A study of the effects of the Food and Fiber Literacy project on participating teachers
by Darren Paul Crawford

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Agricultural Education
Montana State University
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Abstract:
This project was a quasi-experimental study to evaluate the effects of the Food and Fiber Literacy Project on the participating teachers and their respective schools. A one-group, pretest-posttest design was used (Gall, Borg & Gall, 1996) The population consisted of the teachers who voluntarily participated in the Food and Fiber Systems Literacy project at selected test schools in Townsend, Montana; Woodland, California; and Yale, Oklahoma.

Responses to the items in the instrument were entered into a Microsoft Excel spreadsheet, then analyzed using SPSS 7.5 for Windows ®. Means and standard deviations were calculated for each question in the instruments. T-tests were done to search for significant differences between pretest and posttest responses to individual questions and responses in the five concept areas. A one-way Analysis of Variance (ANOVA) was performed in each of the five categories to find any significant differences among the three schools in pretest and posttest responses.

Focus group interviews were conducted to gain insights into teachers’ attitudes, perceptions, feelings and beliefs about the effectiveness of the project and the quality and usability of the resources and materials used in the Food and Fiber Systems Literacy project (University of Texas, Houston, 1996).

Data analysis revealed that the Food and Fiber project did affect their attitudes and perceptions about agriculture.

Responses to the focus group interview questions showed an increased awareness of agriculture and the food and fiber industry in their communities. Teachers also expressed an increase in class participation on the part of the students. Students were making more real life connections to their schoolwork and appeared to be retaining more information after the lessons. Teachers were using more technology and resources within their community as a result of the Food and Fiber Literacy project. Most participants in the project agreed that materials and lessons associated with the Food and Fiber Literacy project were very usable and the concepts were easily integrated and combined with existing curriculum.

The Food and Fiber Systems Literacy Framework would be an excellent model for other agricultural literacy programs to help effectively integrate food and fiber concepts into the curriculum. It could also be used to help states meet curriculum integration goals.
A STUDY OF THE EFFECTS OF THE FOOD AND FIBER LITERACY PROJECT ON PARTICIPATING TEACHERS

by

Darren Paul Crawford

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Agricultural Education

Montana State University-Bozeman
Bozeman, Montana
December 1998
APPROVAL

Of a thesis submitted by

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This thesis has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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CHAPTER ONE

THE PROBLEM

Introduction

As we approach the 21st century, we must evaluate the agricultural knowledge of our nation's population. America started out as a nation based on agriculture, but for over 40 years, ninety percent of the population has not been directly connected to production of food and fiber (Douglass, 1985). Agriculture, which relates to any sector of the industry supplying farm inputs or engaging in the production, processing, or distribution of agricultural products, is still the world's largest and most essential industry (University of California, Davis; Milton Hershey School, 1996). The food and fiber system affects everyone the world over. We all consume its products, in the food we eat to the clothes we wear to the houses in which we live. America has relied on the food and fiber system to provide us with the most abundant, least expensive supply of food in the world. We have done so with fewer and fewer members of society involved in the direct production of food and fiber (Birkenholz, Harris & Pry, 1994).

Even though fewer and fewer Americans are involved in the production of food and fiber, an increasing number are very concerned with what they perceive as inappropriate practices in the production of food and fiber (National Agriculture Research and Extension Users Advisory Board, 1991). According to Erwin (1993, p. 66-67),
within the Environmental Protection Agency “many fine, conscientious government employees were writing regulations for farmers while they themselves did not understand agriculture.” With an increased interest in developing policies related to the environment and the use of land, water, fertilizer and fossil fuels (Brown & Kane, 1994), we need to find people in positions of power who are literate about our food and fiber system. The American public also needs to understand the basic concepts of agriculture. Even though we live in a nation with the lowest per capita food cost in the world, much of the general public is unaware of where and how their food is produced (National Resource Council, 1988). With advancements in agriculture, many people are now able to pursue careers that are removed from agriculture. With this trend, fewer and fewer people are directly connected with the production of agricultural products that they use everyday. According to Thompson (1986, p.1), if we allow our citizens to “…remain ignorant of basic facts about food, agriculture and natural resource systems, the activities of agricultural colleges will increasingly be perceived as serving only the interests of a narrow constituency.” The effects of this on society today and in the future will be very serious. Those who will be making influential decisions will not understand the significance of our food and fiber system on our society (Frick, 1990). Society will benefit by teaching our children about agriculture at a young age.

The National Research Council (1988) reported that agriculture is only being taught in secondary vocational agriculture courses, and is not being taught in the elementary schools of this nation. With the small number of students who take agricultural education courses, it is difficult to see how this problem will get any better.
The National Research Council (1988) suggested that all students needed to receive instruction about agriculture beginning in kindergarten and continuing through the twelfth grade. The National Research Council also suggested that integrating agriculture into existing subjects and curriculum would be more effective than creating a separate area of study.

**Purpose of the Study**

The purpose of this study was to determine the change in attitudes toward the food and fiber system and toward the implementation of the Food and Fiber Systems Literacy Framework in the test schools in Woodland, California; Yale, Oklahoma; and Townsend, Montana. Results are based on teacher responses to a 40-item survey instrument, and focus group interviews conducted at schools participating in the Food and Fiber Literacy project.

**Need for the Study**

Fishbein and Ajzen (1975) stated that people tend to rely on their own knowledge, observations and personal experiences to make decisions. Osborne and Dyer (1996) related this statement to agriculture by saying, “Knowledge of students’ attitudes toward agriculture will, theoretically, provide an indication of their interests in pursuing agriculture as a field of study and professional pursuit” (p. 252). Terry, Herring & Larke (1992) found that student teachers in elementary education who had more
background and knowledge about agriculture tended to have more positive perceptions about agriculture.

Teachers tend to teach about subjects with which they are familiar and comfortable (Holmes Group, 1986). Teachers usually heavily draw on their own experience and background as a context for teaching, which directly influences the information that is taught and how it is presented to the students (Humphrey, Stewart & Linhart, 1993). If we want our teachers to be able to teach about our food and fiber system, they must be knowledgeable about the subjects and concepts that are a part of the food and fiber system.

From these statements, we can conclude that there was a need for a way to help teachers become more familiar and knowledgeable about agriculture in order to help them teach it to their students. Balschweid, Thompson and Cole (1997) found that teachers who had participated in the Summer Agriculture Institute at Oregon State University only integrated agriculture into five or fewer lessons per school year. They also found that major barriers to integrating agriculture into existing curriculum were the lack of information and the time it takes to make changes in the curricula. The Food and Fiber Systems Literacy project, sponsored by the W. K. Kellogg Foundation was intended to provide lessons, background information and inservice training to teachers at selected test schools in order to integrate food and fiber concepts into the curriculum in kindergarten through eighth grade. To determine the effectiveness of the project, it was necessary to evaluate the changes in the teachers’ attitudes and perceptions about our food and fiber system.
According to Malcolm (1997), an evaluation of the Food and Fiber Systems Literacy project needed to be conducted at the end of the first year of the project. Malcolm said the evaluation should attempt to evaluate the changes in the attitudes and perceptions of the teachers as a result of the project.

**Objectives**

The specific objectives of this study were to:

1. Determine the effects of the Food and Fiber Systems Literacy project on the participating teachers' attitudes and perceptions about agriculture.

2. Assess teachers' perceptions about how the Food and Fiber Systems Literacy project has affected students, classrooms and their teaching.

3. Assess teachers' perceptions about how the Food and Fiber Systems Literacy project has impacted their communities, schools and student engagement and achievement.

**Assumptions**

The following assumptions were made concerning this study:

1. Teachers in kindergarten through eighth grade have some knowledge and perceptions about agriculture.

2. Agriculture affects those who teach kindergarten through eighth grade in some way.
3. Agriculture is important to the future of this country, and teaching elementary students about our food and fiber system will benefit the food and fiber system.

Limitations

The population for this study was limited to those teachers who voluntarily participated in the Food and Fiber Systems Literacy project at the three test schools selected.

Results of this study can only be inferred to the teachers who participated in the Food and Fiber Systems Literacy project at the three test schools in: Yale, Oklahoma; Townsend, Montana; and Woodland, California.

The time frame of this study was from the time the pretest was administered in May 1997 through the time the posttest was administered in May of 1998.

Definitions

Agricultural literacy: Understanding and possessing a knowledge of our food and fiber system (Frick, 1990).

Food and fiber systems: Includes all activities necessary to produce, harvest, process and transport food and fiber products (U. C. Davis, Milton Hershey School, 1996).
CHAPTER TWO

REVIEW OF LITERATURE

Defining Agricultural Literacy

Since the Smith-Hughes act of 1917, education in agriculture, which is what agricultural education is all about, has been well defined. Education about agriculture, however, does not necessarily fit into this definition. In 1988, Frick contended that, “The virtues of vocational agriculture have been suppressed because of the demand for vocational training in agriculture outlined in the Smith-Hughes legislation in 1917” (p.14). This is a major concern to the future of agriculture in this nation. Agriculture is too important a topic to be taught only to the small proportion of students who take vocational agriculture or are pursuing a career in agriculture (National Resource Council, 1988). Most people would agree that there is a need for a basic understanding of agriculture, the agriculture industry, and its importance to the citizens of this country and the world, but the general public has a hard time defining “agricultural literacy” (Frick, Birkenholz, Gardner & Machtmes 1995, p. 130).

Literacy has often been associated with the ability to read and write at a functional level in society. Of course as society has changed, so has our definition of literacy. In the 1800’s, some would define a literate person as someone who could read and write their own name, but now the term literacy includes reading signs, packages, and a bus.
schedule (Miller, 1989). The definition of literacy changes with the times, but always means that a person has a functional level of ability in order to respond to real world reading tasks (Bornmuth, 1975). Similarly, functional agricultural literacy can be thought of as a minimum level of knowledge and understanding, and not as a perfect level of understanding (Frick & Spotanski, 1990).

In order to find an acceptable definition of agricultural literacy in modern society, we can start with Douglass’s early attempt (1985):

There are certain pieces of information which are so basic to agricultural literacy that serious consideration should be given to their integration into any curriculum. The list is still tentative, but it includes a description of the place of agriculture in human history; a philosophical investigation of the purposes of agriculture, with some attention to ethical considerations; and an examination of the links between nutrition and human development from the perspective of social science. It also includes a basic introduction to the biochemistry of agroecosystems; a comparative analysis of agricultural technologies, including an assessment of their impacts on ecological and social communities; a description of the institutions of political power that shape agricultural decisions in different societies; and a basic treatment of the demographic transition from higher to lower rates of population growth and the roles that the consumption and production of food play in that transition. (p. 18)

With this as an example of a very thorough, but not very functional definition of agricultural literacy, we can turn to a shorter version of this definition that appeared in The Agricultural Education Magazine by Law and Pepple (1990):

Agricultural literacy may be defined as the development of the individual in the principles and concepts underlying modern agricultural technology. As defined here, it applies to producing, processing, distributing, marketing, and consuming the products of the food and fiber system. It also includes an awareness of the impact agriculture has on the environment, on society, and on everyday living of the individual. (p. 10)
This definition was certainly shorter and more to the point, but did not provide a functional definition. In an article appearing in *The Agricultural Education Magazine*, Frick and Spotanski (1990) laid out three basic areas that agricultural literacy needs to address: 1) an understanding of the applied processes or methods of agriculture, 2) the basic vocabulary of agricultural terms, and 3) the impact of agriculture on society. Frick devised a more detailed definition of agricultural literacy for his doctoral dissertation, which is probably the most accepted definition today:

Agricultural literacy is understanding and possessing a knowledge of our food and fiber system. An individual possessing such knowledge would be able to synthesize, analyze, and communicate basic information about agriculture. Basic agricultural knowledge includes: the production of plant and animal products, the economic impact of agriculture, its societal significance, agriculture's important relationship with natural resources and the environment, the marketing and processing of agricultural products, public agricultural policies, the global significance of agriculture, and the distribution of agricultural products. (1990, p. 41)

Through this definition, we begin to understand that Agricultural literacy is not just knowing the procedures associated with production agriculture or simply knowing a group of facts that are associated with agriculture. Rather, it is a basic understanding of agriculture and the food and fiber industry, and of the importance of this industry to the citizens of this country (Frick & Wilson, 1996).

*Agricultural Education*

Agricultural education has changed along with the new goals and requirements for agricultural literacy. In the 1963 Vocational Education Act expanded agricultural
education to include career preparation in fields other than just agricultural production (U.S. Congress, 1963). Still, the majority of America’s youth know little about agriculture when they enter school, and are only slightly better informed when they graduate from high school (National Research Council, 1988).

In a Hall’s study, Agricultural Literacy Programs: Current Status (1991), it was found that 18 states do not have a current program of instruction about agriculture as of February 1991. This indicated that a significant amount of work needed to be done so students received education about agriculture in at least one grade (Hall, 1991).

With the National Research Council’s recommendation (1988) that children receive instruction about agriculture from kindergarten through twelfth grade, it was evident that something needed to be done differently. According to Stewart (1989), agricultural literacy information must be infused into the existing curricula, which would eliminate the need for a separate class. Williams and White (1991), while commenting on the fragmentation of current agricultural instruction, pointed out that, “If we expect our nation’s youth to understand and appreciate American agriculture, instruction about agriculture must be included in the day to day curriculum” (p. 10).

In addition, relatively fewer students are taking vocational agriculture in high school. Agriculture is too important a subject to only be taught to the relatively small percentage of students pursuing vocational agriculture studies or considering careers in agriculture (National Research Council, 1988). Dyer and Osborne (1994) stated that the Illinois enrollment in high school agriculture programs had dropped from 29,502 students in 1979 to 11,733 students in 1991. Possible reasons for this shift were that more
students were planning to go to college, which leaves fewer elective credits in which to take courses about agriculture; the urbanization of rural areas; and a possible shift in the image and perceptions about agriculture (Dyer & Osborne 1994).

According to the National Research Council:

Few systematic educational efforts are made to teach or otherwise develop agricultural literacy in students of any age. Although children are taught something about agriculture, the material tends to be fragmented, frequently outdated, usually farm-oriented, and often negative or condescending in tone. (National Research Council 1988, p.9)

This goes beyond just agricultural education in our schools. Every successive generation in our society has become increasingly agriculturally illiterate (Birkenholz, 1990). All people, regardless of ethnicity or sex, depend on and have a vested interest in agriculture (Law & Peppe, 1990).

