important factor contributing to changes in adolescent behavior has been the pervasive influences of television (Anderson, 1991, p.1). She further claims, "... television viewing specifically as the leading detriment associated with early life obesity rather than excessive dietary intake" (Anderson, 1991, p.4). An increasing abundance of high fat, high sugar foods that are readily available and easily accessible as a result of aggressive marketing by media, supermarkets and restaurants has been found to be connected to increased obesity and decreased fitness behaviors (Travis, 2001, p.2). Media activist Jean Killbourne concludes, "Women are sold to the diet industry by the magazines we read and the television programs we watch, almost all of which make us feel anxious about our weight. We disappear in reverse - by revamping and revealing our bodies to meet externally imposed visions of female beauty" (Killbourne, <http://www.mediascope.org/pubs/ibriefs/bia.htm>). The barrage of messages about thinness, dieting and beauty tells 'ordinary' women that they are always in need of adjustment - and that the female body is an object to be perfected (Government of Canada, 1996, p.3). Female adolescents are taught that they must be an 'ideal' weight just to survive, and if they are less than perfect, they must buy a product and work hard to fit in with their peers.

Another consideration is how the media constructs, informs and reinforces prevalent ideas about men and masculinity. It is not only girls who are compartmentalized, but also boys. Author and academic Susan Bordo has analyzed gender in advertising and agrees that men are usually portrayed as virile, muscular and powerful. Their powerful bodies dominate space in advertisements. For women, the focus is on slenderness, dieting, and attaining a feminine ideal; women are always presented as not just thin, but also weak and vulnerable (Bordo, 2004, p.3). These critics and others suggest that, just as traditional advertising has for decades sexually objectified women and their bodies, today's marketing campaigns are objectifying men in the same way. A 2002 study at the University of Wisconsin suggests that this new focus on fit and muscled male bodies is causing men the same anxiety and personal insecurity that women have felt for decades (Government of Canada, 1996, p.3).

Students often believe what they are told by media. The messages that run across the television screen are effective. Young teenage girls believe that they must be thin to be accepted. Students are quite likely to accept the subconsciously

communicated message from television: young, skinny, pretty girls have more fun and are more popular. Men must be in control, make more money, and be physically powerful. To become happy and popular, girls must become thin, rich and white. Dissatisfaction with body image and the unhealthy eating behaviors that may result are important issues for adolescents.

The influence of the media raises ethical concerns for educators. Students are not only subjected to advertisements by watching television at home, but they now see the same brands advertised at school. Vending machines are accessible in high schools in Saskatchewan. (Henry, 2004 p.74) made the point that for companies such as Pepsi and Coca-Cola, reaching students is an important strategy in establishing brand loyalty. Critics question the ethics of marketing unhealthy food and beverages to adolescents in high schools (Henry, 2004 p.74). The goals of schools may be compromised when corporations display their products, have exclusive selling rights to students, and promote unhealthy foods and beverages. Molnar (2002) argues that school children are being approached as consumers rather than as learners and citizens. Advertisements and the promotion of non-nutritious food products in schools encourage students to consume unhealthy food. Beyond concerns about commercial interests in schools, critics point to the health trade-offs, questioning whether the profits made from selling products from vending machines are worth the potential dangers that products from these machines pose to students' health (Henry, 2004, p.4). Although adolescents' health is not solely the responsibility of schools, schools can assist them by creating an atmosphere that teaches and supports health and provides opportunities for healthy behaviours (Henry, 2004, p. 76).

## ADOLESCENTS' EATING HABITS

The National Center for Health Statistics (2004) President, John Allerrante, published a commentary that addresses adolescents eating habits. He contends, "Growing evidence suggests that the nation's health and education goals are inextricably linked: students with health problems simply are not as ready or as capable to learn." He also states that "it is apparent that an entire generation of inactive children and adolescents is at pronounced and growing risk of developing a host of serious and costly diseases in later life" (Allerrante, 2004, p.8). He cites the following reasons for the poor health: "we do know that consuming high-fat, super-sized fast-food meals and soft drinks with high sugar content; and being physically inactive are contributing to children's being overweight and obese." Again we need to look at all the students and ways to improve their eating habits. He also contends that "the substitution of fast food vendors and corporate-sponsored vending machines for nutritious cafeteria meals in many schools exacerbates the problem." The reality is that students are eating foods that are high in fat and sugar content, drinking soft drinks, and not eating foods that will help their bodies grow.

Health and weight can be affected by over-consumption of minimally nutritious foods high in calories, fat, salt and sugar. The eating patterns of youth significantly impact their health. Poor eating habits with low intakes of foods from any of the four food groups may result in deficiencies of essential nutrients such as calcium and iron. Also, substantial research indicates that healthy eating habits potentially play a role in preventing several adult onset chronic diseases (Ontario Society of Nutrition Professionals in Public Health p.7). Adolescents who do not eat healthily are in danger of not getting essential nutrients that will affect their health throughout their lives. Recent Canadian data show low median intakes for most

of the food groups in Canada's Food Guide to Healthy Eating for both genders and across several grade levels (Hanning and Jessup, 2002). More specifically:

- Children ...are consuming decreasing amounts of vegetables and fruits...with a larger decrease in raw vegetables.
- One quarter of the reported vegetables consumed was French fries.
- Only 36% of adolescents between the ages of 12 and 19 have five or more servings of vegetables and fruits per day. (National Centre for Health Statistics. Statistics Canada, 2002)
- Half of children do not consume milk for lunch. (Market facts, 1998)
- Only children who consumed milk for lunch met their minimum daily calcium requirements. (Johnson, 1998)

The consumption of foods with minimum nutritional value are displacing foods and beverages of higher value and may be contributing to the rising rates of overweight and obesity (Ontario Society of Nutrition Professionals in Public Health p.6).

## ROLE OF THE SCHOOL

Schools alone cannot meet all the nutrition-related needs of students. However, because the relationship between health, nutrition, physical activity and learning is so strong, and because young people spend so much of their time at school or at school-related activities, schools can be a vital part of the solution ([www.Californiaprojectlean.org](http://www.Californiaprojectlean.org)).

