

ENVIRONMENTAL EDUCATION FROM FOOD: RESEARCH ON FOOD KNOWLEDGE AND EATING BEHAVIOR

Ming-Chun Lai
WuFeng University, Taiwan
mclai@wfu.edu.tw

Hsiang-Yung Feng
National United University, Taiwan
hyfeng@nuu.edu.tw

Abstract:

In recent years, the importance of environmental education has more attention as before. The 100-mile diet concept has reduced carbon emissions and is good for environment. This study is an exploratory research and to introduce the concept to students and test their environment cognitive and behaviour. There are 51 students complete questionnaire, 28 males and 23 females. The results indicate that almost college students hold higher food knowledge but lower eating behaviour. However, the results also show that there are no statistical relevance between "food knowledge" (cognitive or belief of food) and "eating behaviour "(behaviour of food). It means that environmental education must change the current teaching methods and be found in daily life and food education.

Keywords: environmental education, food education, food knowledge, eating behaviour

1. INTRODUCTION

Energy shortages, greenhouse effect, climate change and other environmental problems in recent years make sustainable development, carbon reduction and other global issues become the more concern of the world. Environmental education is to help people reflect on these issues surrounding environmental pollution hazards, energy crisis, disappearance of species, the relationship of human and nature. Meanwhile, environmental education is to seek solutions of sustainable development and life quality. The importance of environmental education has more attention as before in education sector.

A book "The 100-Mile Diet: A Year of Local Eating" written by Canadian writers Alisa Smith and J.B. MacKinnon was covered by media and caused a lot of repercussions. In the book, the authors recount their experiences, including motivations and challenges, on restricting their diet to include only foods grown within 100 miles of their residence. While the concept of only eating locally grown food is not new, the book coincided with the emerging popularity of the locavore movement and farmer's markets. The 100-mile diet concept, along with advocates of local food, has reduced carbon emissions and is good for environment. It let people realize that diet can reduce the greenhouse effect, and also promote the sustainable development of environment. The purpose of this study is to investigate the food education within environmental education, teaching students to care the environment from daily diet.

2. LITERATURE REVIEW

2.1. Background of Environmental Education

After the World War II (1939-1945), the industrial production increased, but environmental disasters occurred frequently with industrialization. Such as air pollution, water and soil pollution, radioactive waste and other toxic substances destruction, they made environment problems increasingly serious. Technology was no longer a panacea to solve all problems, it was a key that a new academic discipline - environmental education rise in the late 1960s (Chou, 1988). For this reason governments of the world had invested international organizations, combined technical and academic professionals to seek the common solutions. The promotion of environmental education which upholds the purpose of education in changing human thought and behaviour was the important method to remedy people's values deviation and destruction behaviour of the natural environment. Just as Palmer (1998) said that environmental education is a product of human increasing concern their surroundings.

Environmental movement began in the late 1960s, and environmental education has the important milestone in the 1970s. Many governments of the world had enacted environmental laws, and trained professional engineers to solve environmental problems. In addition, Environmental Education made citizen awareness of environmental pollution and improved environmental problems by technology.

Compared to countries in the world, Taiwan's environmental education started late. 14. Yang(2002) pointed out that there is "environmental health" but no "environmental protection" in government administration before the 1970s. The concept of environmental education in education Sector was until after 1982 and fulfilled in 1987 when Environmental Protection Department (EPD) established. The rise of environmental education was a new field of education. The rapid development of environmental education has caused great concern all over the world of academics and the public-private sectors.

2.2. Environmental Education and Research Trends

The early stages of environmental education around 1970s-1980s, teachers or researchers were in the field of natural sciences. They might be professional backgrounds and more affected by empirical doctrine scientific (Fensham, 1978; Lucas, 1979; Stapp, Caduto, Mann, & Nowail, 1980). These studies were mostly quantitative research paradigm and belonging to the natural sciences. Until the 1990s quantitative research was still a considerable amount, but the research methods were gradually becoming diverse, research on the topic of social science had become a hot focus.