The general public gets its knowledge of agriculture from a variety of sources. “Public impressions of agriculture have been tainted by the actions of special interest groups and information provided through the media” (Lichte & Birkenholz 1993, p. 15). The public often bases personal decisions and policy decisions on information that is misconceived and selectively incomplete, as was demonstrated by the “Alar” scare in the 1980’s (Ames, 1989; EPA, FDA & USDA, 1989; Evans, 1989; Moore, 1989). Tinsdale (1991) further explains how this type of public reaction can happen:

As fewer people are directly involved in production agriculture, public support of the industry becomes even more important. Agriculturally literate people can make personal informed decisions about agriculturally related topics such as food safety, genetic engineering and pesticide versus non-pesticide issues. Those
without this basic understanding react without reason, frightened for themselves and their families. The resulting damage to the industry is not easily repaired (p. 11)

Related Articles

In their 1993 study, Humphrey, Stewart and Linhart reported that teachers with agricultural experience tend to have greater knowledge and a more positive perception of agriculture than teachers with little to no experience in agriculture. This presents a challenge for agricultural educators since relatively few people have direct experience with agriculture.

Harris and Birkenholz (1996) found that instructors who taught in a school with an agricultural education program had relatively high knowledge scores and positive perceptions about agriculture. Dyer and Osborne (1995) also stated that guidance counselors in schools with applied science in agriculture courses had a more positive attitude toward agriculture. Dyer, Lacey and Osborne (1996) looked at the affect of high school agriculture courses on freshmen in the College of Agriculture at the University of Illinois. They found that those who had high school agriculture courses or were members of 4-H and FFA had higher knowledge scores and a more positive perception of agriculture than those who have had little to no exposure to agriculture. They also found that students with these exposures were significantly more likely to complete their degrees in the College of Agriculture.

Frick, Birkenholz, Gardner & Machtmes (1995) surveyed rural and urban inner city students, and found that both had very low knowledge scores in the areas of: Plants
in Agriculture and Agricultural Policy Issues. They also recommended that instructional assistance be provided to both preservice and inservice elementary and secondary teachers to assist them in bringing agricultural concepts into the classroom. In a similar study of 4-H members, it was shown that 4-H members have a high overall mean of agricultural knowledge, though they, too, were particularly low in the area of Plants in Agriculture (Frick, Birkenholz & Machtmes 1995). Flood and Elliot’s (1994) study in Arizona found no significant differences in agricultural literacy between people who were 4-H members and the rest of their population.

Many studies have been conducted on the feasibility of integrating agriculture into the science curriculum in secondary and elementary schools. Johnson and Newman’s 1993 study found that administrators, counselors and science teachers who are in schools with a pilot agriscience course have favorable perceptions and more support for the new curriculum. They went on to point out that science teachers are very agreeable to granting science credit to agriscience courses. Trexler (1997) recommended that education about our food and fiber system would help supplement areas of science that are neglected in our schools because they are difficult to teach, such as the interrelationships between plants and animals.

In relation to this study, Malcolm (1997) being a member of 4-H or FFA affected how teachers responded to questions relating to understanding agriculture.
CHAPTER THREE

METHODOLOGY

This chapter describes the procedures that were used in completing this study. This chapter is organized into six different sections; (1) Population Selection, (2) Instrument Design, (3) Instrument Validation, (4) Focus Group Interview Question Development, (5) Data Collection and (6) Data Analysis.

Population Selection

The Food and Fiber Project committee sought the participation of three public schools in different geographic regions of the nation. They selected three different states for school sites based on geographic, culture, ethnic, and socio-economic diversity. The committee wanted a school from a rural area, one from a suburban area, and one from an urban area. Within each of the three states (California, Montana and Oklahoma), several public schools were targeted for an interview. The schools were selected for this project based on an interview conducted by the selection committee.

The teacher population for this study consisted of 51 teachers from the three different schools ranging from elementary to eighth grade middle school teachers. Of the 51 teachers participating in this project, 38 were female and 13 were male. Ten of those teachers were from a town larger than 100,000 people. Eighteen teachers were from a town with a population of 10,000 to 100,000. Four teachers lived near a town with a
population of 2501 to 10,000. Another thirteen teachers were from a town with a population between 1000 and 2500. Four teachers were from a town with less than 1000 people.

**Instrument Design**

This quasi-experimental study employed a one-group pretest, posttest treatment format (Gall, Borg & Gall, 1996). The instrument assessed the Food and Fiber Systems literacy level of the teachers before they started teaching the Food and Fiber Systems curriculum in their classroom.

This instrument was developed with the assistance of a committee of agricultural educators and statisticians at two land grant institutions in the United States. The data collection instrument used in the pretest was organized into two different sections. The first section contained a series of items that addressed attitudes and perceptions of Food and Fiber Literacy. A series of 40 questions were chosen from the five different sections in the Food and Fiber Systems Literacy Framework (1996). The five different concept areas were (A) Understanding Agriculture, (B) Historical, Cultural, and Geographical Significance, (C) Science: Agricultural - Environmental Interdependence, (D) Business and Economics, and (E) Food, Nutrition, and Health. Within each section a series of items were compiled. The final set of items used on the survey was refined by a group of experts whose field of expertise and knowledge was the Food and Fiber industry. Eight items from each of the five sections were chosen to form a 40-item survey. A Likert-type scale, ranging from (1) Strongly Agree to (5) Strongly Disagree, allowed the teachers to
respond to the 40 items related to the food and fiber system. This instrument was distributed for the posttest after one full year of the Food and Fiber Systems Literacy Project. The data collection instrument is available in Appendix A.

The second section of the data instrument was also developed with the assistance of a committee of agricultural educators and statisticians at two land grant institutions in the United States. This section consisted of questions directed to the respondents in an attempt to collect personal and situational demographic information. These questions were related to age, gender, size of town in which they live, history of agriculture background, teaching experience and education level. Demographic information was collected only in the pretest. The demographic portion of the instrument is available in Appendix B.

Instrument Validation

A teacher pilot test was conducted with 35 elementary level student teachers at Montana State University. The pilot test was validated after a review of clarity, readability, and relevance to the objectives of the research project. The respondents said it was well written and easily understood. Minor corrections were made, and the instrument was deemed ready for the population group.

The Cronbach’s alpha reliability coefficient computed for the pilot test was .78. According to the experts on the panel, this instrument was considered a valid tool for assessing the Food and Fiber literacy of this project.
Focus Group Interview Question Development

Focus group interview questions were developed by project staff from Montana State University and Oklahoma State University. Focus group interviews were conducted during mid-year and at the end of the Food and Fiber Literacy project.

Data Collection

Pretest surveys were distributed at the inservice training sessions, and were completed by the teachers before the training began. The first inservice training was held on May 14, 1997 in Townsend, Montana. A total of 9 teachers responded to the questions on the instrument survey. The second inservice training was held at Yale, Oklahoma on May 24, 1997. A total of 16 teachers responded to the questions at the second training. The third training was held in Woodland, California, during the month of June, where 26 teachers attended the inservice training. Those teachers who attended more than one training took the pretest instrument only once.

All of the pretest surveys were returned since it was a captive audience. The instruments were all hand-scored by the researcher. All data was entered into a Microsoft Excel spreadsheet.

Posttest surveys were distributed after the three schools had participated in the project for one full school year. All posttest instruments were hand-scored by the researcher and responses were entered into a Microsoft Excel spreadsheet.
Project staff conducted focus group interviews at each of the three schools in the middle of the school year and again at the end of the school year. The interviews were videotaped and later reviewed and typed out by the researcher. The notes from each interview are available in Appendix C. The purpose of the focus group interviews was to obtain information about the Food and Fiber project that would reveal teacher reaction and sentiment toward the project (University of Texas, 1996). The following information could not be collected and synthesized through traditional survey methods; therefore, focus group interviews were used. The purpose of the mid-year and end of year interviews was different; therefore, a different set of questions was designed for each interview that included subsequent subcategories of questions.

The focus of the mid-year interview was to obtain factual information and teacher feelings toward the Food and Fiber Literacy project. The mid-year interview was conducted near the break between semesters at all three schools.

The focus of the end of year interviews was to collect information on teachers' perceptions of the effects of the Food and Fiber project on student engagement and achievement. The end-of-the-year interviews were conducted in mid to late May and early June.

Data Analysis

The data were entered into Microsoft Excel® spreadsheets as the instruments were mailed back to the researcher. During the input process on the teacher instruments, the researcher keyed in the numbered response they indicated for each item, (1) Strongly
Agree, (2) Agree, (3) Neutral, (4) Disagree, and (5) Strongly Disagree. After each item was entered into the spreadsheet, the items were then categorized into the five Food and Fiber literacy framework concepts. Means were computed for each of the framework concepts. Data was then transferred into SPSS-7.5 for Windows for a one-way Analysis of Variance (ANOVA) analysis to determine differences among the three different schools and the five major Food and Fiber Literacy framework questions. The results were then compiled into comparative tables for more accurate reporting.

The selected demographic variables for the teacher instrument were entered into a Microsoft Excel spreadsheet. The researcher sorted the data by assigning a number code to common responses. The data were compiled for analysis of significant differences among the schools and its teachers.

Information collected in the focus group interviews was compiled and a complete report is found in Appendix C. All responses that occurred at more than one of the schools were compiled and explained in Chapter Four.
CHAPTER FOUR

RESULTS OF THE STUDY

This chapter presents results to satisfy the objectives of the study. The results are based on data collected from a teacher Food and Fiber Systems survey and from focus group interviews conducted with Food and Fiber project teachers.

Data collected represent three different kinds of schools throughout the United States. The three schools represented in this study are (1) urban (Woodland, California) school, (2) suburban (Yale, Oklahoma) school, and (3) rural (Townsend, Montana) school. The results of this data are only generalizable to the teachers and students of the Food and Fiber Literacy project.

Demographics

Upon receiving the instruments, five pretest surveys were found to have limited use due to a missing page in the demographic section for a response rate of 51 (93%) out of 56. These five instruments were still used in the pretest data; however, with incomplete demographic information, they were not used for input on the demographic section. A total of 51 completed instruments were used for demographic data analysis.

The data presented in Table 1 provide an indication of the demographic characteristics of the respondent groups. The four subgroups reported in Table 1 consist of Rural-Montana, Suburban-Oklahoma, and Urban-California, and Total- all three
schools combined. The rural contingent of teachers had nine respondents who represented the rural school. The suburban group of teachers had sixteen respondents who represented the suburban school. The urban group of teachers had twenty-six respondents who represented the urban school.

From the total of 51 respondents, 38 (75%) indicated they were female, while 13 (25%) teachers responded their gender was male. Out of 51 total teachers, 14 (28%) of the teachers reported having grown up on a farm and/or ranch. Thirteen (25%) teachers responded having lived in a rural area (a population less than 2500 people). Another thirteen (25%) teachers indicated they grew up in a town or city (a population greater than 50,000 people). Eleven (22%) teachers said they grew up in a suburb (2500-50,000 people).

Out of fifty teachers, 33 (66%) said they had relatives who lived or worked on a farm and/or ranch. Seventeen (34%) reported they did not have any relatives who lived or worked on a farm and/or ranch. For this variable there was one non-respondent.

The majority of all the teachers, 32 (63%) of 51 teachers indicated they did not have any relatives who worked in a non-production agricultural business. Nineteen (37%) teachers reported that they did have relatives who worked in a non-production agricultural business.

Of 51 total teachers, 43 (84%) indicated they did not take any agricultural courses in either high school or college. Eight (16%) teachers said they did take at least one agricultural course in either high school or college.
The majority of all the teachers combined, 36 (71%) of 51 teachers said they had not been a member of FFA or 4-H. Fifteen (29%) teachers indicated they had been members of FFA and/or 4-H.

Table 1. Selected Demographics of the teachers in the Food and Fiber Literacy project.

<table>
<thead>
<tr>
<th>Selected Demographics of the Teachers in the Food and Fiber Literacy Project</th>
<th>Rural-Montana</th>
<th>Suburban-Oklahoma</th>
<th>Urban-California</th>
<th>Total-all three schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of participants</td>
<td>n=9 No. (percentage)</td>
<td>n=16 No. (percentage)</td>
<td>n=26 No. (percentage)</td>
<td>N=51 No. (percentage)</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>2 (22%)</td>
<td>3 (19%)</td>
<td>8 (31%)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>7 (78%)</td>
<td>13 (81%)</td>
<td>18 (69%)</td>
</tr>
<tr>
<td>Where did you grow up?</td>
<td>Town/City</td>
<td>2 (22%)</td>
<td>1 (6%)</td>
<td>10 (38%)</td>
</tr>
<tr>
<td></td>
<td>Suburb</td>
<td>1 (11%)</td>
<td>1 (6%)</td>
<td>9 (35%)</td>
</tr>
<tr>
<td></td>
<td>Rural Area</td>
<td>2 (22%)</td>
<td>9 (56%)</td>
<td>2 (8%)</td>
</tr>
<tr>
<td></td>
<td>Farm/Ranch</td>
<td>4 (44%)</td>
<td>5 (32%)</td>
<td>5 (19%)</td>
</tr>
<tr>
<td>Do you have relatives who live or work on a farm and/or ranch?</td>
<td>Yes</td>
<td>2 (22%)</td>
<td>15 (94%)</td>
<td>11 (44%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>7 (78%)</td>
<td>1 (6%)</td>
<td>14 (56%)</td>
</tr>
<tr>
<td>Do you have relatives who work in a non-production agricultural business?</td>
<td>Yes</td>
<td>4 (44%)</td>
<td>6 (37%)</td>
<td>9 (35%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>5 (56%)</td>
<td>10 (63%)</td>
<td>17 (65%)</td>
</tr>
<tr>
<td>Did you take agricultural courses in High School or College?</td>
<td>Yes</td>
<td>3 (33%)</td>
<td>2 (13%)</td>
<td>4 (15%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>6 (67%)</td>
<td>14 (87%)</td>
<td>22 (85%)</td>
</tr>
<tr>
<td>Were you a Member of FFA and/or 4-H?</td>
<td>Yes</td>
<td>3 (33%)</td>
<td>10 (63%)</td>
<td>2 (8%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>6 (67%)</td>
<td>6 (37%)</td>
<td>24 (92%)</td>
</tr>
</tbody>
</table>

b Schools were coded: Northwest (Rural); Midwest (Suburban); West (Urban)

c Table 2 depicts the teachers' ratings of six issue areas. With a rating of (1) being most important through (6) being least important, the teachers rated the six most
important issues related to the Food and Fiber industry. The teachers involved with the Food and Fiber Literacy project believed that Natural Resource Base was the most important issue related to our Nation’s Food and Fiber Literacy project, with a rating of 2.33. Food Safety, with a rating of 2.62 was the second most important issue related to the Food and Fiber industry for the teachers. The third most important issue related to the Food and Fiber industry at a rating of 2.74 was Agricultural practices that affect the environment. Current government economic policies that impact agricultural production was the fourth most important issue related to the Food and Fiber industry at a rating of 3.78. The teachers felt that the Viability of our rural economic base at a rating of 4.32 was the fifth most important issue related to the Food and Fiber system. The least important issue for the teachers involved with the Food and Fiber literacy project was Animal Welfare with a rating of 4.87.