The Ontario Society of Nutrition Professionals in Public Health, in its call to action report, states:

*The primary goal of schools is to foster achievement in the interests of responsible citizenry. Since being well-nourished is an essential first step towards students' readiness to learn, schools, then must provide them with the skills, social support, and environmental reinforcements they need to develop and practice healthy eating behavior. (Ontario Society of Nutrition Professionals in Public Health, p.3)*

The nutritional professionals further challenge schools to act on their role in establishing a supportive nutritional environment. They state that because students spend a significant amount of their time at school, the school community is the place to create and promote healthy eating behaviors (p.1). Students are in school to learn how to be responsible citizens; therefore, students need proper nourishment to meet that need. Many students and staff eat at least one meal each day within the high school setting (Dixey, Heindl, Loureiro, Preez-Rodrigo, Snel and Warnking, 1999). Therefore, schools can teach students how to resist negative social pressures that influence eating. School-based programs can directly address peer pressures that discourage healthy eating. Schools are key in establishing healthy eating practices and providing educational support for students to understand the connection between healthy lifestyles and accountability for health within the populace.

The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity suggests that:

*Schools are identified as a key setting for public health strategies to prevent and decrease the prevalence of overweight and obesity. Most children spend a large portion of time in school. Schools provide many opportunities to engage children in healthy eating and physical activity and to reinforce healthy diet and physical activity messages. Public health approaches in schools should extend beyond health and physical education to include school policy... Decisions about which options to select should be made at the local level. (Surgeon General's report)*

Schools should develop policies that enable student access to healthy food. Income from food sales and lack of education are listed as barriers to implementation of a nutrition policy. Food services providers in high schools also state that if students are not provided with 'junk' food, they will travel to neighbourhood stores and fast food places to purchase food. This train of thought enables those providers to justify selling unhealthy food (Berenbaum, 2004, p.16). In Saskatchewan schools, nutrition policy prepared by Dr. S. Berenbaum in April 2004 identifies the need for nutritious foods in schools. The most common barrier to setting guidelines and policies in schools is a lack of perceived need (Berenbaum, 2004, p.15). However, it may be argued that instead of accepting a lack of need to change, "environmental changes, such as providing healthier choices in vending machines, are more effective within the school system because it is not left up to the students to decide whether to modify their habits" (Dietz and Gortmaker, 2001). Among the policy recommendations Berenbaum makes is that "one should work toward creating an awareness of the need for a school food policy among the stakeholders who are students, teachers, principals, boards, community" (Berenbaum, 2004, p.ii). The report also suggests that "students provide positive suggestions for change" (Berenbaum, 2004, p.iv). By providing students with resources, suggestions, and strategies to improve their nutritional status, students can explore and understand that healthy eating patterns are essential for them to achieve their full academic potential and full physical and mental growth for lifelong health and well-being (Berenbaum, 2004, p.17).

Nutrition professionals in public health are witnessing a significant increase in school nutrition issues. The concerns include:

- The poor nutritional value of the foods available in schools, e.g., the food found in cafeterias and items sold as fund-raisers or offered during special events,
- An increase in vending machines in schools that sell foods and beverages with minimum nutritional value,
- The declining quality of food that students bring from home,
- An increase in instances of absenteeism, sleeping in class, eating disorders, and behavioural problems, and the growing need for strong academic performance in the face of a challenging curriculum (Ontario Society of Nutrition Professionals in Public Health, p.4),

These concerns about student nutrition, along with the strong relationship between diet and optimal learning, call for schools to invest both time and resources to combat this unhealthy reality faced by high school students.

The Center for Science in the Public Interest questions the validity of selling foods with low nutritional values. It points out that most children lack the skills to consider the long-term consequences of their actions. As a society, we have provided laws and regulations, such as those covering school attendance, use of tobacco and alcohol, and use of bike helmets, that protect children because of their

inability to make good decisions regarding their long- and short-term health needs. It is incumbent upon the school system, therefore, to foster healthy eating habits and to protect students from those who profit from children's growing consumption of foods with minimum nutritional value (Center for Science in the Public Interest).

Furthermore, the complexity of children's lives is compounded by more information every day on making food choices that ranges from the choices available in schools to media portraits of 'perfect' body types. Students need to recognize the problem of under-nutrition and want to take action to make healthy choices. Schools need to help establish support for them to do so. As Dr. Carol Henry states

*The use of schools as a marketplace for developing customer loyalty remains a primary concern because it is seen as contrary to the school's mission. The sale of soft drinks (and unhealthy food) remains a primary concern because it is seen as contrary to the schools mission ...and may therefore become an ethical concern for educational administrators. (Henry, 2002, p.83)*

It has been argued that schools benefit from contractual agreements with commercial companies such as Pepsi and Coke-Cola. Yet this argument begs the question: Is the short-term income received from corporate sponsors worth the price of the health of the students?

# Methodology

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*It is the position of the American Dietetic Association that access to adequate amounts of safe, nutritious, and culturally appropriate food at all times is a fundamental human right. Hunger continues to be a worldwide problem of staggering proportions. The Association supports programs and encourages practices that combat hunger and malnutrition, produce food security, promote self-sufficiency, and are environmentally and economically sustainable. (American Dietetic Association, 2003, p.1.)*