Since the 1990s, under the social change and international situation, new and diverse environmental issues were affecting the teaching and studying of environmental education. Hsin et al (2011) pointed out the research topics generally trend in this period focused on: (i) The implementation of environmental education in the curriculum and teaching methods; (ii) Influence between the ethical values of environmental education and the political, cultural, economic; (iii) Environmental regulations and policies; (iv) Global environmental conservation and ecological issues; and (v) Sustainable development.

With the dawn of the twenty-first century, globalization makes people combine within the environment, technological, economic, and social issues. Environmental education and study have many social science issues to be the needs of real life, and have a global view of the world care (Fuller, 2000; Carter, 2008). Lui (2010) noted that globalization makes Taiwan have to follow the other advanced countries in the practice of environmental education. Such as Germany, it had the strategy to be a low-carbon society. It must be actively to promote the construction of low-carbon community, and estimated to be 50 to achieve a low-carbon community in 2011. By the steps it constructs the low-carbon city and low-carbon living area.

2.3. Food Education and Related Research

"Food Education" (syokuiku), the term was first used by the Japanese health experts Sagen Ishizuka in 1896 book "The longevity dietary of chemical theory" and 1898 book "Popular food regimen". Ishizuka stressed that all of physical, intellectual, and talent education are food education." Ishizuka noted regardless of where they should eat local land out of crop or seed production of agricultural products. Since these crops locally produced, on behalf of the local environment is suitable for the cultivation of this crop, but it is a staple in the most natural and healthy (Tseng et al, 2012). The concept of Ishizuka is an act of intimate environment.

From the "food education" concept Ishizuka left mysterious and basic rationale Japanese "food education of the Basic Law" point of view, food sterile spirit should include food knowledge and eating behaviour; that is the theory of reasoned action noted: behavioural change will be the first to change a person's perception and beliefs. Food education students must first food knowledge (cognitive or belief) begin to change the behaviour of the students' diet (behaviour). Food and knowledge should include food (wood) sources and nutrition knowledge; while eating behaviour should contain carbon reduction concepts to real estate sales, as well as the implementation of the concept of balanced diet behaviour. However, in the past our diets promote education and nutrition knowledge was limited to a balanced diet, completely food sources, environmental energy saving concepts to real estate sales, and threw environmental education, ignoring the seasonal diet should meet the health and environmental concepts.

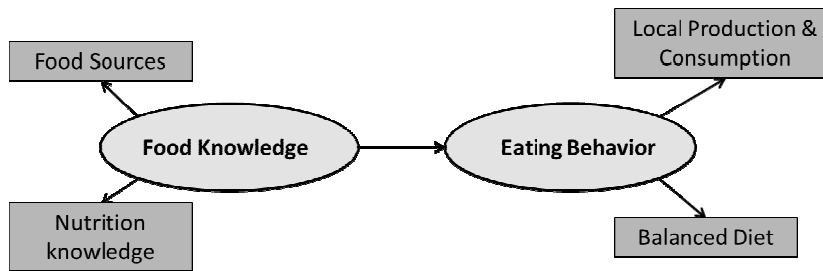
There are only 2 papers about food education found in Chinese Electronic Periodical Services. Chang & Yen (2011) wanted to construct the index of sustainable food for rural community, but not to discuss how to get residents to accept the conditions. Tseng et al (2012) made force on improving students' food knowledge by agricultural experience activities. Their paper did not probe the relationship between cognitive and behaviour of food, and did not illustrate the contribution of food to environmental education.