Table 2. Ratings of issues related to the food and fiber industry.

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Resource Base</td>
<td>2.33</td>
</tr>
<tr>
<td>Food Safety</td>
<td>2.62</td>
</tr>
<tr>
<td>Agricultural Practices That Affect the Environment</td>
<td>2.74</td>
</tr>
<tr>
<td>Current Government Policies That Impact Agricultural Production</td>
<td>3.78</td>
</tr>
<tr>
<td>Viability of Our Rural Economic Base</td>
<td>4.32</td>
</tr>
<tr>
<td>Animal Welfare</td>
<td>4.87</td>
</tr>
</tbody>
</table>

Attitudes and Perceptions

The teachers at each school responded to a series of items that were related to the Food and Fiber Framework. There were five major Framework categories:
Understanding Agriculture; Historical, Geographical, and Cultural significance; Science: Food and Fiber Environmental Interdependence; Business and Economics; and Food, Health, and Nutrition. The teachers were asked to respond on a 5 point Likert-type scale. Response values were as follows: (1) strongly agree, (2) agree, (3) neutral, (4) disagree and (5) strongly disagree. Therefore, the lower the value, the more they agreed with the item. This survey was given before the project began, hereafter referred to as the pretest, and administered again after the project had run for a full school year, hereafter referred to as the posttest.

The items were separated out into the five major categories mentioned above. Tables 3 through 22 depict t-test results comparing teacher responses in the pretest and posttest. The first column, labeled “No.” corresponds to the item number (1-40) as that item appeared on the survey. The actual text of the item as it appeared on the survey appears in the second column. The fourth and fifth columns show the means and standard deviations of the responses in accordance with the 5-point Likert-type scale. The number before the slash is from the pretest, and the number after the slash is from the posttest. The column labeled “T” gives the t statistic for each of the items, and the column labeled “Df” indicates the degrees of freedom associated with each t-test. The last column gives the two-tailed significance for each t-statistic. Each item in the significance column that is followed by an asterisk (*) is significant at an alpha level of .05.

Tables 3 through 6 show the t-tests for items that related to “Understanding Agriculture”. Table 3 contains only data from Yale, Table 4 presents data from
Woodland, Table 5 depicts data from Townsend, and Table 6 displays the culmination of data from all three schools. The data in these tables show that participants responded significantly different to item 1 (Agriculture involves the management of forests and their natural products) from pretest to posttest at Yale (.032), Woodland (.012), and in the three schools combined (.000). Items 16 (Global market forces affect supply and demand for agricultural products), 21 (The food and fiber system does not constitute a significant number of jobs in the U.S.) and 36 (Agriculture is not a very large industry in America.) were found significant with Yale (.001, .013, .033) and in the three schools combined (.004, .021, .004). Of the items that were found significant, items 1 and 16 had positive t-scores, indicating that respondents agreed more strongly with the item in the posttest than in the pretest. The remaining two items, 21 and 36 had negative t-scores, which would indicate that respondents disagreed more with those items in the posttest than in the pretest.

Tables 7 through 10 show the t-tests for items that related to “Historical, Geographical and Cultural Significance” of food and fiber. Table 7 contains only data from Yale, Table 8 shows data from Woodland, Table 9 displays data from Townsend, and Table 10 presents a composite of data from all three schools. The data in these tables show that item 7 (Many important historical figures, inventions and events have emerged as a result of our constant search for the certainty of food) was answered significantly different in the pretest and posttest at Yale (.047). Item 12 (Civilization’s advancements have nothing to do with agricultural development) shows significance at Yale (.013) and in the three schools combined (.004). Item 32 (Historically, climate and geography have
determined the plants and animals that grow best in a certain region) was significant in the three schools combined data (.012).

Item 7 and item 32 produced positive t-scores, indicating that respondents agreed more strongly with the item in the posttest than in the pretest, while item 12 had negative t-scores, which would indicate that respondents disagreed more with those items in the posttest than in the pretest.

Table 3. T tests for Yale, subcategory 1, Understanding Agriculture.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agriculture involves the management of forests and their natural products.</td>
<td>1.48/1.07</td>
<td>.75/.27</td>
<td>2.268</td>
<td>26.852</td>
<td>.032 *</td>
</tr>
<tr>
<td>6</td>
<td>Human ingenuity has solved numerous problems involved in the production, storage and preparation of food.</td>
<td>1.38/1.21</td>
<td>.59/.43</td>
<td>.909</td>
<td>33</td>
<td>.370</td>
</tr>
<tr>
<td>11</td>
<td>The Food and Fiber system is not an integral part of most states' economies.</td>
<td>3.95/3.79</td>
<td>.86/1.19</td>
<td>.481</td>
<td>33</td>
<td>.634</td>
</tr>
<tr>
<td>16</td>
<td>Global market forces affect supply and demand for agricultural products.</td>
<td>1.95/1.14</td>
<td>.74/.36</td>
<td>3.787</td>
<td>33</td>
<td>.001 *</td>
</tr>
<tr>
<td>21</td>
<td>The food and fiber system does not constitute a significant number of jobs in the U.S.</td>
<td>4.33/4.86</td>
<td>.80/.36</td>
<td>-2.633</td>
<td>29.949</td>
<td>.013 *</td>
</tr>
<tr>
<td>26</td>
<td>A larger world population has no effect on the demand for agricultural products.</td>
<td>4.71/4.43</td>
<td>.56/1.16</td>
<td>.977</td>
<td>33</td>
<td>.336</td>
</tr>
<tr>
<td>31</td>
<td>Agricultural production has kept pace with our world population growth.</td>
<td>3.00/2.71</td>
<td>.84/1.07</td>
<td>.886</td>
<td>33</td>
<td>.382</td>
</tr>
<tr>
<td>36</td>
<td>Agriculture is not a very large industry in America.</td>
<td>4.24/4.86</td>
<td>1.09/5.3</td>
<td>-2.229</td>
<td>30.842</td>
<td>.033 *</td>
</tr>
</tbody>
</table>
Table 4. *T* tests for Woodland, subcategory 1, Understanding Agriculture.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agriculture involves the management of forests and their natural products.</td>
<td>2.27/1.45</td>
<td>.96/.52</td>
<td>2.636</td>
<td>35</td>
<td>.012 *</td>
</tr>
<tr>
<td>6</td>
<td>Human ingenuity has solved numerous problems involved in the production, storage and preparation of food.</td>
<td>1.42/1.55</td>
<td>.50/.69</td>
<td>-.605</td>
<td>35</td>
<td>.549</td>
</tr>
<tr>
<td>11</td>
<td>The Food and Fiber system is not an integral part of most states' economies.</td>
<td>3.85/4.36</td>
<td>1.22/1.03</td>
<td>-1.229</td>
<td>35</td>
<td>.227</td>
</tr>
<tr>
<td>16</td>
<td>Global market forces affect supply and demand for agricultural products.</td>
<td>1.62/1.36</td>
<td>.64/.67</td>
<td>1.080</td>
<td>35</td>
<td>.288</td>
</tr>
<tr>
<td>21</td>
<td>The food and fiber system does not constitute a significant number of jobs in the U.S.</td>
<td>4.15/4.36</td>
<td>.83/1.21</td>
<td>-.611</td>
<td>35</td>
<td>.545</td>
</tr>
<tr>
<td>26</td>
<td>A larger world population has no effect on the demand for agricultural products.</td>
<td>4.50/4.64</td>
<td>.71/.50</td>
<td>-.578</td>
<td>35</td>
<td>.567</td>
</tr>
<tr>
<td>31</td>
<td>Agricultural production has kept pace with our world population growth.</td>
<td>3.00/2.91</td>
<td>1.30/1.22</td>
<td>.198</td>
<td>35</td>
<td>.844</td>
</tr>
<tr>
<td>36</td>
<td>Agriculture is not a very large industry in America.</td>
<td>4.31/4.82</td>
<td>1.26/.40</td>
<td>-1.309</td>
<td>35</td>
<td>.199</td>
</tr>
</tbody>
</table>
Table 5. T tests for Townsend, subcategory 1, Understanding Agriculture