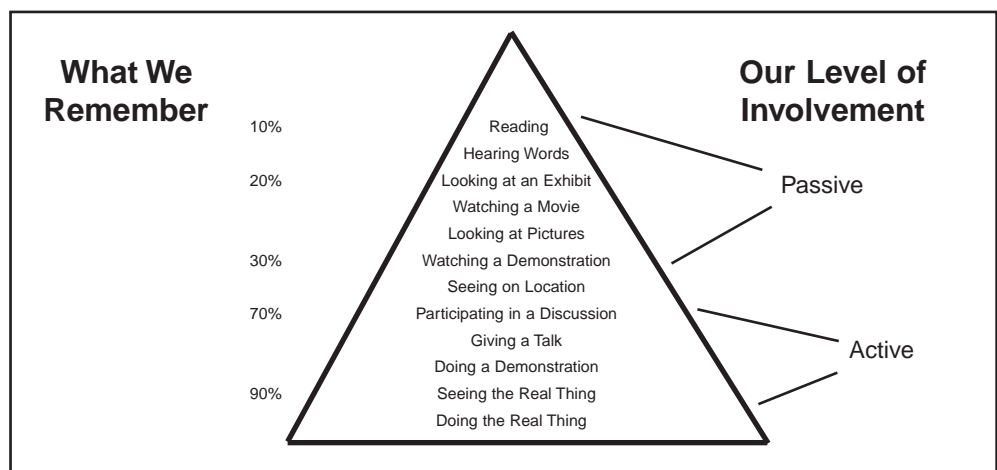
## CONSTRUCTIVIST TEACHING AND LEARNING

Knowledge learned in the classroom needs to be transferred outside of the classroom, or in other words, the knowledge learned in school must have practical implications for society. For transformation of behavior to occur, information is not enough. We can tell students the reasons for eating healthily, and even encourage them to demonstrate their knowledge by giving the information back in response to examination questions, but there is no way of ensuring that they will use this information in their lives. Somehow, we need to help them see the need to change their habits. What are needed are constructivist lessons, set in the context of their lives, that are oriented toward building knowledge and making changes in themselves.

Each student is an individual who must make sense of the material and construct his or her own meaning. For students who believe in eating what they like, when they like, changing habits may mean building on the knowledge presented and using it in the context of their own lives. For other students, it may mean that they need to take pride in themselves and treat their bodies with respect so they can pass their understandings to the next generation.

Figure 2 shows the importance of active manipulation and authentic experiences as a foundation for powerful, memorable learning. The concept it presents is a foundational element of constructivist learning and teaching.

## CONSTRUCTIVIST LEARNING AND TEACHING



## FIGURE 2: CONSTRUCTIVIST LEARNING AND TEACHING

As the figure shows, we need to teach children so they will remember what we have taught, but they then must use the material to construct meaning for themselves. What does this look like in the context of this project? Borrowing from *Designing Constructivist Learning Environments*, (<http://tiger.coe.missouri.edu/~jonassen/courses/CLE/>), a design for the project would include the following:

- *Active*. The learning process must engage students. Students learn by processing information when they are responsible for the results of learning. The learning process is mindful processing of information. When students are responsible for the results of learning, it then engages them. In the world outside of the classroom, children learn sophisticated skills and advanced knowledge in many areas. For example, in the world of the trades, apprenticeships play an important role. Students learn, and then do what they learn. Formal apprenticeships guide learning in the educational setting, but informal apprenticeships and communities at work and play help students to develop knowledge and skills that they then can practice and share with other members of the community. In this situation, learners are learning by actively manipulating the objects and tools of the trade and reflecting on what they have done. For students to be active and involved in their learning, the stakes must be relevant, they must be meaningful, and they must provide the students with hands-on experience.
- *Constructive*. Learners integrate new ideas with prior knowledge in order to make sense or make meaning. They construct their own meaning for different experiences. The models that they build to explain things are simple and unsophisticated at first, but with experience, support, and reflection, they become increasingly complex. They can only know what they know, so they should be supported in the process of coming to know.
- *Collaborative*. Learners naturally work in learning and knowledge building communities, exploiting each others' skills while providing social support and modeling and observing the contributions of each member. Humans naturally seek out others to help them to solve problems and perform tasks. By using the knowledge around them, students will use the others in their groups to create and build on shared knowledge.
- *Intentional*. All human behavior is goal-directed. These students will need to make healthy eating a goal. Their goal may be simple, e.g., satiating hunger, or it may be more complex, e.g., developing new school health policies. When learners are actively and deliberately trying to achieve a cognitive goal, they think and learn more. Learning environments need to support learners in articulating what their goals are in any learning situation.
- *Complex*. The greatest intellectual sin that we teachers commit is to oversimplify most ideas in order to make them more easily transmittable to learners. In addition to stripping ideas from their normal contexts, we distill them to their simplest form so that students will more readily learn them. What they learn from this process is that the world is a reliable and simple place. However, the world is not a reliable and simple place. Problems have multiple components and multiple perspectives and cannot be solved in predictable ways like the canned problems at the end of textbook chapters. We need to engage students in solving complex and ill-structured problems as well as simple problems. In this way, students will develop problem-solving skills that can enable them to problem-solve for the rest of their lives.

Instead of competing with other students, they then will be able to build on the knowledge that everyone brings to the table.

- *Contextual.* A great deal of recent research has shown that learning tasks that are situated in some meaningful real-world task or simulated in some case-based or problem-based learning environment are not only better understood, but also are more consistently transferred to new situations. By asking the students to take this real-world problem (students are not eating healthily) and develop solutions on their own, we teach knowledge and skills in the context of a real-life situation, and we provide a different setting for learners to practice their ideas.
- *Conversational.* Learning is inherently a social, dialogical process, i.e., given a problem or task, people naturally seek out opinions and ideas from others. When learners become part of knowledge-building communities both in class and outside of school, they learn that there are multiple ways of viewing the world and multiple solutions to most of life's problems. They learn to work with others, they learn to feed off the ideas of others, and they also learn their own strengths and worth.
- *Reflective.* Learners will be required to articulate what they are doing, the decisions they make, the strategies they use, and the answers that they found. They will have a chance to do that through recommendations to other schools and by trying out their solutions and evaluating the results. When they articulate what they have learned and reflect on the processes and decisions that were involved, they understand more and are better able to use in new situations the knowledge that they have constructed.

Constructive lessons must engage the students intellectually, physically, and emotionally. By asking students to translate their health and well-being into responsibility for their own actions, students will theoretically take positive actions to become or remain healthy.

## RESEARCH SITUATION, CONTEXT AND INFORMATION ROLES

Students from three grade nine English classes in one high school in Saskatchewan were asked to participate in the study. The school was chosen because of its diversity and large student population. It was considered that an English class would provide an appropriate venue for integrating nutrition education into the current education curriculum.