3. RESEARCH METHOD

3.1. Research Framework and Hypotheses

This study is an exploratory research to comprehend the position of food education within environmental education. Based on literature reviews and the objective of this study, research framework shows the relationships between food knowledge and eating behaviour of university students (Picture 1). In this study, food knowledge includes two parts food sources and nutrition knowledge. The test consists of 5 items both food sources and nutrition knowledge. It is to test students whether know the content of food. On the other way, eating behaviour is expressed by local production-consumption and balanced diet. The two variables use 5-point Likert scale ranging from 1 (not at all true of me) to 5 (very true of me). However, a research hypothesis has been developed based on the relationships identified in the previous section: There are some relationships between food knowledge and eating behaviour of university students.

Picture 1: Research Framework



3.2. Sampling and Data Analysis

The research sample is author’s classrooms in National United University of Taiwan. The 51 students, all are four years undergraduate system and have different majors. However, the material analysis is by counts software SPSS for the Windows version to take the statistical analysis tool. The questionnaire material and passes through first carries on the Cronbach’s α validation test, in “Local Production & Consumption” and “Balanced Diet”, α value is bigger than 0.7; The reliability also achieves 0.728 and 0.839. Reliability analysis confirms the reliability and validity of variables adopted in this study.

Descriptive statistics is used in most of the data analysis. In order to clarify the relative contribution of these variables, a correlation analysis is also used. The most familiar measure of dependence between two quantities is the Pearson’s correlation coefficient, which is also referred to as linear or product-moment correlation. Correlation coefficient is a term that refers to the strength of a relationship between two variables. A strong, or high, correlation means that two or more variables have a strong relationship with each other while a weak, or low, correlation means that the variables are hardly related. Correlations are useful because they can indicate a predictive relationship that can be exploited in practice.

4. ANALYSIS AND RESULTS

4.1. Sample Descriptive

The subjects who take part in this study are 55 students after ignored 4 students’ incomplete questionnaire. There are 28 males (54.9%) and 23 females (45.1%). The demographic profile data of respond students showed table 1. As for dining habits, both in-campus cafeteria and off-campus restaurant is mainly habit. There are 23 students, 45.1% of the total number. Mainly off-campus restaurant or in-campus cafeteria total are up to 41.2%. It shows that mostly college students are living away from home, so the dining habits are in-campus cafeteria or off-campus restaurant. In the habit of eating breakfast, the data shows that all of students have good eating habits. There is no one to neglect breakfast for sleep or other things. In addition, body type and the state of health, the large part of students consider themselves are average or ordinary.

Table 1: Demographics of Participants (N=51)

Demographics		Frequency	Percentage
Gender	Male	28	54.9%
	Female	23	45.1%
Eating habits	Mainly in-campus cafeteria	5	9.8%
	Both cafeteria and restaurant	23	45.1%
	Mainly off-campus restaurant	16	31.4%
	Often at home cooking	7	13.7%
Breakfast habits	Every day	28	54.9%
	Often	15	29.4%
	Occasionally	8	15.7%
	Never to eat	0	0.0%
Body type	Thin	13	25.5%
	Average	27	52.9%
	Fat	11	21.6%
State of health	Good	16	31.4%
	Ordinary	28	54.9%
	Not good	7	13.7%

4.2. Descriptive Statistical Analysis

Food knowledge divided to food sources and nutrition knowledge, in the measurement, we take five multiple-choice questions to calculate the students' score. So, the maximum score is 5 points and minimum is 0 points. The statistics outcome shows that the means of food sources and nutrition knowledge are 3.21, 3.81; the standard deviations are 1.099 and 1.185. However, eating behaviour divided to local production & consumption and balanced diet, we take 5-point Likert scale questionnaire to test the students' behavioural tendencies. The statistics outcome shows that the means of local production & consumption and balanced diet are 3.39, 3.45; the standard deviations are 0.882 and 1.050 (see table 2 below). Further, test the difference between two means of food knowledge and eating behaviour, it gets t-value 7.688 and has statistical difference. The results indicate that almost college students hold higher food knowledge but lower eating behaviour. That is, there are differences on food cognition and behaviour.