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agriculture involves the management of forests and their natural products.</td>
<td>1.56/1.44</td>
<td>1.01/.53</td>
<td>.292</td>
<td>16</td>
<td>.774</td>
</tr>
<tr>
<td>6</td>
<td>Human ingenuity has solved numerous problems involved in the production, storage and preparation of food.</td>
<td>1.11/1.22</td>
<td>.33/.44</td>
<td>-.603</td>
<td>16</td>
<td>.555</td>
</tr>
<tr>
<td>11</td>
<td>The Food and Fiber system is not an integral part of most states' economies.</td>
<td>4.00/4.67</td>
<td>1.22/.50</td>
<td>-1.512</td>
<td>16</td>
<td>.150</td>
</tr>
<tr>
<td>16</td>
<td>Global market forces affect supply and demand for agricultural products.</td>
<td>1.33/1.44</td>
<td>.50/.53</td>
<td>-.459</td>
<td>16</td>
<td>.653</td>
</tr>
<tr>
<td>21</td>
<td>The food and fiber system does not constitute a significant number of jobs in the U.S.</td>
<td>4.44/4.78</td>
<td>.88/.44</td>
<td>-1.014</td>
<td>11.765</td>
<td>.331</td>
</tr>
<tr>
<td>26</td>
<td>A larger world population has no effect on the demand for agricultural products.</td>
<td>4.78/4.78</td>
<td>.44/.44</td>
<td>0.000</td>
<td>16</td>
<td>1.000</td>
</tr>
<tr>
<td>31</td>
<td>Agricultural production has kept pace with our world population growth.</td>
<td>3.00/2.78</td>
<td>1.00/1.20</td>
<td>.426</td>
<td>16</td>
<td>.675</td>
</tr>
<tr>
<td>36</td>
<td>Agriculture is not a very large industry in America.</td>
<td>4.11/4.56</td>
<td>1.05/.53</td>
<td>-1.131</td>
<td>16</td>
<td>.275</td>
</tr>
</tbody>
</table>
Table 6. T tests for three schools combined, subcategory I. Understanding Agriculture.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agriculture involves the management of forests and their natural products.</td>
<td>1.86/1.29</td>
<td>.96/.46</td>
<td>3.728</td>
<td>84.460</td>
<td>.000 *</td>
</tr>
<tr>
<td>6</td>
<td>Human ingenuity has solved numerous problems involved in the production, storage and preparation of food.</td>
<td>1.36/1.32</td>
<td>.52/.53</td>
<td>.294</td>
<td>88</td>
<td>.769</td>
</tr>
<tr>
<td>11</td>
<td>The Food and Fiber system is not an integral part of most states’ economies.</td>
<td>3.91/4.21</td>
<td>1.08/1.04</td>
<td>-1.273</td>
<td>88</td>
<td>.206</td>
</tr>
<tr>
<td>16</td>
<td>Global market forces affect supply and demand for agricultural products.</td>
<td>1.70/1.29</td>
<td>.69/.52</td>
<td>2.938</td>
<td>88</td>
<td>.004 *</td>
</tr>
<tr>
<td>21</td>
<td>The food and fiber system does not constitute a significant number of jobs in the U.S.</td>
<td>4.27/4.68</td>
<td>.82/.77</td>
<td>-2.347</td>
<td>88</td>
<td>.021 *</td>
</tr>
<tr>
<td>26</td>
<td>A larger world population has no effect on the demand for agricultural products.</td>
<td>4.63/4.59</td>
<td>.62/.82</td>
<td>.241</td>
<td>88</td>
<td>.810</td>
</tr>
<tr>
<td>31</td>
<td>Agricultural production has kept pace with our world population growth.</td>
<td>3.00/2.79</td>
<td>1.08/1.12</td>
<td>.865</td>
<td>88</td>
<td>.390</td>
</tr>
<tr>
<td>36</td>
<td>Agriculture is not a very large industry in America.</td>
<td>4.25/4.76</td>
<td>1.15/.50</td>
<td>-2.934</td>
<td>81.218</td>
<td>.004 *</td>
</tr>
</tbody>
</table>
Table 7. T tests for Yale, subcategory 2, Historical Geographical and Cultural Significance.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Food availability plays a key role in contemporary civilization.</td>
<td>1.24/1.07</td>
<td>.44/.27</td>
<td>1.400</td>
<td>32.842</td>
<td>.171</td>
</tr>
<tr>
<td>7</td>
<td>Many important historical figures, inventions and events have emerged as a result of our constant search for the certainty of food.</td>
<td>1.57/1.21</td>
<td>.60/.43</td>
<td>2.036</td>
<td>32.798</td>
<td>.047 *</td>
</tr>
<tr>
<td>12</td>
<td>Civilization's advancements have nothing to do with agricultural development.</td>
<td>4.43/4.86</td>
<td>.60/.36</td>
<td>-2.636</td>
<td>32.807</td>
<td>.013 *</td>
</tr>
<tr>
<td>17</td>
<td>Agricultural trade stimulated the development of measurement, accounting and written communication.</td>
<td>1.95/1.57</td>
<td>.80/.51</td>
<td>1.567</td>
<td>33</td>
<td>.127</td>
</tr>
<tr>
<td>22</td>
<td>Agriculture's use of natural resources and it's effect on the environment draws concern from people in every society.</td>
<td>2.29/1.86</td>
<td>1.01/.36</td>
<td>1.784</td>
<td>26.983</td>
<td>.086</td>
</tr>
<tr>
<td>27</td>
<td>Historically, climate and geography have determined the plants and animals that grow best in a certain region.</td>
<td>1.71/1.50</td>
<td>.64/.52</td>
<td>1.039</td>
<td>33</td>
<td>.306</td>
</tr>
<tr>
<td>32</td>
<td>Historically, climate and geography have determined the plants and animals that grow best in a certain region.</td>
<td>2.33/1.86</td>
<td>1.11/.66</td>
<td>1.586</td>
<td>32.715</td>
<td>.122</td>
</tr>
<tr>
<td>37</td>
<td>Some societal issues are directly related to the food and fiber system.</td>
<td>2.00/1.64</td>
<td>.71/.50</td>
<td>1.636</td>
<td>33</td>
<td>.111</td>
</tr>
</tbody>
</table>
Table 8. T tests for Woodland, subcategory 2. Historical Geographical and Cultural Significance.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Food availability plays a key role in contemporary civilization.</td>
<td>1.27/1.27</td>
<td>.45/.47</td>
<td>-.021</td>
<td>35</td>
<td>.983</td>
</tr>
<tr>
<td>7</td>
<td>Many important historical figures, inventions and events have emerged as a result of our constant search for the certainty of food.</td>
<td>1.54/1.36</td>
<td>.71/.50</td>
<td>.742</td>
<td>35</td>
<td>.463</td>
</tr>
<tr>
<td>12</td>
<td>Civilization’s advancements have nothing to do with agricultural development.</td>
<td>4.58/4.82</td>
<td>.70/.40</td>
<td>-1.061</td>
<td>35</td>
<td>.296</td>
</tr>
<tr>
<td>17</td>
<td>Agricultural trade stimulated the development of measurement, accounting and written communication.</td>
<td>1.73/1.36</td>
<td>.72/.67</td>
<td>1.437</td>
<td>35</td>
<td>.160</td>
</tr>
<tr>
<td>22</td>
<td>Agriculture’s use of natural resources and it’s effect on the environment draws concern from people in every society.</td>
<td>2.27/2.18</td>
<td>1.04/1.17</td>
<td>.225</td>
<td>35</td>
<td>.823</td>
</tr>
<tr>
<td>27</td>
<td>Historically, climate and geography have determined the plants and animals that grow best in a certain region.</td>
<td>1.50/1.55</td>
<td>.58/.52</td>
<td>-.223</td>
<td>35</td>
<td>.825</td>
</tr>
<tr>
<td>32</td>
<td>Historically, climate and geography have determined the plants and animals that grow best in a certain region.</td>
<td>2.19/1.64</td>
<td>.94/.50</td>
<td>1.844</td>
<td>35</td>
<td>.074</td>
</tr>
<tr>
<td>37</td>
<td>Some societal issues are directly related to the food and fiber system.</td>
<td>1.65/1.73</td>
<td>.69/.79</td>
<td>-.284</td>
<td>35</td>
<td>.778</td>
</tr>
</tbody>
</table>
Table 9. T tests for Townsend, subcategory 2. Historical Geographical and Cultural Significance.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Food availability plays a key role in contemporary civilization.</td>
<td>1.22/1.22</td>
<td>.44/67</td>
<td>.000</td>
<td>16</td>
<td>1.000</td>
</tr>
<tr>
<td>7</td>
<td>Many important historical figures, inventions and events have emerged as a result of our constant search for the certainty of food.</td>
<td>1.44/1.44</td>
<td>.53/73</td>
<td>.000</td>
<td>16</td>
<td>1.000</td>
</tr>
<tr>
<td>12</td>
<td>Civilization’s advancements have nothing to do with agricultural development.</td>
<td>4.44/4.78</td>
<td>.73/44</td>
<td>-1.77</td>
<td>16</td>
<td>.257</td>
</tr>
<tr>
<td>17</td>
<td>Agricultural trade stimulated the development of measurement, accounting and written communication.</td>
<td>1.78/1.78</td>
<td>.44/97</td>
<td>0.00</td>
<td>11.160</td>
<td>1.000</td>
</tr>
<tr>
<td>22</td>
<td>Agriculture’s use of natural resources and it’s effect on the environment draws concern from people in every society.</td>
<td>2.44/1.78</td>
<td>1.33/97</td>
<td>1.212</td>
<td>16</td>
<td>.243</td>
</tr>
<tr>
<td>27</td>
<td>Historically, climate and geography have determined the plants and animals that grow best in a certain region.</td>
<td>1.33/1.22</td>
<td>.50/.44</td>
<td>.500</td>
<td>16</td>
<td>.624</td>
</tr>
<tr>
<td>32</td>
<td>Historically, climate and geography have determined the plants and animals that grow best in a certain region.</td>
<td>2.56/2.11</td>
<td>1.01/.78</td>
<td>1.042</td>
<td>16</td>
<td>.313</td>
</tr>
<tr>
<td>37</td>
<td>Some societal issues are directly related to the food and fiber system.</td>
<td>1.78/1.89</td>
<td>.67/.33</td>
<td>-.447</td>
<td>16</td>
<td>.661</td>
</tr>
</tbody>
</table>
Table 10. T tests for three schools combined, subcategory 2, Historical Geographical and Cultural Significance.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Food availability plays a key role in contemporary civilization.</td>
<td>1.25/1.18</td>
<td>.44/.46</td>
<td>.760</td>
<td>88</td>
<td>.449</td>
</tr>
<tr>
<td>7</td>
<td>Many important historical figures, inventions and events have emerged as a result of our constant search for the certainty of food.</td>
<td>1.54/1.32</td>
<td>.63/.53</td>
<td>1.702</td>
<td>78.674</td>
<td>.093</td>
</tr>
<tr>
<td>12</td>
<td>Civilization's advancements have nothing to do with agricultural development.</td>
<td>4.50/4.82</td>
<td>.66/.39</td>
<td>-2.930</td>
<td>87.927</td>
<td>.004 *</td>
</tr>
<tr>
<td>17</td>
<td>Agricultural trade stimulated the development of measurement, accounting and written communication.</td>
<td>1.82/1.56</td>
<td>.72/.70</td>
<td>1.697</td>
<td>88</td>
<td>.093</td>
</tr>
<tr>
<td>22</td>
<td>Agriculture's use of natural resources and it's effect on the environment draws concern from people in every society.</td>
<td>2.30/1.94</td>
<td>1.06/.85</td>
<td>1.782</td>
<td>81.245</td>
<td>.079</td>
</tr>
<tr>
<td>27</td>
<td>Historically, climate and geography have determined the plants and animals that grow best in a certain region.</td>
<td>1.55/1.44</td>
<td>.60/.50</td>
<td>.913</td>
<td>88</td>
<td>.364</td>
</tr>
<tr>
<td>32</td>
<td>Historically, climate and geography have determined the plants and animals that grow best in a certain region.</td>
<td>2.30/1.85</td>
<td>1.01/.66</td>
<td>2.566</td>
<td>87.483</td>
<td>.012 *</td>
</tr>
<tr>
<td>37</td>
<td>Some societal issues are directly related to the food and fiber system.</td>
<td>1.80/1.74</td>
<td>.70/.57</td>
<td>.481</td>
<td>88</td>
<td>.631</td>
</tr>
</tbody>
</table>
Tables 11 through 14 show the t-tests for items related to subcategory 3, “Science: Food and Fiber – Environmental Interdependence”. Table 11 contains only data from Yale, Table 12 presents data from Woodland, Table 13 displays data from Townsend, and Table 14 contains the composite of data from all three schools. The data in these tables show that items 3 (Innovations have helped solve problems related to many aspects of the food and fiber industry) and 18 (Production within the Food and Fiber system contributes to the depletion of resources) were answered significantly different in the pretest and posttest at Yale (.039, .010). Item 23 (Food production systems, when designed to work with the environment, can reverse the effects of pollution) indicates a significantly different response at Woodland (.040). Item 28 (The food and fiber system is dependent on non-renewable resources) was significant at Townsend (.049) and in the three schools combined (.018). All significant items show positive t-scores, indicating that respondents agreed more strongly with the items in the posttest than in the pretest.

Tables 15 through 18 show the t-tests for items related to “Business and Economics”. Table 15 contains only data from Yale, Table 16 presents data from Woodland, Table 17 displays data from Townsend, and Table 18 contains a composite of data from all three schools. The data in these tables show that item 9 (The import and export of agricultural commodities is a major concern of foreign policy makers) was answered significantly different in the pretest and posttest at Woodland (.046) and at the three schools combined (.008). Item 19 (Each step from production to consumption adds value to agricultural products) shows significance in the three schools combined (.038). Item 24 (Food exports are the number one income source for America in the world
market) was significant at Yale (.026) while in the three schools combined item 24 was found to be significant at .023. All significant items show positive t-scores, indicating that respondents agreed more strongly with the items in the posttest than in the pretest.