Two of the classes were matched by socio-economic status with the majority of the population from white middle class background. Each class had 25 students. The classes were assigned as either experimental (delivery by a nutritionist) or teacher-taught. Both students and teachers from each class selected were contacted and invited to participate in the small focus group discussions, questionnaires and 24-hour recall.

A third class, made up of students from a lower socioeconomic background, mainly from First Nations communities, also participated in the study and was teacher-taught. These students were asked to participate in the questionnaire and 24-hour recall. Instead of participation in a focus group discussion, these students were encouraged to write their thoughts on a questionnaire that was provided. This method helped to ensure proper class management.

Permission for student participation was obtained from the parents or guardians of all participating students and the students themselves. Letters of information were sent to the principals, English teachers, parents and the children of the three consenting classes.

The intervention for this study was F.U.E.L (Fluids Used Effectively for Living), a six-session multi-factorial curriculum designed to be highly focused and interactive. The intervention was developed taking into account the constructivist theory of learning. The framework for the intervention included concepts from Canada's Food Guide for Healthy Eating. The modules aim to:

- enhance knowledge and understanding about the importance of variety, balance, and moderation in making wise food and nutrition choices (measured in terms of fruit and vegetable consumption); and
- create an awareness in adolescents of the need to drink healthy nutritious beverages (fruit juice, milk and water) instead of sugary and carbonated drinks.

Each module included a lesson plan, activities (student worksheets, games, experiments etc), background information for teachers and students, handout materials, and evaluation activities. The original F.U.E.L (Fluids Used Effectively for Living) resource packages were developed by a research team from the University of Saskatchewan spearheaded by Dr. Carol Henry. I was involved primarily in the implementation of the intervention.

All participants received the nutrition education program. A qualified research assistant (registered dietitian) was hired to teach the six sessions in the class assigned as experimental. Students in the other classes received a similar presentation, except the students were taught by their teacher.

Members of the research team conducted the study. Research methods for the small focus group involved action research around the implementation of changes in the teaching of the food and nutrition program. In the focus group, student participants described (discussed) how their knowledge and attitudes were changing. Students made recommendations on improving their own health and the food and beverage environment of their school. The discussions were audio-recorded and transcribed. Students were provided with an opportunity to review the transcripts before they were entered into the final report at a time decided in collaboration with teachers. Themes were sought in the transcripts, and the interviews were analyzed using the constant comparative method.

## ASSESSMENT

The study employed three assessment techniques: focus group discussion, the Food Frequency Questionnaire, and 24-hour recall. Each type of assessment was conducted at baseline (one week before intervention), and a post-test was done (one week following the intervention and three months following the intervention). A discussion of this process and the subsequent findings for the Food Frequency Questionnaire and 24-hour recall is beyond the scope of this report. Dr. Carol Henry and Dr. Susan Whiting (College of Pharmacy and Nutrition) will construct and prepare summaries of the FFQ and 24-hour recall. Only the methods and findings from the focus group discussions will be presented here.

This report focuses on the focus group discussions that occurred during the pre-intervention and post-intervention periods. After students completed the lessons in F.U.E.L. (Fluids Used Effectively for Life), I interviewed them using questions based on the materials taught in class. Their responses were used to understand if the students were using the information given them and to establish what the students did with the information provided. An action research model fits the research that I conducted.

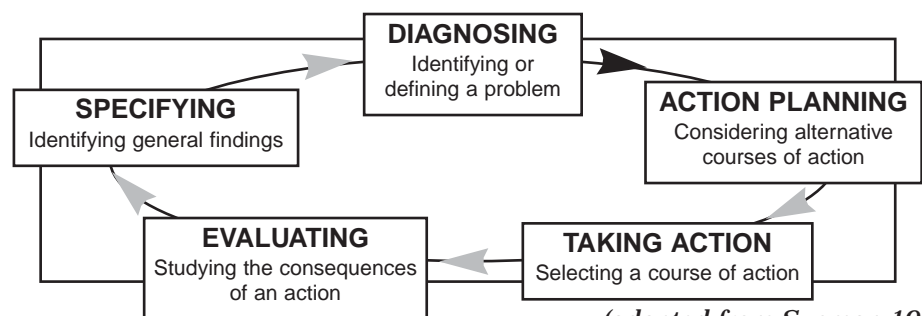
## PARTICIPATORY ACTION RESEARCH

Put simply, action research is “learning by doing” – a group of people identifies a problem, does something to resolve it, sees how successful the efforts were, and, if not satisfied, tries again (Cherry, 1999, p.1). Accumulated research clearly shows that students are not eating healthily. The issue has been clearly identified. By introducing F.U.E.L. (Fluids Used Effectively for Living), students are able to understand some of the problems and ponder some possible solutions. Participatory action research involves both the teachers and the students, and it is recognized that content knowledge is not enough for people to change their attitudes and habits. In this case, the students will learn how to eat healthily using the F.U.E.L. program. The research question is: what factors do students identify as connected to changing their eating habits and adopting healthy eating habits?

*Action research...aims to contribute both to the practical concerns of people in an immediate problematic situation and to further the goals of social science simultaneously. Thus, there is a dual commitment in action research to study a system and concurrently to collaborate with members of the system in changing it in what is together regarded as a desirable direction. Accomplishing this twin goal requires the active collaboration of researcher and client, and thus it stresses the importance of co-learning as a primary aspect of the research process. (Cherry, 1999, p.2)*

The participants in this study became the researchers. As the students were researching, they constructed their own knowledge. Primary among the attributes that separate action research from other types of research is its focus on turning the people involved into researchers, too. People learn best, and they more willingly apply what they have learned, when they do it themselves. Action research also has a social dimension since the research takes place in real-world situations, and aims to solve real problems. Finally, action research is unlike other research paradigms in that the initiating researchers make no attempt to remain objective, but openly acknowledges their biases to the other participants (Cherry, 1999, p.2).