Table 2: Summary of Measurement Scales

Variable	Item	Mean	S.D.
Food Knowledge	Food Sources	3.21	1.099
	Nutrition Knowledge	3.81	1.185
Eating Behavior	Local Production & Consumption	3.39	0.882
	Balanced Diet	3.45	1.050

4.3. Correlation Analysis

The purpose of this study is to investigate the relevance of college student's food knowledge and eating behaviour, as a preliminary study to food education. In this study, canonical correlation analysis is used to analyse "food knowledge" and "eating behaviour". Table 3 shows the correlation coefficient matrix between food knowledge and eating behaviour. The statistical results indicate that a correlation coefficient of "nutrition knowledge" and "food source" is 0.526 and has reached a significant level. Further, the correlation coefficient of "local production & consumption" and "balanced diet" is 0.628 and has reached a significant level (see table 3). Instead, these correlation coefficients between the two indicators of "food knowledge" and the two indicators of "eating behaviour" are positive but no statistical significance. The results show that there are no statistical relevance between "food knowledge" (cognitive or belief of food) and "eating behaviour" (behaviour of food).

Table 3: Correlation Matrix between Food Knowledge and Eating Behaviour

Variable		Food Knowledge		Eating Behaviour	
		Food Sources	Nutrition Knowledge	Local Production & Consumption	Balanced Diet
Food Knowledge	Food Sources	1	0.526***	0.107	0.243
	Nutrition Knowledge	0.526***	1	0.079	0.258
Eating Behavior	Local Production & Consumption	0.107	0.079	1	0.628***
	Balanced Diet	0.243	0.258	0.628***	1

*p<0.1, **p<0.05, ***p<0.01

5. CONCLUSION AND SUGGESTION

A few years ago, former U.S. Vice President Al Gore shot documentary "An Inconvenient Truth", which evidence and made a number of global warming information. The film shocked the world with emphasis on global warming issues. It also won two Academy Awards, and let Gore be regarded as the most international figures in promoting environmental protection. However, Gore was exposed that his own family gas and electricity fee was amazing high, even up to \$ 30,000 a year, so environmentalists criticized that he is a hypocrite.

In fact, many scientists continue research efforts under the UN Panel on Climate Change has also been cross-published evaluation report noted that emissions of carbon dioxide and other global warming and human activities have a high correlation. Thus, it has no relation to the concept of global warming, but the fact that iron. Emphasis on "environmental sustainability", strengthen energy conservation and carbon reduction, the development of clean energy, green industry, etc. expand environmental education and measures have long been the government, education, industry, and even the people should pay attention to the issue. However, with changes in lifestyle and consumption of material, such as former U.S. Vice President Al Gore so, support for environmental protection, with environmental awareness, but it cannot be implemented in their lifestyles in everyday life, and everywhere.

Europe and the United States not only attach importance to environmental education and the impact of global warming caused by carbon dioxide emissions will also be eating moral education into the national intellectual a ring, but will eat sterile and nutrition and health, the environment and sustainable combination of physical and mental health and the promotion of the national wealth of humanity develop. Implementation of food from eating behaviour hundred miles, carbon reduction, environmental conservation goals by taste buds to save the earth , dietary education of college students is very important key, because these students will graduate to become a member of society independent , whether married or employment, are is with the actual behaviour of economic agents. The results of this study found that students' cognitive of nutritional knowledge is higher than of the food sources of knowledge. There is no difference between "food knowledge" and "eating behaviour" of different students' background. This result seems to indicate that the current domestic dietary education or environmental education, you cannot become a part of students' knowledge beliefs of everyday life, but also cannot be linked to carbon reduction concept of environmental conservation and food sources of local sales, only students experience cooking, will pay more attention to the food source of the problem and the real estate to the pin. Environmental education should pay more attention to the teachings of the daily diet, behaviour, in order to achieve the purpose of environmental education.

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