<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Innovations have helped solve problems related to many aspects of the food and fiber industry.</td>
<td>1.52/1.14</td>
<td>.68/.36</td>
<td>2.149</td>
<td>31.820</td>
<td>.039*</td>
</tr>
<tr>
<td>8</td>
<td>The vitality of the food and fiber system now and in the future depends on public understanding of this interdependence.</td>
<td>1.67/1.42</td>
<td>.66/.76</td>
<td>.988</td>
<td>33</td>
<td>.330</td>
</tr>
<tr>
<td>13</td>
<td>Geographic location, climate and soil type generally determine the quantity and diversity of species within an ecosystem.</td>
<td>1.48/1.29</td>
<td>.60/.47</td>
<td>.998</td>
<td>33</td>
<td>.325</td>
</tr>
<tr>
<td>18</td>
<td>Production within the Food and Fiber system contributes to the depletion of resources.</td>
<td>3.00/2.07</td>
<td>1.26/.73</td>
<td>2.747</td>
<td>32.498</td>
<td>.010*</td>
</tr>
<tr>
<td>23</td>
<td>Food production systems, when designed to work with the environment, can reverse the effects of pollution.</td>
<td>2.10/2.23</td>
<td>.83/.60</td>
<td>-.510</td>
<td>32</td>
<td>.613</td>
</tr>
<tr>
<td>28</td>
<td>The food and fiber system is dependent on non-renewable resources.</td>
<td>3.29/2.79</td>
<td>1.01/1.48</td>
<td>1.107</td>
<td>20.997</td>
<td>.281</td>
</tr>
<tr>
<td>33</td>
<td>Food and fiber systems rely on research from many scientific fields.</td>
<td>1.81/1.50</td>
<td>.81/.52</td>
<td>1.260</td>
<td>33</td>
<td>.217</td>
</tr>
<tr>
<td>38</td>
<td>Scientific research has benefited the food and fiber industry.</td>
<td>1.52/1.29</td>
<td>.60/.61</td>
<td>1.140</td>
<td>33</td>
<td>.263</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Innovations have helped solve problems related to many aspects of the food and fiber industry.</td>
<td>1.62/1.36 .57/.50</td>
<td>1.266</td>
<td>35</td>
<td>.214</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>The vitality of the food and fiber system now and in the future depends on public understanding of this interdependence.</td>
<td>1.69/1.45 .74/1.69</td>
<td>.915</td>
<td>35</td>
<td>.366</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Geographic location, climate and soil type generally determine the quantity and diversity of species within an ecosystem.</td>
<td>1.50/1.45 .58/.52</td>
<td>.223</td>
<td>35</td>
<td>.825</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Production within the Food and Fiber system contributes to the depletion of resources.</td>
<td>2.92/2.55 1.02/1.04</td>
<td>1.027</td>
<td>35</td>
<td>.311</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Food production systems, when designed to work with the environment, can reverse the effects of pollution.</td>
<td>2.15/1.64 .67/.67</td>
<td>2.133</td>
<td>35</td>
<td>.040 *</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>The food and fiber system is dependent on non-renewable resources.</td>
<td>3.50/3.00 1.03/1.26</td>
<td>1.262</td>
<td>35</td>
<td>.215</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Food and fiber systems rely on research from many scientific fields.</td>
<td>1.62/1.36 .64/.67</td>
<td>1.080</td>
<td>35</td>
<td>.288</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Scientific research has benefited the food and fiber industry.</td>
<td>1.62/1.36 .75/.50</td>
<td>1.013</td>
<td>35</td>
<td>.318</td>
<td></td>
</tr>
</tbody>
</table>
Table 13. T tests for Townsend, subcategory 3, Science: Food and Fiber – Environmental Interdependence.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Innovations have helped solve problems related to many aspects of the food and fiber industry.</td>
<td>1.22/1.44</td>
<td>.44/.73</td>
<td>-.784</td>
<td>16</td>
<td>.444</td>
</tr>
<tr>
<td>8</td>
<td>The vitality of the food and fiber system now and in the future depends on public understanding of this interdependence.</td>
<td>1.44/1.33</td>
<td>.53/.50</td>
<td>.459</td>
<td>16</td>
<td>.653</td>
</tr>
<tr>
<td>13</td>
<td>Geographic location, climate and soil type generally determine the quantity and diversity of species within an ecosystem.</td>
<td>1.33/1.22</td>
<td>.50/.44</td>
<td>.500</td>
<td>16</td>
<td>.624</td>
</tr>
<tr>
<td>18</td>
<td>Production within the Food and Fiber system contributes to the depletion of resources.</td>
<td>3.00/3.44</td>
<td>1.32/1.13</td>
<td>-.766</td>
<td>16</td>
<td>.455</td>
</tr>
<tr>
<td>23</td>
<td>Food production systems, when designed to work with the environment, can reverse the effects of pollution.</td>
<td>2.22/1.89</td>
<td>.83/.93</td>
<td>.802</td>
<td>16</td>
<td>.434</td>
</tr>
<tr>
<td>28</td>
<td>The food and fiber system is dependent on non-renewable resources.</td>
<td>3.78/2.67</td>
<td>.97/1.22</td>
<td>2.132</td>
<td>16</td>
<td>.049 *</td>
</tr>
<tr>
<td>33</td>
<td>Food and fiber systems rely on research from many scientific fields.</td>
<td>1.33/1.44</td>
<td>.50/.53</td>
<td>-.459</td>
<td>16</td>
<td>.653</td>
</tr>
<tr>
<td>38</td>
<td>Scientific research has benefited the food and fiber industry.</td>
<td>1.44/1.33</td>
<td>.53/.50</td>
<td>.459</td>
<td>16</td>
<td>.653</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre/Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Innovations have helped solve problems related to many aspects of the food and fiber industry.</td>
<td>1.52/1.29</td>
<td>.60/.52</td>
<td>1.854</td>
<td>77.368</td>
<td>.068</td>
</tr>
<tr>
<td>8</td>
<td>The vitality of the food and fiber system now and in the future depends on public understanding of this interdependence.</td>
<td>1.64/1.41</td>
<td>.67/.66</td>
<td>1.595</td>
<td>88</td>
<td>.114</td>
</tr>
<tr>
<td>13</td>
<td>Geographic location, climate and soil type generally determine the quantity and diversity of species within an ecosystem.</td>
<td>1.46/1.32</td>
<td>.57/.47</td>
<td>1.261</td>
<td>79.571</td>
<td>.211</td>
</tr>
<tr>
<td>18</td>
<td>Production within the Food and Fiber system contributes to the depletion of resources.</td>
<td>2.96/2.59</td>
<td>1.14/1.08</td>
<td>1.546</td>
<td>88</td>
<td>.126</td>
</tr>
<tr>
<td>23</td>
<td>Food production systems, when designed to work with the environment, can reverse the effects of pollution.</td>
<td>2.14/1.94</td>
<td>.75/.75</td>
<td>1.239</td>
<td>87</td>
<td>.219</td>
</tr>
<tr>
<td>28</td>
<td>The food and fiber system is dependent on non-renewable resources.</td>
<td>3.46/2.82</td>
<td>1.01/1.31</td>
<td>2.441</td>
<td>56.500</td>
<td>.018 *</td>
</tr>
<tr>
<td>33</td>
<td>Food and fiber systems rely on research from many scientific fields.</td>
<td>1.64/1.44</td>
<td>.70/.56</td>
<td>1.426</td>
<td>88</td>
<td>.157</td>
</tr>
<tr>
<td>38</td>
<td>Scientific research has benefited the food and fiber industry.</td>
<td>1.55/1.32</td>
<td>.66/.53</td>
<td>1.810</td>
<td>80.675</td>
<td>.074</td>
</tr>
</tbody>
</table>
Table 15. T tests for Yale, subcategory 4, Business and Economics.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Agricultural exports are a significant component of US foreign trade.</td>
<td>1.67/1.29</td>
<td>.80/.47</td>
<td>1.779</td>
<td>32.636</td>
<td>.085</td>
</tr>
<tr>
<td>9</td>
<td>The import and export of agricultural commodities is a major concern of foreign policy makers.</td>
<td>2.05/1.50</td>
<td>.92/.65</td>
<td>1.924</td>
<td>33</td>
<td>.063</td>
</tr>
<tr>
<td>14</td>
<td>The food and fiber system involves a production continuum that extends from local farms to factories, markets and tables in every region of the globe.</td>
<td>1.52/1.29</td>
<td>.51/.61</td>
<td>1.248</td>
<td>33</td>
<td>.221</td>
</tr>
<tr>
<td>19</td>
<td>Each step from production to consumption adds value to agricultural products.</td>
<td>2.38/2.00</td>
<td>.86/.88</td>
<td>1.270</td>
<td>33</td>
<td>.213</td>
</tr>
<tr>
<td>24</td>
<td>Food exports are the number one income source for America in the world market.</td>
<td>2.91/2.14</td>
<td>1.00/.86</td>
<td>2.335</td>
<td>33</td>
<td>.026 *</td>
</tr>
<tr>
<td>29</td>
<td>Governments work to ensure that the food and fiber market system operates efficiently and provides stability to the market.</td>
<td>2.62/2.21</td>
<td>1.02/.98</td>
<td>1.168</td>
<td>33</td>
<td>.251</td>
</tr>
<tr>
<td>34</td>
<td>Government policies with respect to agriculture are the result of political action groups or individuals.</td>
<td>1.95/2.00</td>
<td>.80/.78</td>
<td>-1.173</td>
<td>33</td>
<td>.864</td>
</tr>
<tr>
<td>39</td>
<td>International supply and demand influences the types and quality of products produced and traded around the world.</td>
<td>1.71/1.43</td>
<td>.85/.65</td>
<td>1.071</td>
<td>33</td>
<td>.292</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Agricultural exports are a significant component of US foreign trade.</td>
<td>1.42/1.36</td>
<td>.58/.50</td>
<td>.296</td>
<td>35</td>
<td>.769</td>
</tr>
<tr>
<td>9</td>
<td>The import and export of agricultural commodities is a major concern of foreign policy makers.</td>
<td>1.73/1.27</td>
<td>.67/.47</td>
<td>2.066</td>
<td>35</td>
<td>.046*</td>
</tr>
<tr>
<td>14</td>
<td>The food and fiber system involves a production continuum that extends from local farms to factories, markets and tables in every region of the globe.</td>
<td>1.54/1.36</td>
<td>.71/.50</td>
<td>.742</td>
<td>35</td>
<td>.463</td>
</tr>
<tr>
<td>19</td>
<td>Each step from production to consumption adds value to agricultural products.</td>
<td>2.11/1.73</td>
<td>.95/.79</td>
<td>1.189</td>
<td>35</td>
<td>.243</td>
</tr>
<tr>
<td>24</td>
<td>Food exports are the number one income source for America in the world market.</td>
<td>2.58/2.36</td>
<td>.95/.67</td>
<td>.677</td>
<td>35</td>
<td>.503</td>
</tr>
<tr>
<td>29</td>
<td>Governments work to ensure that the food and fiber market system operates efficiently and provides stability to the market.</td>
<td>2.31/2.18</td>
<td>.79/.87</td>
<td>.430</td>
<td>35</td>
<td>.670</td>
</tr>
<tr>
<td>34</td>
<td>Government policies with respect to agriculture are the result of political action groups or individuals.</td>
<td>2.04/1.82</td>
<td>.66/.60</td>
<td>.948</td>
<td>35</td>
<td>.349</td>
</tr>
<tr>
<td>39</td>
<td>International supply and demand influences the types and quality of products produced and traded around the world.</td>
<td>1.38/1.45</td>
<td>.57/.52</td>
<td>-.349</td>
<td>35</td>
<td>.729</td>
</tr>
</tbody>
</table>
Table 17. T tests for Townsend, subcategory 4, Business and Economics.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Agricultural exports are a significant component of US foreign trade.</td>
<td>1.56/1.67</td>
<td>.73/.71</td>
<td>-.329</td>
<td>16</td>
<td>.747</td>
</tr>
<tr>
<td>9</td>
<td>The import and export of agricultural commodities is a major concern of foreign policy makers.</td>
<td>2.67/1.78</td>
<td>1.22/1.97</td>
<td>1.706</td>
<td>16</td>
<td>.107</td>
</tr>
<tr>
<td>14</td>
<td>The food and fiber system involves a production continuum that extends from local farms to factories, markets and tables in every region of the globe.</td>
<td>1.22/1.11</td>
<td>.44/.33</td>
<td>.603</td>
<td>16</td>
<td>.555</td>
</tr>
<tr>
<td>19</td>
<td>Each step from production to consumption adds value to agricultural products.</td>
<td>1.78/1.44</td>
<td>.83/.53</td>
<td>1.014</td>
<td>16</td>
<td>.326</td>
</tr>
<tr>
<td>24</td>
<td>Food exports are the number one income source for America in the world market.</td>
<td>2.67/2.33</td>
<td>.87/.87</td>
<td>.816</td>
<td>16</td>
<td>.426</td>
</tr>
<tr>
<td>29</td>
<td>Governments work to ensure that the food and fiber market system operates efficiently and provides stability to the market.</td>
<td>2.56/2.44</td>
<td>1.13/1.01</td>
<td>.220</td>
<td>16</td>
<td>.829</td>
</tr>
<tr>
<td>34</td>
<td>Government policies with respect to agriculture are the result of political action groups or individuals.</td>
<td>2.00/2.00</td>
<td>1.00/.71</td>
<td>.000</td>
<td>16</td>
<td>1.000</td>
</tr>
<tr>
<td>39</td>
<td>International supply and demand influences the types and quality of products produced and traded around the world.</td>
<td>1.67/1.56</td>
<td>.50/.53</td>
<td>.459</td>
<td>16</td>
<td>.653</td>
</tr>
</tbody>
</table>
Table 18. *T* tests for three schools combined, subcategory 4, Business and Economics.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Agricultural exports are a significant component of US foreign trade.</td>
<td>1.54/1.41</td>
<td>.69/.56</td>
<td>.889</td>
<td>88</td>
<td>.376</td>
</tr>
<tr>
<td>9</td>
<td>The import and export of agricultural commodities is a major concern of foreign policy makers.</td>
<td>2.00/1.50</td>
<td>.91/.71</td>
<td>2.729</td>
<td>88</td>
<td>.008 *</td>
</tr>
<tr>
<td>14</td>
<td>The food and fiber system involves a production continuum that extends from local farms to factories, markets and tables in every region of the globe.</td>
<td>1.48/1.26</td>
<td>.60/.51</td>
<td>1.827</td>
<td>78.632</td>
<td>.072</td>
</tr>
<tr>
<td>19</td>
<td>Each step from production to consumption adds value to agricultural products.</td>
<td>2.16/1.76</td>
<td>.91/.78</td>
<td>2.108</td>
<td>88</td>
<td>.038 *</td>
</tr>
<tr>
<td>24</td>
<td>Food exports are the number one income source for America in the world market.</td>
<td>2.71/2.26</td>
<td>.95/.79</td>
<td>2.318</td>
<td>88</td>
<td>.023 *</td>
</tr>
<tr>
<td>29</td>
<td>Governments work to ensure that the food and fiber market system operates efficiently and provides stability to the market.</td>
<td>2.46/2.26</td>
<td>.93/.93</td>
<td>.984</td>
<td>88</td>
<td>.328</td>
</tr>
<tr>
<td>34</td>
<td>Government policies with respect to agriculture are the result of political action groups or individuals.</td>
<td>2.00/1.94</td>
<td>.76/.69</td>
<td>.367</td>
<td>88</td>
<td>.715</td>
</tr>
<tr>
<td>39</td>
<td>International supply and demand influences the types and quality of products produced and traded around the world.</td>
<td>2.00/1.94</td>
<td>.76/.69</td>
<td>.367</td>
<td>88</td>
<td>.715</td>
</tr>
</tbody>
</table>
Tables 19 through 22 show the t-tests for items that pertain to "Health, Food and Nutrition". Table 19 contains data from Yale, Table 20 shows data from Woodland, Table 21 presents data from Townsend, and Table 22 contains a composite of data from all three schools. No t-scores were found to be significant at the .05 level, meaning that there were no significant changes between the pretest and posttest responses to individual items that dealt with health, food and nutrition.

Table 19. T tests for Yale, subcategory 5. Health Food and Nutrition.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Food safety is a growing concern for consumers.</td>
<td>1.19/1.21</td>
<td>.40/.43</td>
<td>-.168</td>
<td>33</td>
<td>.868</td>
</tr>
<tr>
<td>10</td>
<td>Information shapes our opinion about food.</td>
<td>1.14/1.07</td>
<td>.36/.27</td>
<td>.636</td>
<td>33</td>
<td>.529</td>
</tr>
<tr>
<td>15</td>
<td>Information shapes our opinion about food.</td>
<td>1.86/1.57</td>
<td>.91/.51</td>
<td>1.064</td>
<td>33</td>
<td>.295</td>
</tr>
<tr>
<td>20</td>
<td>The major food groups are important to feeling healthy.</td>
<td>1.10/1.12</td>
<td>.30/.43</td>
<td>-.971</td>
<td>33</td>
<td>.339</td>
</tr>
<tr>
<td>25</td>
<td>Primary nutrients are important to healthy eating.</td>
<td>1.43/1.29</td>
<td>.51/.47</td>
<td>.841</td>
<td>33</td>
<td>.406</td>
</tr>
<tr>
<td>30</td>
<td>Education about nutrition research findings affect consumer demand for specific foods.</td>
<td>1.76/1.64</td>
<td>.83/.63</td>
<td>.454</td>
<td>33</td>
<td>.652</td>
</tr>
<tr>
<td>35</td>
<td>When people are physically active, their bodies use more calories than when resting.</td>
<td>1.33/1.14</td>
<td>.48/.36</td>
<td>1.329</td>
<td>32.429</td>
<td>.193</td>
</tr>
<tr>
<td>40</td>
<td>Exercise is important in the lives of children.</td>
<td>1.05/1.00</td>
<td>.22/.00</td>
<td>.812</td>
<td>33</td>
<td>.422</td>
</tr>
</tbody>
</table>
Table 20. T tests for Woodland, subcategory 5. Health, Food and Nutrition.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pre/post)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Food safety is a growing concern for consumers.</td>
<td>1.46/1.55</td>
<td>.58/.69</td>
<td>-.380</td>
<td>35</td>
<td>.706</td>
</tr>
<tr>
<td>10</td>
<td>Information shapes our opinion about food.</td>
<td>1.27/1.64</td>
<td>.45/1.21</td>
<td>-.981</td>
<td>11.210</td>
<td>.347</td>
</tr>
<tr>
<td>15</td>
<td>Information shapes our opinion about food.</td>
<td>1.65/2.00</td>
<td>.63/1.34</td>
<td>-.819</td>
<td>11.904</td>
<td>.429</td>
</tr>
<tr>
<td>20</td>
<td>The major food groups are important to feeling healthy.</td>
<td>1.50/1.27</td>
<td>.58/.47</td>
<td>1.144</td>
<td>35</td>
<td>.260</td>
</tr>
<tr>
<td>25</td>
<td>Primary nutrients are important to healthy eating.</td>
<td>1.42/1.36</td>
<td>.58/.50</td>
<td>.296</td>
<td>35</td>
<td>.769</td>
</tr>
<tr>
<td>30</td>
<td>Education about nutrition research findings affect consumer demand for specific foods.</td>
<td>1.77/1.73</td>
<td>.59/.65</td>
<td>.193</td>
<td>35</td>
<td>.848</td>
</tr>
<tr>
<td>35</td>
<td>When people are physically active, their bodies use more calories than when resting.</td>
<td>1.08/1.36</td>
<td>.39/.50</td>
<td>-1.682</td>
<td>15.366</td>
<td>.113</td>
</tr>
<tr>
<td>40</td>
<td>Exercise is important in the lives of children.</td>
<td>1.04/1.18</td>
<td>.34/.60</td>
<td>-.918</td>
<td>35</td>
<td>.365</td>
</tr>
</tbody>
</table>
Table 21. T tests for Townsend, subcategory 5, Health Food and Nutrition.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Food safety is a growing concern for consumers.</td>
<td>1.22/1.11</td>
<td>.44/.33</td>
<td>.603</td>
<td>16</td>
<td>.555</td>
</tr>
<tr>
<td>10</td>
<td>Information shapes our opinion about food.</td>
<td>1.22/1.11</td>
<td>.44/.33</td>
<td>.603</td>
<td>16</td>
<td>.555</td>
</tr>
<tr>
<td>15</td>
<td>Information shapes our opinion about food.</td>
<td>1.67/1.56</td>
<td>.71/.53</td>
<td>.378</td>
<td>16</td>
<td>.710</td>
</tr>
<tr>
<td>20</td>
<td>The major food groups are important to feeling healthy.</td>
<td>1.22/1.11</td>
<td>.44/.33</td>
<td>.603</td>
<td>16</td>
<td>.555</td>
</tr>
<tr>
<td>25</td>
<td>Primary nutrients are important to healthy eating.</td>
<td>1.33/1.22</td>
<td>.50/.44</td>
<td>.500</td>
<td>16</td>
<td>.624</td>
</tr>
<tr>
<td>30</td>
<td>Education about nutrition research findings affect consumer demand for specific foods.</td>
<td>1.89/1.67</td>
<td>.93/.50</td>
<td>.632</td>
<td>16</td>
<td>.536</td>
</tr>
<tr>
<td>35</td>
<td>When people are physically active, their bodies use more calories than when resting.</td>
<td>1.22/1.11</td>
<td>.44/.33</td>
<td>.603</td>
<td>16</td>
<td>.555</td>
</tr>
<tr>
<td>40</td>
<td>Exercise is important in the lives of children.</td>
<td>1.11/1.00</td>
<td>.33/.00</td>
<td>1.000</td>
<td>8.000</td>
<td>.347</td>
</tr>
</tbody>
</table>