### **ACTION PLANNING LEARNING WHEEL**



*(adapted from Susman 1983)*

Action research is used in real situations, rather than in contrived, experimental studies, since its primary focus is on solving real problems. First, teacher researchers need to learn the theory behind the F.U.E.L. (Fluids Used Effectively for Living) program, then they need to put the theory into practice. Next they need to reflect on that practice by asking the following questions: Is it working? What do I need to do to make this work for me? The answers are used to transform knowledge into making a difference in the lives of high school students.

In order for students to act upon the fact that their populace is in a health crisis, they first must come to understand the crisis through the F.U.E.L. (Fluids Used Effectively for Living) program. The knowledge they derive must then be used to develop praxis. Praxis is a term used by Aristotle to deal with the disciplines and activities predominant in the ethical and political lives of people. The students need to understand the societal and economic processes that are predominant in their lives. For example, they must understand that this health crisis is something that they must take charge of themselves. Aristotle contrasted praxis with theorem, those sciences and activities that are concerned with knowing for its own sake. He contended that both are needed equally. That knowledge is derived from practice, and practice informed by knowledge, in an ongoing process, is a cornerstone of action research (Bencze, 2004, p.1).

Action researchers also reject the notion of researcher neutrality, understanding that the most active researcher is often one who has most at stake in resolving a problematic situation (Keemis, 1993 p.25). Action research in education can be a way to empower teachers and students to take more control over what happens in educational situations.

Action research is not just a technical matter; it is not only concerned with adding to learning. A special feature setting action research apart from other forms of research is that research is conducted at the same time as action is being taken to improve the practices. Consequently, research findings are spontaneous and unique. In other words, because research is conducted as changes are being implemented, new, unforeseen perspectives emerge as the action research proceeds. These perspectives can lead to changes in action, which, in turn, lead to new findings (Cherry, 1999, p.3).

This learning theory suggests that learners learn by changing ideas that are already in their minds. For students to construct knowledge from the facts, they must see a reason to put the facts into their conceptual frameworks. Action research is a vehicle to help students to achieve that result. Action research is a deliberate, solution-oriented investigation that is group or personally owned and conducted. It is characterized by spiraling cycles of problem identification, systematic data collection, reflection, analysis, data-driven action, and, finally, problem redefinition. The linking of the terms “action” and “research” highlights the essential features of this method. It involves trying out ideas in practice as a means of increasing knowledge about and/or improving curriculum, teaching, and learning (Wolfe, 1989, p.1).

In this project, it was expected that participants would share if they are making more healthy choices about their diets and what those choices are. They were interviewed to establish a collective sense of meaning and to determine if they ‘bought into’ the teaching, if the knowledge has transformed their learning, and if they are using that knowledge to create change. “Teachers often leave a mark on their students, but they seldom leave a mark on their profession” (Wolfe, 1989, p.1). Through the process and products of action research, teachers can do both.

# Findings, Presentations, and Analysis of Data

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## DESCRIPTION OF PARTICIPANTS

Students from a grade nine class in a high school in Saskatchewan were asked to participate in a focus group discussion about promoting healthy food and nutrition in school. This high school has approximately fifteen hundred students. There is a student lounge that offers soft drinks, chips and chocolate bars. There is a cafeteria with vending machines that sell soft drinks, bottled water, chips, and chocolate bars. The food served in the cafeteria includes French fries, sandwiches, pizzas, fresh fruits with dip, and vegetables with dip. It also has milk, soft drinks, slushes, fruit beverages or water. Each day of the week the cafeteria offers a special so that students can choose from the following:

- Monday: hamburger and fries or salad and dressing and a soft drink
- Tuesday: hot dogs and fries or salad and dressing and a soft drink
- Wednesday: chicken nuggets and fries or salad and dressing and a soft drink
- Thursday: cheese burger and fries or salad and dressing and a soft drink
- Friday: grilled cheese sandwich and fries or salad and dressing and a soft drink

Grade nine students have the choice of bringing their lunch or buying their lunch from the cafeteria. Within walking distance of the school they have access to a pizza place, a bakery, and a submarine sandwich outlet within a convenience store, and in warmer weather, they can walk to a fast food outlet.

The students in the focus group have come from a variety of schools in the city and surrounding areas. Their socioeconomic status ranges from severe poverty to upper middle class. Some do not have access to enough food and some have an abundance. Most of the middle schools in this city and surrounding area have a 'nutrition program' that supplies the students with education about nutrition as well as a healthy mid-morning snack. In Grade 9, these students are attending high school for the first time. This is the first year that they are solely responsible for making their own nutrition choices. Students who have had some of their nutritional needs met by others during their middle years are now expected, not only to make their own food choices, but to have the resources to do so.

## ANALYSIS OF DATA

For this report, I analyzed all data relating to the focus group discussions, coding and identifying the themes that best describe the participants' experiences during the study. Interpretational analysis is the process of examining case study data closely in order to find constructs, themes and patterns that can be used to describe and explain the phenomenon being studied (Gall, Borg, Gall, 1996, p. 562). All data collected needed to be categorically analyzed into units or segments. These units became segments of text that each contained one unit of information comprehensible even when read outside of the context in which it was embedded (Gall et al., 1996, p.563). Each category may be read as a construct that refers to a certain type of phenomenon mentioned in a data base. A construct is

a concept that is inferred from observed phenomenon (Gall et al., 1996, p.564). Findings were then summarized under specific themes relating to the group discussion questions and presented below. I chose to read the questions and answers and then to summarize the findings in a narrative style.

## SUMMARY OF FINDINGS, PRE-INTERVIEW

At the first recording session, prior to the intervention, students were asked about their perceptions of a healthy person versus an attractive person. A healthy person, in the eyes of the focus group, is indicated by a few characteristics: weight (not overweight or underweight), complexion, not looking sick, good teeth, and athleticism. The students said that a healthy person looks fit, is active, has a good complexion (i.e., is not pale, but has rosy or peachy cheeks), is not sick, has white teeth, watches what he or she eats, and may be athletic.