Table 22. T tests for three schools combined, subcategory 5, Health Food and Nutrition.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean (pretest/posttest)</th>
<th>Standard Deviation (pre Post)</th>
<th>T</th>
<th>Df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Food safety is a growing concern for consumers.</td>
<td>1.32/1.29</td>
<td>.51/.52</td>
<td>.244</td>
<td>88</td>
<td>.808</td>
</tr>
<tr>
<td>10</td>
<td>Information shapes our opinion about food.</td>
<td>1.21/1.26</td>
<td>.41/.75</td>
<td>-.411</td>
<td>88</td>
<td>.682</td>
</tr>
<tr>
<td>15</td>
<td>Information shapes our opinion about food.</td>
<td>1.73/1.71</td>
<td>.75/.87</td>
<td>.151</td>
<td>88</td>
<td>.880</td>
</tr>
<tr>
<td>20</td>
<td>The major food groups are important to feeling healthy.</td>
<td>1.30/1.21</td>
<td>.50/.41</td>
<td>1.005</td>
<td>80.348</td>
<td>.318</td>
</tr>
<tr>
<td>25</td>
<td>Primary nutrients are important to healthy eating.</td>
<td>1.41/1.29</td>
<td>.53/.46</td>
<td>1.095</td>
<td>77.340</td>
<td>.277</td>
</tr>
<tr>
<td>30</td>
<td>Education about nutrition research findings affect consumer demand for specific foods.</td>
<td>1.79/1.68</td>
<td>.73/.59</td>
<td>.737</td>
<td>88</td>
<td>.463</td>
</tr>
<tr>
<td>35</td>
<td>When people are physically active, their bodies use more calories than when resting.</td>
<td>1.20/1.21</td>
<td>.44/.41</td>
<td>-.101</td>
<td>88</td>
<td>.920</td>
</tr>
<tr>
<td>40</td>
<td>Exercise is important in the lives of children.</td>
<td>1.05/1.06</td>
<td>.30/.34</td>
<td>-.077</td>
<td>88</td>
<td>.939</td>
</tr>
</tbody>
</table>
Table 23 contains t-tests from surveys regarding the 5 categories. Each category was represented in the survey by 8 items that pertained to it. Those 8 items were added up for each category, and t-tests were run on the totals. In the Table 23, the first column denotes the category. The second and fourth columns contain means of the totals for the eight items in each category. The third and fifth columns show the standard deviations of the means of the categories. The sixth column contains the t-statistic for each of the five categories. The seventh column depicts the degrees of freedom, and the eighth column presents the two-tailed significance for each corresponding t-score.

The data in Table 23 reveal that there were significant changes, pretest and posttest, in the responses to items that dealt with “Historical Geographical and Cultural Significance” at Yale (.038) and in the total (three schools combined) (.026). In the area of “Science: Food and Fiber – Environmental Interdependence” there is a significant difference in pretest and posttest responses at Yale (.005), Woodland (.040), and in the Total category (.000). A significant difference was also found in “Business and Economics” at Yale (.038) and in the Total (.012). All t-scores are positive for these categories showing significance, meaning that the respondents in general more strongly agreed with the items in those categories in the posttest when compared to the pretest.
Table 23. T-tests for 5 categories

<table>
<thead>
<tr>
<th>Subject</th>
<th>Pretest Mean</th>
<th>Pretest St. Dev.</th>
<th>Posttest Mean</th>
<th>Posttest St. Dev.</th>
<th>t</th>
<th>Df</th>
<th>Sig. (two tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Understanding Agriculture</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Townsend</td>
<td>24.33</td>
<td>3.81</td>
<td>25.67</td>
<td>2.29</td>
<td>-.900</td>
<td>16</td>
<td>.381</td>
</tr>
<tr>
<td>Yale</td>
<td>25.05</td>
<td>2.01</td>
<td>24.07</td>
<td>1.59</td>
<td>1.523</td>
<td>33</td>
<td>.137</td>
</tr>
<tr>
<td>Woodland</td>
<td>25.12</td>
<td>3.37</td>
<td>25.45</td>
<td>2.46</td>
<td>-.300</td>
<td>35</td>
<td>.766</td>
</tr>
<tr>
<td>Total</td>
<td>24.96</td>
<td>2.97</td>
<td>24.94</td>
<td>2.16</td>
<td>.039</td>
<td>88</td>
<td>.969</td>
</tr>
<tr>
<td><strong>Historical, Geographical and Cultural Significance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Townsend</td>
<td>17.00</td>
<td>2.87</td>
<td>16.22</td>
<td>3.03</td>
<td>.559</td>
<td>16</td>
<td>.584</td>
</tr>
<tr>
<td>Yale</td>
<td>18.62</td>
<td>5.03</td>
<td>15.57</td>
<td>1.87</td>
<td>2.159</td>
<td>33</td>
<td>.038 *</td>
</tr>
<tr>
<td>Woodland</td>
<td>16.73</td>
<td>2.51</td>
<td>15.91</td>
<td>2.51</td>
<td>.911</td>
<td>35</td>
<td>.368</td>
</tr>
<tr>
<td>Total</td>
<td>17.48</td>
<td>3.75</td>
<td>15.85</td>
<td>2.36</td>
<td>2.271</td>
<td>88</td>
<td>.026 *</td>
</tr>
<tr>
<td><strong>Science: Food and Fiber-Environmental Interdependence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Townsend</td>
<td>17.22</td>
<td>2.95</td>
<td>14.78</td>
<td>2.73</td>
<td>.747</td>
<td>16</td>
<td>.466</td>
</tr>
<tr>
<td>Yale</td>
<td>16.38</td>
<td>2.87</td>
<td>13.57</td>
<td>2.47</td>
<td>2.992</td>
<td>33</td>
<td>.005 *</td>
</tr>
<tr>
<td>Woodland</td>
<td>16.62</td>
<td>2.97</td>
<td>14.18</td>
<td>3.66</td>
<td>2.128</td>
<td>35</td>
<td>.040 *</td>
</tr>
<tr>
<td>Total</td>
<td>16.63</td>
<td>2.89</td>
<td>14.08</td>
<td>2.91</td>
<td>4.024</td>
<td>88</td>
<td>.000 *</td>
</tr>
<tr>
<td><strong>Business and Economics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Townsend</td>
<td>16.11</td>
<td>4.70</td>
<td>14.33</td>
<td>3.61</td>
<td>.900</td>
<td>16</td>
<td>.381</td>
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<tr>
<td>Yale</td>
<td>16.81</td>
<td>4.24</td>
<td>13.86</td>
<td>3.48</td>
<td>2.162</td>
<td>33</td>
<td>.038 *</td>
</tr>
<tr>
<td>Woodland</td>
<td>15.12</td>
<td>2.80</td>
<td>13.55</td>
<td>3.50</td>
<td>1.445</td>
<td>35</td>
<td>.157</td>
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<td>Total</td>
<td>15.91</td>
<td>3.73</td>
<td>13.88</td>
<td>3.43</td>
<td>2.576</td>
<td>88</td>
<td>.012 *</td>
</tr>
<tr>
<td><strong>Food, Health and Nutrition</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Townsend</td>
<td>10.89</td>
<td>3.10</td>
<td>9.89</td>
<td>1.69</td>
<td>.849</td>
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<td>.408</td>
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<td>Yale</td>
<td>10.86</td>
<td>2.03</td>
<td>10.14</td>
<td>1.41</td>
<td>1.143</td>
<td>33</td>
<td>.261</td>
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<tr>
<td>Woodland</td>
<td>13.84</td>
<td>1.83</td>
<td>12.09</td>
<td>3.27</td>
<td>1.673</td>
<td>12.725</td>
<td>.119</td>
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</table>

* denotes significance at the .05 level.
The data in Table 24 presents the results of an Analysis of Variance (ANOVA) calculated for the three schools on the five categories for both the pretest and the posttest survey data. The only category that was significant at the alpha level of .05 was the Food, Health and Nutrition category in the pretest (.000). This means that there is a significant difference among one or more of the schools in the Food, Health and Nutrition category.

Table 24. **ANOVA of the composite scores for 5 categories.**

<table>
<thead>
<tr>
<th>Category</th>
<th>PRETEST</th>
<th>POSTTEST</th>
<th></th>
<th></th>
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<tr>
<td></td>
<td>Sum of Squares</td>
<td>Df</td>
<td>F</td>
<td>Sig.</td>
<td>Sum of Squares</td>
<td>Df</td>
<td>F</td>
<td>Sig.</td>
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<td>Understanding Agriculture</td>
<td>Bet. Groups</td>
<td>4.3</td>
<td>2</td>
<td>.238</td>
<td>18.2</td>
<td>2</td>
<td>.000 *</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Within Groups</td>
<td>481.6</td>
<td>53</td>
<td>.789</td>
<td>135.7</td>
<td>31</td>
<td>.142</td>
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<td></td>
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<tr>
<td></td>
<td>Total</td>
<td>485.9</td>
<td>55</td>
<td></td>
<td>153.9</td>
<td>33</td>
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<tr>
<td>Historical, Geographical and Cultural</td>
<td>Bet. Groups</td>
<td>43.9</td>
<td>2</td>
<td>1.594</td>
<td>2.4</td>
<td>2</td>
<td>.202</td>
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<tr>
<td>Significance</td>
<td>Within Groups</td>
<td>730.1</td>
<td>53</td>
<td>.213</td>
<td>181.9</td>
<td>31</td>
<td>.818</td>
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<tr>
<td></td>
<td>Total</td>
<td>774.0</td>
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<td></td>
<td>184.3</td>
<td>33</td>
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<td>Science: Food and Fiber-Environmental</td>
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<td>.274</td>
<td>8.1</td>
<td>2</td>
<td>.461</td>
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<tr>
<td>Interdependence</td>
<td>Within Groups</td>
<td>454.7</td>
<td>53</td>
<td>.762</td>
<td>272.6</td>
<td>31</td>
<td>.635</td>
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<tr>
<td></td>
<td>Total</td>
<td>459.4</td>
<td>55</td>
<td></td>
<td>280.7</td>
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<tr>
<td>Business and Economics</td>
<td>Bet. Groups</td>
<td>33.8</td>
<td>2</td>
<td>1.221</td>
<td>3.1</td>
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<td>Within Groups</td>
<td>732.8</td>
<td>53</td>
<td>.303</td>
<td>384.4</td>
<td>31</td>
<td>.883</td>
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<td>Total</td>
<td>766.6</td>
<td>55</td>
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<td>387.5</td>
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<td>Food, Health and Nutrition</td>
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<td>31.5</td>
<td>2</td>
<td>.3.144</td>
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<td></td>
<td>Within Groups</td>
<td>242.8</td>
<td>53</td>
<td>.000 *</td>
<td>155.5</td>
<td>31</td>
<td>.0.57</td>
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<td></td>
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<tr>
<td></td>
<td>Total</td>
<td>366.5</td>
<td>55</td>
<td></td>
<td>187.1</td>
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</table>
Focus Group Interviews

For each question in the interviews, the responses have been compiled and are included in Appendix C. The responses noted in the narrative below were elicited at a minimum of two of the schools.

Mid-Year Interview

Question A1 examined how the local community had reacted to the school's involvement in the Food and Fiber Literacy project. Respondents indicated that the local communities were very positive, with the exception of Woodland, where it was noted that the community had not been very involved. For the text of the question and specific responses at each school, refer to Appendix C.

Question A2 asked about the major benefits and shortcomings of the Food and Fiber Literacy project. A benefit that was mentioned at all of the schools was that the project helped teachers and students become more aware of agriculture in their area, and helped them connect it to their lives. Teachers reported that they had problems with the technology (e-mail and INTERNET) and communicating with project coordinators through this technology. It was also suggested that more lessons would be helpful, especially lessons that would relate better to students from a different culture.

Question A3 was intended to determine where teachers were finding support in their communities. Many local agricultural groups were mentioned, along with government agencies such as the Extension service and the Forest Service. Schools also
mentioned that they had used nearby universities and called on parents to help out more often.

Question B1 inquired why the teachers got involved in the project. Personal interest in the project and community connections to agriculture were responses at more than one of the schools.

Question B2 sought information on results that were evident because of the Food and Fiber Literacy project at each school. Teachers reported that students and parents seemed to be more interested in the lessons, and that the students were making more connections between agriculture and their coursework and their own lives.

Question B3 asked what connections teachers had made between the Food and Fiber Systems Framework and their day-to-day instruction. One recurring response was that the framework helped the teachers make the connections between the lessons and things that students experience in everyday life.

Question B4 asked teachers to rate the quality of the instructional materials that were a part of the Food and Fiber Literacy project. All schools agreed that the materials were easy to use, and were in a format that was easy for teachers to apply in the classroom. The background information was found to be very helpful, though it was mentioned that some lessons needed more background information.

Question C1 inquired how the project had positively and negatively impacted learners. Teachers responded that student involvement had increased, and the parents
were more involved than before. One concern was that it took more time and energy for
the teachers to learn the new lessons and to research background information.

Question D1 asked what impact the Food and Fiber Systems Literacy project will
have on teaching strategies in the future. Teachers thought that they would be more apt
to talk to each other about lessons, and depend on each other for input. Most teachers
also said that they would probably continue teaching some Food and Fiber lessons in the
future.

Question D2 sought information about specific components of the project teachers
thought they would use in the future. One lesson that was mentioned more than once was
the lesson entitled “Next Year’s Seeds.” Several other lessons were mentioned as well.

Question E1 asked how the Food and Fiber project had impacted the schools’
local curriculum goals. Every school responded that the project had helped them
integrate the curriculum, and made them aware of how agriculture could help tie
different core subjects together.

Question F1 asked teachers to suggest reasons for their neighboring schools to
either adopt or not adopt the Food and Fiber Systems Literacy Framework. Teachers
mentioned that the framework made it easier to integrate curriculum and to help students
see connections between school lessons and real life. Responses also included that it was
easy to use more hands-on activities and that it would help students in urban areas
appreciate the rural parts of the nation.
Question F2 asked teachers what reasons they would give for adopting the Food and Fiber Systems Literacy Framework as a statewide initiative. Teachers said that the framework would help the state meet curriculum and integration goals. They also responded that the framework would be very inexpensive to adopt, and that it would appeal to the agriculture community, since it helps students develop a strong understanding of agriculture.

End-of-Year Interviews

Question 1 followed up on question A3 from the mid year interviews, requesting teachers to add to the list of groups that they have worked with in relation to the Food and Fiber Literacy project. Extension and universities were mentioned again, along with several community organizations.

Question 2 inquired about the impact that the Food and Fiber project has had on each of the three schools. All schools said that they were able to advance their technology and their computer skills as a result of the project. Teachers also responded that they acquired new resources and contacts in their community. Teachers and students acquired a better awareness of agriculture in their community and teachers felt more comfortable teaching food and fiber concepts.

Question 3 asked how the Food and Fiber Systems Literacy project has impacted the way teachers approach lessons. The major change noted was that teachers were more
aware of the interrelationships between agriculture and core subjects, and how agriculture can be used to tie core subjects together.

Question 4 sought information about the impacts of the Food and Fiber project on student learning. Teachers responded that students seemed to be more aware of nature and natural processes, such as the food chain and how dependent we are on the earth. Students have also showed more interest and are making more real life connections in their lessons.

Question 5 requested information about how teachers had challenged students differently as a result of the Food and Fiber Literacy project. Teachers responded that students were expected to engage in more discussion and to be more involved in the learning process.

Question 6 asked if teachers had been more involved in deciding what to teach as a result of the Food and Fiber project. Teachers responded that they weren’t necessarily more involved, but had more options with the extra lessons from the Food and Fiber project.

Question 7 asked if teachers collaborated with each other more when deciding what lessons to teach. Teachers reported that there was more cooperation across grades, and that there was some discussion on what lessons to teach.

Question 8 inquired about conflicts between the Food and Fiber lessons and preparing students for achievement tests. Teachers responded that there was no conflict.
between Food and fiber lessons and preparing for achievement tests. They mentioned that the lessons went very well with existing curriculum.

Question 9 sought information regarding the satisfaction teachers received from teaching. At all three schools, participants reported that they got more satisfaction from teaching with the Food and Fiber lessons, though the paperwork involved with the project was frustrating.

Question 10 asked if teachers would embrace the idea of infusing more food and fiber themes and concepts. Teachers responded very positively to the idea, especially with additional lessons to choose from.

Question 11 inquired about how teachers were challenged to make connections to the Food and Fiber framework. Teachers responded that they were required to think about the lessons more, and cited several specific examples. Refer to Appendix X for the specific examples.

Question 12 asked if teachers thought that education about the food and fiber industry was genuinely important to the students. At all three schools, teachers said that they do see food and fiber literacy as important to the students, especially to help them appreciate agriculture and how dependent they are on rural areas in their daily lives.

Question 13 sought information about how each of the three schools has changed because of the Food and Fiber Literacy project. Teachers reported that they were approaching lessons differently, with more discussion and with more cooperation
between teachers. They also mentioned that they were able to use more technology, and were more comfortable with modern technology.

Question 14 asked what teachers did not teach that they did teach last year. All three schools reported that there was nothing left out because of their involvement with the Food and Fiber project.

Question 15 sought information about what motivated teachers to infuse Food and Fiber concepts into their lessons. The major motivating factor was how much the students and community were excited about the project and the lessons.

Question 16 inquired about how preparing for a Food and Fiber lesson was different from preparing for a traditional lesson. Teachers responded that, in general, it was easier since the lessons were well laid out, but it did require more research and they often had to spend time gathering materials for the lessons.

Question 17 asked teachers what they learned from being involved in the Food and Fiber Literacy project. Teachers said they had a heightened awareness of agriculture and the wide-ranging effect that it has on their lives. They were relating many of their current lesson to agriculture, and had learned to use more hands-on activities in their teaching. It was also mentioned that teachers felt much more comfortable with technology that they were required to use during the project.

Question 18 asked if anything teachers covered in the classroom piqued their interest for further study. Several specific examples were given. Refer to Appendix C for these examples.
Question 19 sought information about the workload of the teachers involved in the Food and Fiber project. Teachers said that, except for the extra research involved with the lessons, they didn’t have an extraordinary workload.

Question 20 asked teachers to name five things that were important at their school. All three schools thought that education and academic excellence and the wellbeing of the students was important.

Question 21 inquired about the involvement and importance of the site coordinators and administrators in the Food and Fiber Literacy project. Teachers said that site coordinators and other teachers created a support system to remind them to finish paperwork and to work through any problems with lessons.

Question 22 sought information about how teachers received feedback on the Food and Fiber Literacy project. Most feedback was received from the project administrators and from other teachers. The feedback from the community was very positive.

Question 23 inquired about when and with whom teachers shared their experiences with the Food and Fiber Literacy project. Teachers reported that the most meaningful times were informally among teachers and through community projects.

Question 24 asked if teachers had a chance to contribute to meaningful changes to the Food and Fiber project at their school. Teachers responded that they contributed through communicating with administrators by email and turning in written reports.
Question 25 sought information about what events encouraged teachers to infuse Food and Fiber lessons into the curriculum. Administrators and site coordinators were very important to the teachers to motivate them to participate in the project.

Question 26 asked what kind of feedback and support teachers received from students when they were teaching Food and Fiber concepts. Students seemed to be more attentive in class and seemed to retain more knowledge after the lessons. Teachers also noted that students were starting to make their own connections between their schoolwork and their actual lives. It was mentioned that classroom participation and discussion was also more frequent.

Question 27 inquired about the amount of work expected of the project teachers. All three schools mentioned there was a substantial amount of paperwork associated with the project and the amount of time and effort it took to complete it.
CHAPTER FIVE

CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

The purpose of this study was to determine the change in attitudes toward the food and fiber system and toward the implementation of the Food and Fiber Systems Literacy Framework in their respective schools. Results are based on teacher responses to a 40-item survey instrument, and focus group interviews conducted at schools participating in the Food and Fiber Literacy project. The population for this quasi-experimental one-group pretest-posttest (Gall, Borg & Gall, 1996) study included teachers who voluntarily participated in the project at the three test schools in Yale, Oklahoma; Woodland, California; and Townsend, Montana.

To fulfill the purpose of this study, teachers were surveyed and focus group interviews were conducted in order to meet the following objectives:

1. Determine the effects of the Food and Fiber Systems Literacy project on the participating teachers’ attitudes and perceptions about agriculture.

2. Assess teachers’ perceptions about how the Food and Fiber Systems Literacy project has affected students, classrooms and their teaching.

3. Assess teachers’ perceptions about how the Food and Fiber Systems Literacy project has impacted their communities, schools and student engagement and achievement.
Conclusions

After analyzing the survey results and the focus group interview responses, the following conclusions were drawn:

1. Based on responses in the mid-year and end-of-year focus group interviews, teachers found the Food and Fiber Systems Literacy Framework usable and lessons to be easily combined with existing curriculum.

2. Based on data in Table 23, the Food and Fiber Systems Literacy project affected teachers’ attitudes and perceptions toward agriculture in the following areas: (1) Historical, Geological and Cultural Significance; (2) Science: Food and Fiber - Environmental Interdependence; and (3) Business and Economics.

3. Based on responses in the end-of-year focus group interviews, teachers in the project were more consciously aware of agriculture and the food and fiber system in their communities as a result of participating in the project.

4. Based on responses in the end-of-year focus group interviews, teachers feel that participating in the Food and Fiber project has improved student engagement and participation in the classroom.

5. Based on responses in the mid-year and end-of-year focus group interviews, the Food and Fiber Literacy project increased the teachers’ and students’ access to technology and their computer literacy skills.
6. Based on responses in the mid-year and end-of-year focus group interviews, participating in the Food and Fiber Literacy project helped teachers and schools involve members of the local community in helping to educate their students.

7. Based on responses in the mid-year and end-of-year focus group interviews, teachers noticed that students were relating more of their schoolwork to their everyday lives as a result of the Food and Fiber Literacy project.

Implications

The data collected in this study allowed the researcher to make the following implications:

1. Programs interested in promoting food and fiber concepts, such as Agriculture In The Classroom, could evaluate the Food and Fiber Systems Literacy Framework and lessons as a way to provide structure to lessons and help integrate agriculture into curriculum in kindergarten through the eighth grade.

2. The Food and Fiber Systems Literacy Framework could be used to help states meet integration and curriculum goals.

Recommendations

The following recommendations are offered for consideration in further study, development and use of the Food and Fiber Systems Literacy Framework:

1. More lessons should be developed to give teachers more variety in their teaching to avoid repeating lessons.
2. Reporting procedures involved in similar projects should be simplified, since paperwork was the major complaint expressed by the teachers involved in the focus group interviews about the Food and Fiber project.

3. The researcher recommends further study to determine if the teachers participating in the Food and Fiber Systems Literacy project have continued to integrate agriculture into their curriculum and use Food and Fiber lessons after the test period has been completed.

4. Efforts should be made to implement the Food and Fiber Literacy Framework on a broader scale. State initiatives to make the materials developed in this project available to all public schools would be an effective way of fulfilling this recommendation.

5. The researcher recommends that food and fiber concepts be integrated into the curriculum at the high school level, in addition to the kindergarten through eighth grade studied here.
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Knowledge and Perception of Agriculture. A paper presented at the 21st annual
National Agricultural Education Research Meeting. (pp.121-127) Dallas, Texas


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APPENDIX A

SURVEY INSTRUMENT
Food and Fiber Systems
Literacy project

Instructions

This survey is a product of the National Food and Fiber Systems Literacy project. This survey is comprised of two sections. Section I relates to the Food and Fiber Literacy framework. Section II requests demographic information about respondents.

This pilot study is designed to provide you the opportunity to express your opinions about our Food and Fiber Systems.

By completing this survey you are helping the researchers determine the reliability and the usability of this instrument.

Take time to fill out each and every question since your responses are important to us.

Please do not record your name or address. All answers will be strictly confidential, results will be reported in groups only. Please do not omit any answers.

Directions: Read each statement and mark between the parentheses under your selection. The following choices are available.

1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

Thank You
Section I

1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

1. Agriculture involves the management of forests, and their natural products.  
2. Food availability plays a key role in contemporary civilization.  
3. Innovations have helped solve problems related to many aspects of the food and fiber system.  
4. Agricultural exports are a significant component of U.S. foreign trade.  
5. Food safety is a growing concern for consumers.  
6. Human ingenuity has solved numerous problems involved in the production, storage, and preparation of food.  
7. Many important historical figures, inventions, and events have emerged as a result of our constant search for the certainty of food.  
8. The vitality of the Food and Fiber system now and in the future depends on public understanding of this interdependence.  
9. The import and export of agricultural commodities is a major concern of foreign policy makers.
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<td>5</td>
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</tr>
<tr>
<td></td>
<td>= Strongly Agree</td>
<td>Agree</td>
<td>Neutral</td>
<td>Disagree</td>
<td>= Strongly Disagree</td>
</tr>
</tbody>
</table>

10. A variety of food is good for providing a balanced diet.  

11. The Food and Fiber system is not an integral part of most state’s economy.  

12. Civilization’s advancements have nothing to do with agricultural development.  

13. Geographic location, climate, and soil type generally determine the quantity and diversity of species within an ecosystem.  

14. The food and fiber system involves a production continuum that extends from local farms to factories, markets, and tables in every region of the globe.  

15. Information shapes our opinion about food.  

16. Global market forces affect supply and demand for agricultural products.  

17. Agricultural trade stimulated the development of measurement, accounting, and written communication.  

18. Production within the Food and Fiber system contributes to the depletion of resources.
1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

19. Each step from production to consumption adds value to agricultural products.
20. The major food groups are important to healthy eating.
21. The Food and Fiber system does not constitute a significant number of jobs in the U.S.
22. Agriculture’s use of natural resources and its effect on the environment draws concern from people in every society.
23. Food Production Systems, when designed to work with the environment, can reverse the effects of pollution.
24. Food exports are the number one income source for America in the world market.
25. Primary nutrients are important factors to healthy eating.
26. A larger world population has no effect on the demand for agricultural products.
27. Historically, climate and geography have determined the plants and animals that grow best in a certain region.
28. The food and fiber system is dependent on non-renewable resources.
1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

29. Governments work to insure that the food and fiber market system operates efficiently and provides stability to the market.

30. Informing the public about nutritional information affects consumer demand for specific foods.

31. Agricultural food production has kept pace with our world population growth.

32. Plant varieties and animal breeds developed in the U.S. have changed eating habits in many other places of the world.

33. Food and Fiber systems rely on research from many scientific fields.

34. Government policies with respect to agriculture are the result of political action by groups or individuals.

35. When people are physically active, their bodies use more calories than when resting.

36. Agriculture is not a very large industry in America.

37. Some societal issues are directly related to the food and fiber system.

38. Scientific research has benefited the food and fiber industry.
Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

39. International supply and demand influence the types and quality and quantity of products produced and traded around the world.

40. Exercise is important in the lives of children.
APPENDIX B

DEMOGRAPHICS SECTION
Section II

Directions: Read each statement in this section completely. Circle the most accurate response to each statement and circle.

41. What is your age?
   a. 21-30 years
   b. 31-40 years
   c. 41-50 years
   d. 51-60 years
   e. over 60 years

42. Gender
   a. Female
   b. Male

43. Did you grow up?
   a. in town/city (a population greater than 50,000)
   b. in a suburb (2500-50,000 people)
   c. in a rural area (Less than 2500 people)
   d. on a farm or ranch

44. If you live on a farm or ranch, how many acres are included?
   A. 10-50 acres
   B. 51-500 acres
   C. 501-1000 acres
   D. Over 1000 acres

45. What is the population of the town closest to your home?
   A. Under 1000
   B. 1001-2500
   C. 2501-10,000
   D. 10,001-100,000
   E. Over 100,000

46. What state do you reside in and how long have you lived there?

47. How many years of experience do you have in teaching?
   a. 0-5 years
   b. 6-10 years
   c. 11-15 years
   d. 16-20 years
   e. 21 plus years

48. The area of education I most closely associate myself with is education?
   a. Elementary
   b. Middle School
   c. Secondary

49. What is your Bachelor's degree in?

50. What is your highest degree or certification earned?

53. What kind of special endorsement do you have? (i.e., Special Education, Early childhood, Gifted/talented, etc.)
54. Have you received any training to conduct inservice training?  
   a. YES   b. NO

55. Do you have relatives who live or work on a farm and/or ranch?  
   a. YES   b. NO

56. Do you have relatives who work in a non-production agricultural business?  
   a. YES   b. NO

57. Did you take agricultural courses in high school or college?  
   a. YES   b. NO

58. Were you a member of FFA and/or 4-H?  
   a. YES   b. NO

59. Where do you get most of your information regarding the Food and Fiber System?

60. Rate the following issues you believe our Nation’s Food and Fiber system currently faces.  
   (1 = most critical to address; 6 = least critical to address)
   ______ food safety
   ______ animal welfare
   ______ agricultural practices that affect the environment
   ______ viability of our rural economic base
   ______ conservation of our natural resource base
   ______ current government economic policies that impact agricultural production

61. What professional organizations are you affiliated with?

62. What types of community involvement are you associated with (i.e., Church, Boys’ or Girls’ Club)
APPENDIX C

TEACHER FOCUS GROUP INTERVIEWS AT
THREE FOOD AND FIBER
LITERACY PROJECT SCHOOLS
MID YEAR INTERVIEWS

TOWNSEND FOOD AND FIBER LITERACY TEACHERS RESPONSES

A1: Since your school was selected as a Food and Fiber Systems Literacy site, how has the community reacted to the project? What are some specific examples?