The students indicated that an attractive person is not necessarily healthy, but could be. Physical appearances differ and are often affected by weight, being too skinny or too overweight. What is attractive in people differs from one person to another, but most students said that appearance was a factor in attractiveness. A typical comment from the students was: "An attractive person is skinny, has a perfect body and perfect hair."

About one third of the teenagers in this focus group discussion indicated that they would choose to be healthy; one-third would choose to be attractive rather than healthy; and the rest of the students wanted to be or date someone who was both attractive and healthy. Two responses mentioned weight. One student's justification for choosing to be healthy or attractive was essentially a health issue (she can die or I will get sick). Another health issue was mentioned by the students in statements that they would not take drugs. Although responses differed, the typical response involved: an attractive person is healthy, sometimes they are healthy. Looking good was an issue in most of the answers.

When asked what they could do to make their own lives healthier, they all chose eating and exercising properly as options. Most students talked about making more positive food choices. Some said that they should drink properly, eat healthier foods, eat breakfast, and increase vegetable consumption. Others said that they needed to 'cut out' certain foods, such as junk food, popcorn, chips, pop, burgers, candy, coke, and fattening foods, and stop watching so much television. Most would increase their exercise by playing sports, running or walking to school, doing push ups and sit ups, working out, going to the gym, and swimming. The responses reflected dissatisfaction with what they were doing to become healthy, but the solutions proved to be vague and have an 'all or nothing' message. Only one person was satisfied with what (s)he ate and the amount of exercise (s)he did.

Their suggestions for encouraging healthy eating included talking to students, making posters, having contests, writing a column in the newspaper, providing nutrition education, and starting a health club for students to engage in physical activity. The majority of students stated that they needed to take the message to others personally, either by talking to someone, providing an example, or speaking through the written word or presentations. Concern was expressed about the food offered in the school cafeteria.

## SUMMARY OF FINDINGS, POST-INTERVIEW 1

The second focus group discussion took place three weeks after teaching F.U.E.L. (Fluids Used Effectively for Living). Most students indicated that the information provided in the program had helped them to make significant changes in their food choices. Only one person indicated that since he/she was eating healthily and exercising before, no specific change had occurred. Discussion showed that the students had changed their own eating habits, including drinking more water and decreasing salt consumption. They were more aware of the amount of fat, sugar and salt in foods, so adjusted their eating habits accordingly. They also started reading nutritional labels to identify what they were eating so they could make healthy choices. Participants in the study indicated that the information presented about adding fruits and vegetables, drinking water, reading labels, eating less junk food, knowing what to eat, and exercising had helped them to make the changes to their everyday lives.

Participants were also asked: How can you get other students to buy into this program? What actions need to be taken in the school so that all students will care more about their health and can make appropriate choices? These questions were designed to encourage the students to take the knowledge a step further by asking them to identify what needs to be changed and what they could do about it. A variety of responses were given that mentioned posters, menus in the cafeteria, bringing healthier lunches from home, and further education about nutrition. Some students advised the school to change its cafeteria menus and sell healthy food that tastes better than junk food. Participants also advised that other students be told about eating healthy so they, too, could make positive lifestyle choices.

Participants advocated both personal and corporate education. Some believed that if healthier food was delivered in the cafeteria, students would approve of the change. They even advocated a price cut for healthy foods versus expensive, unhealthy foods in the belief that price might determine what students ate. One group of participants advocated the removal from the school of all carbonated drinks and fruit beverages. Their ideas incorporated the notion of Canada Health that affordable nutritious food is a basic right of every student.

## SUMMARY OF FINDINGS POST-INTERVIEW 2

In the third focus group discussion, which occurred three months following the intervention, participants were asked what action they had taken to become healthier. This question was met with a very positive response from the students. Most said that they had done something to improve their health. The exceptions were two of the students who were happy with the meals they ate and the exercise they did. A significant number of participants increased the amount of fruits and vegetables in their diet. Eating in moderation was a theme that emerged, as was looking at nutrition labels. Increasing the amount of water consumed was mentioned a number of times. Some of the participants had increased their level of physical activity, some indicated they had decreased the size of their portions, and some of the students had switched what they were eating. For example, they were now eating wraps and vegetables instead of burgers and fries; they were also cutting back on the amount of pop they drank, replacing it with water or milk; and some brought their own lunches instead of eating food from the cafeteria.

Participants were asked: what action did your class take in the school to encourage other students to become healthier? More than half the students suggested that they were doing or thinking of doing something about eating healthily in school. Some indicated that they were already talking to their family and friends, and some were going to talk to them. One participant had taken the lead to develop a petition asking the school staff to offer healthy food choices in the cafeteria.

When asked about taking the lead in their communities, some participants felt that they did not have the skills to become community 'leaders', but they saw no difficulty in talking to their peers, parents and teachers about eating healthily. Participants also started a petition and took their concerns about promoting a healthy school nutritional environment to the vice principal.

The final question to students asked what they would do to increase their own level of health. A majority of students said they would continue to change the way they were eating. Only seven students out of the thirty surveyed did not change anything. Nine students said they would change their exercise habits, and thirteen wanted to change their eating habits. Overall, the student response to the intervention was positive.

# Discussion, Implementations and Recommendations

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## DISCUSSION AND IMPLEMENTATIONS

My question was: If we give knowledge to students, would they take that knowledge and make changes? The students' comments in the focus groups indicated that almost all of the students internalized the knowledge given to them. They took the knowledge and applied it to their own lives. They also talked to parents, siblings and peers about what they were learning. Some even took that knowledge and used it to make social change. By making knowledge meaningful in their lives, those students gained a passion for something they came to believe in.

Research has shown that learning tasks situated in some meaningful real world task or simulated in some case-based or problem-based learning environment are not only better understood, but also are more consistently transferred to new situations. By asking the students to take this real world problem (students are not eating healthy), and to develop solutions on their own, teachers and nutritionists taught knowledge and skills in a real life situation, and provided a different setting for learners to practice using those ideas.