It has been Positive with those who aware of it in the community.
There have been offers from farms and ranches to come and visit their operations and volunteering to come in, along with supplying materials for class. 
Overall, economic improvement. Show kids where their roots are and the economic base of Montana.
Impressed with objectivity good portrayal to F&F trends

A2: What are the major benefits of the project from your perception? What are the major shortcomings (areas of improvement)?

Benefits
Money
Has made everyone more aware of how much agriculture they really taught.
The different links with training portion. (Research – resources)
Helped purchases needed supplies
Have made the teachers more computer literate
Has helped integrate the different subject matters
Has been a real eye-opener

Short comings
Need more communications between sites (e-mail exchange)
The teachers felt that they had to stretch some lesson plans to fit the framework, it was more background in nature than real nuts and bolts of a lesson plan.
More lessons in the lower grades – they felt there is a possibility of reteaching the same material.
The teachers were not sure if they were to specifically teach from the binder or if they found another lesson if they could use that.
The teachers were afraid that later on the kids would get taught twice, meaning the same lessons in a different grade level.
Internet access – all the different servers between teachers

A3: Have any groups emerged within your school or community to assist in any way with various aspects of the project?

Cattlewomen, Graingrowers, Local Extension Agent, Individual producers, The Local rep for Ag in Montana, U.S. Forest Service
B1: Why did you and/or your school site become involved in the Food and Fiber Systems project?

- Personal interest
- Community interest – Nature of the community
- Kids need to know how important it is to the community

B2: To this point, what results have you seen because of the F&F systems project?

- What products came from where, the students and teachers can trace the steps of the raw material to the grocery store.
- They realize the carryover of lesson plans.
- Students enjoys the lessons, keep asking when the nest F&F lesson is coming or if this is an F&F lesson.
- Lessons are worthwhile

B3: Give specific examples of ways that you have made connections between the Food and Fiber Systems framework and day-to-day instruction?

- Kindergarten instruction
- Eighth grade chemistry- Covalent bonding (Peanut brittle)
- Correlating all subjects to agriculture
- Careers and lifestyles

B4: How would you rate the quality of the Food and Fiber Systems instructional materials you have seen?

- Good background information for teachers especially those who do not have an agricultural background
- Want to see a greater number of activities especially in the lower grades
- There is more application than at the beginning.

C1: What have been the positive and negative impacts upon learners due to the Food and Fiber Systems project?

- Teachers feel that the parents may not know about what the students are involved with the project.
- The teachers realize how fragile the system really is. How vulnerable they really are when something (ag commodity or product) is missing? How many people (in the food chain) they really depend on.

D1: How will the Food and Fiber Systems project impact you teaching in coming years?

- Kids are eager to learn, asking when the next F&F lesson is.
Teachers need to depend on other teachers for building process (building blocks). Depends on team partners.

D2: What specific components of the Food and Fiber Systems Literacy would you be most likely to use in coming years?

7-8: Science related activities, such as “Next Year’s Seeds’
4-6: Plant related material
Nutrition
Import/Export (grade 6)
Longhorn (grade 5)
Peanut Butter (grade 5)
2-3: Tin Can Ice cream
Using more on the website
Tree parts
First: How wheat is grown (all related activities)
Little Red Hen
Kindergarten: Where the student’s snacks come from?

E1: How has the Food and Fiber Systems Literacy effort impacted your local curriculum goals?

Crossover of different curriculum
Helps the teachers meet different goals.
One thing needs to be improved: need to integrate music into framework lesson plans.

F1: What reasons would you give your neighboring school system for adopting or not adopting the Food and Fiber Systems Literacy framework?

Has enhanced the school and teachers’ relationship with local growers of the community.
There is more integration between teachers; teachers are together more often.

What if you were to be in a group from other states?
Urban sites can have an appreciation for rural areas
Applications are important
Practical applications are there to make a difference in the classroom

F2: What reasons would you give your state legislator or state superintendent of instruction for adopting or not adopting the Food and Fiber Systems Literacy framework as a statewide initiative?

This project is REVENUE NEUTRAL.
It expands the agriculture knowledge
Meets goals in the curriculum.
Framework makes it different from other curriculum, as it has structure, goals and not just lessons.
Serves as a catalyst for integration of curriculum
Makes a school's faculty work as a team instead of individuals.

**YALE, OKLAHOMA TEACHER INTERVIEWS**

1/19/98

A1: Since your school was selected as a Food and Fiber Systems Literacy site, how has the community reacted to the project? What are some specific examples?

Reaction of school, individuals to Food and Fiber program?
- Excited, Requesting of farm tours, apples, pumpkins, peanuts
- More individual reaction, as opposed to groups or industries
- Community very helpful
- Tours, things donated to schools for learning and for gardens
- Animals brought to school for students to learn about
- Put together a raised garden
- Hard to integrate ocean unit
- Aquarium and Dairy Goats from Langston
- 6th grade—Worm Farm
- 5th and 6th will put together Strawberry Tiered Garden for 3rd grade
- FFA advisor very helpful, animals on the farm
- Made Bread 6th grade paired with 2nd and first grade
- Went to OK City Omniplex, Zoo, Science Museum, etc.
- K washed animals at Fair.

A2: What are the major benefits of the project from your perception? What are the major shortcomings (areas of improvement)?

**Benefits students**
- Food doesn't just come from a grocery store, where food originates
- Wool comes from sheep, what their clothes are made of
- Appreciation of Conservation of natural resources, land suitable for growing food

**Benefits teachers**
- Eating a lot more fiber, more water, eating healthier
- Started recycling,
- Understanding of processing of raw materials
- Interdependence of all the areas of F&F industry, how they are tied together
- Lesson on Apples was great- 4th grade
- More aware of healthy lifestyle
- More aware of F&F and everything we do.

**Areas of improvement**
- Aware of agriculture's role in our society, involved in everything on some level

**Shortcomings**
- Frustration with computers
Communication between school and OSU
Sixth grade lesson plans difficult (math), had to adjust scenarios to fit communities.
Sometimes have to teach new concepts before lessons, build foundations.
Example: Geography at 3rd grade level.
Difficult to bring terminology back to kids level
Decimals, not started yet in 3rd grade,
Teachers need more help with terminology

A3: Have any groups emerged within your school or community to assist in any way with various aspects of the project.

Groups in your communities who have helped?
Newspapers, in Stillwater and Yale
Stillwater paper provide initial kickoff coverage of project at Yale

B1: Why did you and/or your school site become involved in the food & fiber systems project?

Practical, fits into life

B2: To this point, what results have you seen because of the F&F systems project?

Student and parent interest has increased
Greater awareness of nutrition, food groups
Students were made aware of supply and demand, tied in with advertising, etc.

B3: Give specific examples of ways that you have made connections between the Food and Fiber Systems framework and day-to-day instruction?

Meaningful to kids, part of everyday life
Kids see connection of this knowledge to their life
Community awareness
Integration of curriculum has been "stepped up a notch" due to F&F Project.

B4: How would you rate the quality of the Food and Fiber Systems instructional materials you have seen?

Materials are a small percentage of what teachers do (20%-50%)
Well organized, good background information, mostly very user friendly
Want more supplemental reading material
Want students to be able to get more involved
Terminology is sometimes over kid's head and teachers as well.
Sometimes more background info is needed.
However, next year will be easier.
2nd grade a "bugger" due to Horticulture and Crops
More supplemental material needed in Library. Good bibliography in most cases, but the teachers did not have reference.

C1: What have been the positive and negative impacts upon learners due to the Food and Fiber Systems project.

More teachers are going to the computer and using it.
Kids are teaching their parents, parents getting involved
Students bring F&F related items to class—Wool and Cotton plant
There is a transfer of knowledge to the community
Confidence of teachers has increased.
New teachers have been overwhelmed.

D1: How will the Food and Fiber Systems project impact you teaching in coming years?

Continue to use it as an enrichment course
Is getting easier to tie it into lesson plans
Crosses many different curriculums, helps tie them together

D2: What specific components of the Food and Fiber Systems Literacy would you be most likely to use in coming years?

Save our soil, sea to shining sea, trader's game (good teamwork lesson)
Cattle drive (team oriented), timeline of the land (4th grade)
Next year's seeds

E1: How has the Food and Fiber Systems Literacy effort impacted your local curriculum goals?

Coordinate efforts, to make the program flow from one grade to another
Purchase of books so that students can read more about F&F

F1: What reasons would you give your neighboring school system for adopting or not adopting the Food and Fiber Systems Literacy framework?

There is no certain order, system is flexible
Easy integration, good organization of the lessons
Students will see the benefits of this program
Hands on learning experience, easy to relate to

F2: What reasons would you give your state legislator or state superintendent of instruction for adopting or not adopting the Food and Fiber Systems Literacy framework as a statewide initiative?

Hopefully, increase in achievement test scores
Invite them to school, to see the program in action
Low cost

WOODLAND TEACHER INTERVIEWS

1/26/98

A1: Since your school was selected as a Food and Fiber Systems Literacy site, how has the community reacted to the project? What are some specific examples?

The community has NOT been involved
Some tours have been conducted
Career days

A2: What are the major benefits of the project from your perception? What are the major shortcomings (areas of improvement)?

Major benefits
Lessons relate to agricultural world
History repeats itself
Students are more aware of F&F system (some teachers did not think of it (weeds))
Natural for ancient studies

Shortcomings
More lessons need to be culturally related
Teachers are going 24 hours a day (conducting follow up is hard to accomplish at times)
Errors in technology on computers
Initial lesson binder short on middle school science lessons
Concerned if kids are making connections to agriculture
Interested in growth of project over a two to three years span-too short a time period for adequate reflection

A3: Have any groups emerged within your school or community to assist in any way with various aspects of the project?

None to this point
Slow process (school based garden)
Some parents are trying to get involved
Forge relationship at Sacramento State (using them along with F&F material)

B1: Why did you and/or your school site become involved in the Food and Fiber Systems project?

Nature of community
Jim Leising and committee recommended the school to take it
Staff meetings
B2: To this point, what results have you seen because of the F&F systems project?

Ag department has been an asset
Students understand the origin of products
Good for the Ag program (ties the entire curriculum together)
Presentations in class are better

B3: Give specific examples of ways that you have made connections between the Food and Fiber Systems framework and day-to-day instruction?

Graphing the rate of growth
Diversity of living things (students realize after the fact)
Culturally-related material (different countries)
Students looked at how other countries survive.

B4: How would you rate the quality of the Food and Fiber Systems instructional materials you have seen?

Very usable
Organized and easy to relate to
Need to pull other things into lesson plans (need more background information)
Connect to things in the classroom
Teachers need more background
The project made teachers go find other things for classroom instruction
Need more background activities
Had to visit extension service for background (could be seen as community involvement)

C1: What have been the positive and negative impacts upon learners due to the Food and Fiber Systems project?

Lots of time and energy needed-some teachers don't have but students do!!!!
Motivated to get other things done
Bring parents into project
Students are more involved due to F&F project
Discussion of meals (nutrition)
Students involved with processing (grinding up of nuts, wheat)
Where things come from
Students did not know the difference between seeds (don't see whole picture)
Peanut butter exercise is good

D1: How will the Food and Fiber Systems project impact you teaching in coming years?

Curriculum cycles (change in some way to fit same students)
Coordinate between grade levels
Help kids get some more experience in agriculture even though have Ag background

D2: What specific components of the Food and Fiber Systems Literacy would you be most likely to use in coming years?

Heightened awareness of agriculture (incredible dependence on agriculture)
Students want to keep doing projects

E1: How has the Food and Fiber Systems Literacy effort impacted your local curriculum goals?

Connection to science (silt, sand, and pebbles)
Inter-discipline of different curriculums

F1: What reasons would you give your neighboring school system for adopting or not adopting the Food and Fiber Systems Literacy framework?

Helps make real world connections
Good introduction to Ag world
Live in area to make good connections
Resource for hands on activities (concrete and interesting to students)
Dependent on agriculture (production)
Focus kids academically
Difference between rural and urban areas

F2: What reasons would you give your state legislator or state superintendent of instruction for adopting or not adopting the Food and Fiber Systems Literacy framework as a statewide initiative?

Concern with decreasing amount of food
Sell importance of educated workforce
Agriculture has an importance to world
Curriculum is integrated (agriculture ties it all together)
Literacy is critical (reading and writing skills are involved with this project)
Motivation of students
END OF YEAR INTERVIEWS

YALE
QUESTIONS ON ENGAGEMENT AND ACHIEVEMENT

1. Did you work with any other groups not mentioned in the last interview?

   Extension, planting pots of flowers and strawberries
   OSU (?) winter fair, brought information back.
   Stream erosion trailer from the Forestry Dept. at OSU (learn about clearing land)
   Extension guides (booklets)
   Langston was not cooperative all of the time. Some got to go, others were turned down
   Got pet turtle and crawfish

2. How do you think this project has impacted your schools?

   Found new resources and people
   Used internet, technology
   Now are connected to internet

3. Has the F&F project impacted your teaching?

   Discuss more things with kids
   Social studies and science book used to relate F&F (tie in more interrelationships)

4. Has the F&F project impacted student learning?

   Realize more that food doesn’t just appear (1st grade).
   Students see more connections in real life
   Learned, but uncomfortable with the idea of a predator, especially when it is happening in their classroom aquarium, still made them realize how nature works
   Learned about where things go (decomposition)
   Learned differences between plastic and leather
   Learned more practical applications
   Children can learn how dependent we are on this earth

LEADERSHIP

5. How have you, as a teacher challenged students differently this year compared to last year?

   Lots of new questions about where things came from
   How diet affects performance