Learning in this way was a social, dialogical process. Students learned to seek out opinions and ideas from others. This interaction was evident when students were answering group questions – they fed off what others were saying, repeated or added their own views, and thought of multiple perspectives and sought multiple solutions to bring to bear the information. They learned to work with others, they learned to feed off the ideas of others, and they also learned their own strengths and worth.

Learners were required to articulate what they were doing, the decisions they made, the strategies they used, and the answers that they found. They had a chance to do that by making recommendations to other students, parents and peers. When they articulated what they had learned and reflected on the processes and decisions that were entailed by the action research process, they appeared to learn to use the knowledge that they had constructed in new situations.

These lessons engaged the students intellectually, physically, and emotionally. By asking students to translate their health and well-being into taking responsibility for their own actions, students did take positive actions to become or remain healthy. The majority of these students chose to change something in their lives to become healthier. A large majority chose to both change their eating habits and add more exercise to their lives.

This study found that knowledge and working with that knowledge made a difference in each of the students' lives. It either gave them with new information, or it reinforced the information that they already had. Most students made the commitment to become healthier. One group of students developed a petition asking for healthier food in the cafeteria, having decided that the food offered was not healthy. This decision continued to surface in all the data. They indicated that they were not only making corporate decisions to deal with unhealthy food in the

school, but were also making personal decisions to be healthy. One student has started to eat healthily and exercise, has lost weight, and is committed to continuing healthy lifestyle choices.

The implication is that students are willing to learn about eating healthy. They are willing to incorporate healthy eating into their lifestyles. They need to be made aware of their options and educated with facts that show what healthy eating is and how they can improve their own health. The education process has to be made personal and it has to be relevant. Students need to know that healthy choices are there for all students so they will not only increase their health, but be instrumental in educating others about healthy choices. As one of the students commented: "I will try to keep helping others like my little sister to quit eating so much candy."

## RECOMMENDATIONS

### STUDENTS

1. Make small changes and work with those changes until they become habit. For example, if you want to increase the amount of vegetables you eat, start by adding one vegetable serving to lunch and continue until it becomes a habit. Then move on to other changes.
2. Use food as fuel for your body. Food has no power over you. The intention of eating is to fuel your body. Do not give 'food' psychological power. It is only food. It does not have the power to soothe, make you feel better or make you feel worse. Remember it is only fuel.
3. Take charge of your own well being. If you eat sufficient amounts of the right food to sustain your body, then your body will respond by working the way it is suppose to. Eating well and feeling well go hand in hand. If you eat well and exercise, you will be the best person you can be. (Keep track of how you feel when you are eating well and how you feel if you do not eat well).
4. Experiment with different tastes. By eating deep fried, heavily salted foods, or sugared foods, your taste buds develop a taste for only those foods. They also develop a craving for those foods. It may take three days to overcome those cravings, but the long-range benefits of doing so outweigh the cravings.
5. Continue to advocate the 'best' for yourselves and others.
6. Each time you talk about making healthy choices or do not participate in unhealthy eating habits, look after yourselves. You are making a statement and you are leaders.

### TEACHERS, PRINCIPALS AND SUPPORT STAFF

1. Members of school staffs need to take care of themselves. They need to take care of their bodies so they can function at our best. Positive role-modeling of healthy eating by school staffs will encourage students to follow. Training teachers about nutrition can positively affect their nutrition behaviours and help them be positive role models for students.
2. Schools need to promote nutritional education for every student.

3. Students are being bombarded with commercials that promote unhealthy alternatives. Schools need to teach them what the media is trying to sell them so they can be informed consumers.
4. Schools need to advocate healthy foods for students. School staffs need to be informed about the decisions being made on what is sold in our schools. They need to support efforts to promote health. By providing students with resources, suggestions, and strategies to improve their nutritional status, they can help students explore and understand that healthy eating patterns are essential. Students learn better and are less distracted when they are healthy. For them to achieve their full academic potential and full physical and mental growth for lifelong health and well-being, they need healthy food. School staffs need to promote the availability of healthy, reasonably priced food choices in school.
5. Teachers, through their professional organization, should support 'healthy foods' for students. It needs to be recognized as a 'right' for every child in our education system to have access to healthy food. The Saskatchewan Teachers' Federation should develop a food and nutrition policy to support healthy eating.
6. Students need to be seen as part of the solution; they must be involved in the decision-making and direction-setting for change to take place.

## SCHOOL BOARDS

*Most children lack the skills to consider the long term consequences of their actions. As a society, there are laws and regulations, such as those covering school attendance, use of tobacco and alcohol, and use of bike helmets, that protect children because of their inability to make good decisions regarding their long and short term health needs. It is incumbent upon the school system to foster healthy eating habits and to protect students from those who profit from children's growing consumption of foods with minimum nutritional value. (Center for Science in the Public Interest).*

1. Boards should acknowledge that the current school nutrition environment at the secondary level is a public health issue requiring urgent action.
2. A commitment is needed to the essential elements of a healthy school nutritional environment.
3. Board should create and promote consistent messages about the value of healthy school nutrition.
4. Mandatory food standards should be implemented for all high schools.
5. It needs to be acknowledged that it is a 'right' for every child in our education system to have access to healthy food. A food and nutrition policy to support healthy eating is necessary.
6. These nutritional standards need financial backing.

*Schools should be safe havens where students can access healthy food away from the unrestricted market place with its intense marketing and ready availability of foods with minimum nutritional value. (National Consensus Panel on School Nutrition, 2002)*

## SUGGESTIONS FOR FURTHER STUDY

To make this a study that truly involves social action research, more time is needed. It would be interesting to track the students who participated to see what happened when they presented their petition. It would be fascinating to see if they concluded that a petition was the proper route for them to take or if they needed to take a different route to achieve the results they seek. It would be interesting to see if they felt thwarted or if they continued to believe this was an action worth pursuing. It also would have been valuable to continue studying these students as they finished high school to see if the nutrition recommendations became a part of their lives.

Any continuation of this study could be done omitting the word 'leaders'. Students seemed to be confused by this word. They had become leaders by talking to peers, parents, teachers and others, but they did not perceive this to be the case because they thought that leaders needed to have a position of power.

Changes come from the individual actions of consumers who do not purchase products. An interesting continuation of this study could involve 'consumer reports'. Students are also unaware of the power of grassroots organizations and the power of the collective.

A study involving students from different schools would prove beneficial in determining whether or not the results of this study would be repeated elsewhere. It would also be interesting to track the changes in a school where deep-fried foods have been replaced with healthier alternatives. Tracking students in such a school would provide valuable data to substantiate these findings.

## CONCLUDING REMARKS

A concerted effort is needed to make nutrition a priority for education systems and lead to change. Teachers, students, parents, administrators and school boards need to be educated so they understand the positive effects of healthy eating before this research represents more than a single study at a point in time. It takes people with a vision and a focus toward a common goal to proactively deliver a program of healthy alternatives. I believe such a program is a worthwhile venture.

It was a pleasure to work with dedicated teachers and students who enjoy learning and teaching. It is an exciting adventure to tap into the potential of knowledge that can be gleaned from an existing base. In the future I would recommend that students take part in any health-related changes that are made in a high school setting. Before we ask for their input, however, they need to be well educated about the changes. In this way, we are not only teaching them about healthy eating, but we are also teaching those young people that their voices and opinions are important. These students will be asked to make choices in the future, and perhaps they will have learned that their choices make a difference. We also teach those adolescents that they are responsible for their own choices, not only with respect to their health, but also with respect to their lives. A student response dictates the passion in action research:

*We are going to change the ways students eat around this school.*

## MY REFLECTIONS ON THE PROJECT

There is a group of people who promote the idea that students need to have a choice of foods at schools. These people would say that it is not our responsibility to dictate what students can or cannot eat. They promote choice, saying that education alone is enough to have students choose healthy food. They argue that students need to make informed decisions. I disagree. I believe that we, as teachers, school board members and educational administrators, need to be role models for our students. As a chef, I know healthy food tastes good. I believe that students have a right to only healthy food choices in high school as well as in elementary school. I believe that students' health needs are as important in high school as they are in elementary school. In elementary school we ban soft drinks and assure students of breakfasts and healthy snacks. Why do we stop these healthy practices in high school when student bodies are growing at their fastest rate? As a teacher and a mother, I believe that the health of students at a school is our business and we need to advocate for our children to have access to healthy foods at a fair price. Students learn better, act better, and feel better if they eat healthy food.

It is my hope that this project has a positive influence on the health of our students. I believe that by getting students involved, a change can be made. Students' advocacy, along with support from educational stakeholders, is the key to student participation in coming to understand the issues. Student participation is the key to making change and adopting healthy lifestyles. There are many people trying to promote healthy foods in our schools. There are many people serving healthy food in schools and there are many people who are fighting for student health. I hope that this study will encourage and assist those people. The next generation depends on it.

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# Appendices

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## APPENDIX 1: OVERVIEW OF F.U.E.L. (FOODS USED EFFECTIVELY FOR HEALTHY LIVING)

**Project Title:** F.U.E.L. (Foods Used Effectively for Healthy Living) Promoting Healthy Food and Nutrition Choices among Rural High School Children

**Introduction:** There are many reasons to be concerned about nutrient intakes of children, as it is now known that many chronic diseases have their beginnings in childhood. The prevalence of obesity among children and adolescents has doubled over the last several decades in developed countries and in populations undergoing cultural transitions such as those from Aboriginal communities. Sugary beverages such as soft drinks and fruit punches, ice tea and sports drinks, are all low nutrient dense and either add unneeded energy to the diet or replace more nutritious beverages such as milk in the diet of adolescents.

**Purpose:** This study sought to evaluate the effects of a foods and nutrition program in promoting healthy eating behaviors among rural adolescents.

**Objectives:** The objectives were: to assess knowledge, attitude and behaviors towards healthy food and nutrition choices among grade nine rural students in Saskatchewan; to evaluate the effectiveness of an expanded foods and nutrition program in promoting healthy behaviors; to test the hypothesis that an expanded foods and nutrition program will encourage changes in attitudes and behaviors among rural adolescents; and to evaluate the intervention and make recommendations for its use in other schools across Canada.

**Method:** The grade 9 students studied came from two classes in Prince Albert, received an expanded FUEL program, taught by a dietitian. The program featured a collaborative constructivist approach to teaching and learning. A self-administered questionnaire collected data on knowledge, attitude, and behavior before and after the foods and nutrition intervention. The class labeled comparison received a teacher assisted curriculum. We also had the opportunity to test a FUEL in a fifth class composed primarily of children from First Nations communities in Prince Albert. The experiences of participants (students and teachers) were also evaluated qualitatively. The study was intended to provide a forum for students to understand the problems of healthy eating behaviors. Focus groups of students were invited to participate in discussions about promoting healthy food and nutrition in school, at baseline, and following interventions. Students in the Aboriginal class were encouraged to write their thoughts in the questionnaire, a strategy that gained information while also helping with classroom management. Data analysis the development of themes from the focus group discussions.

**Results:** Baseline data gathered from all three classes showed similar negative relationships between consumption of healthy beverages such as milk, with sugary beverages. Pre-test-post-test evaluation design suggests that students in all three classes indicated changes in knowledge, attitudes and healthy beverage

behaviors from baseline to the post-intervention among all participating students, with significant gains among participants from the dietician-taught approach.

The study was part of the principal investigator's MEd project. From personal observation, she saw students eating unhealthily before and after class. A copy of the report is attached. Findings from this study have been disseminated to several conferences and conference proceedings. A manuscript is also in preparation. The resource, *F.U.E.L. for Your Future: Fluids Used Effectively for Living*, has been reviewed by the Department of Learning and has been recommended for use in Saskatchewan classrooms in the following subject areas:

- **Health Education - Grade 7 - Unit: Healthy Eating**
- **Wellness 10 - Grade 10 - Unit: Healthy Eating**
- **Food Studies 10, 30 - Grade 10 & 12 - Unit: Food and Nutrition**

Findings will also be important to planners, educators and others interested in the dietary behaviors of high school children.





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