1-1-1997

Perceptions regarding integration of agricultural awareness activities by elementary teachers in east central Iowa

Neil Armstrong Knobloch
Iowa State University

Perceptions regarding integration of agricultural awareness activities by elementary teachers in east central Iowa

by

Neil Armstrong Knobloch

A thesis submitted to the graduate faculty

in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Major: Agricultural Education

Major Professor: Robert A. Martin

Iowa State University

Ames, Iowa

1997

Graduate College
Iowa State University

This is to certify that the Master's thesis of

Neil Armstrong Knobloch

has met the thesis requirements of Iowa State University

Signatures have been redacted for privacy

DEDICATION

We are here but once. We pass through this life but once. The one who has a dream and pursues a dream will mark this life as one who has made a difference. The vision that agriculture would be taught in every classroom in Iowa has motivated the researcher to invest the resources of time, money, and energy for this study.

What will life be like in the year 2020? What will agriculture be like in the year 2020? What will agricultural education be like in the year 2020? The researcher envisioned the future of agricultural education and conducted this study to pass on a legacy of studying and experiencing agriculture from kindergarten through adult.

Therefore, this study is dedicated to my future children and grandchildren that they may learn and experience the agricultural industry which is the foundation of our economies and communities as well as our daily survival.

TABLE OF CONTENTS

LIST OF FIGURES vi

LIST OF TABLES vii

ABSTRACT ix

CHAPTER I. GENERAL INTRODUCTION

Introduction 1
Statement of the Problem 6
Purpose and Objectives of the Study 9
Need for the Study 9
Implications and Educational Significance 11
Operational Definitions 11

CHAPTER II. LITERATURE REVIEW
Introduction 14
Background 14
Rationale for the Study 20
History 25
Recent Efforts of Agricultural Awareness 29
Perceptions of Agriculture 43
Related Information 47
Research Questions 50
Summary 50

CHAPTER III. METHODS AND PROCEDURES
Introduction 52
Purpose 52
Design of the Study 53
Population and Sampling Procedure 54
Methods of Data Collection 55
Analysis of Data 57
Limitations of the Study 58
Assumptions 59

CHAPTER IV. REPORT OF THE FINDINGS OF THE STUDY
Rate of Response 60
Demographic Information of Elementary Teachers and Schools 61
Additional Demographic Information 64
School Information 65
Views on Integrating Agriculture into Elementary Classes 68

Agricultural Activities in the Classroom 72
Correlations of Selected Demographic Data 78
Comments Made By Elementary Teachers Regarding Teaching Agriculture 83

CHAPTER V. DISCUSSION
Perceptions of Agriculture 87
Basic Knowledge of Agriculture 88
Integration of Agriculture in the Elementary Curriculum 88
The Key Component of Successful Implementation 89
Agriculture Taught in Other Subjects 90
Agriculture Includes Other Career Areas 91
Activities Conducted in Urban Communities 91
The Role of School Administrators 92
Agricultural Resources and In-service Programs 92
The Impact of Agricultural Education Professionals 94
Agricultural Classes and Experiences 94
Guest Speakers and Field Trips 96
A New Paradigm for Agricultural Awareness 96

CHAPTER VI. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS
Summary 100
Conclusions 102
Recommendations 105
Recommendations for Further Research 109
Implications and Significance to Education 111

APPENDIX A. HUMAN SUBJECT REVIEW COMMITTEE APPROVAL FORM 112

APPENDIX B. SURVEY COVER LETTER AND INSTRUMENT 114

APPENDIX C. FOLLOW-UP POSTCARD 122

APPENDIX D. SCHOOLS IN THE GRANT WOOD AEA 10, 1995-96 124

APPENDIX E. OTHER COMMENTS REGARDING TEACHERS THOUGHTS ON TEACHING AGRICULTURE 129

REFERENCES 148

ACKNOWLEDGEMENTS 154

VITA 156

LIST OF FIGURES

Figure 1. The wheel of agriculture: a spin wheel model for integrating agricultural awareness activities 98

LIST OF TABLES

Table 1.	Response rate of survey participants	62
Table 2.	Grade levels taught by elementary teachers	63
Table 3.	Subjects taught by elementary teachers	63
Table 4.	Years of teaching experience by elementary teachers	63
Table 5.	Education level of elementary teachers	64
Table 6.	Gender of elementary teachers	64
Table 7.	Types of communities elementary teachers believed that they teach in	64
Table 8.	Other classes taught	65
Table 9.	Agricultural classes, workshops, or in-services taken	66
Table 10.	Summary of agricultural experience	67
Table 11.	Number and percentage of elementary teachers according to size of school (n = 281)	68
Table 12.	Frequency of responses regarding views of teachers on integrating agriculture into elementary classes (n = 281)	69
Table 13.	Means and standard deviations of views of teachers on integrating agriculture into the curriculum (n = 281)	71
Table 14.	Frequency of responses regarding agricultural activities used in the classroom by Grant Wood AEA elementary teachers (n = 281)	73
Table 15.	Means and standard deviations of agricultural activities used in the classroom by Grant Wood AEA elementary teachers (n = 281)	75
Table 16.	Summary of comments relating to support and/or concern of integration (n = 179)	84

Table 17. Summary of comments relating to areas of interests (n = 179) 84

Table 18. Public school districts in the Grant Wood AEA 10 for 1995-96 125

Table 19. Non-public schools in the Grant Wood AEA 10 for 1995-96 127

ABSTRACT

The purpose of this study was to analyze the status of agricultural awareness efforts in elementary grades in a selected area of Iowa and create a model of agricultural awareness for the community education system. The primary objectives of this study were: (1) identify elementary school teachers' perceptions on agricultural related issues; (2) identify the extent of current agricultural awareness activities; (3) compare selected demographic data with perceptions and activities of elementary school teachers in east central Iowa; and (4) develop a model for delivery of agricultural awareness programming.

This study was conducted using a survey instrument that was distributed to approximately one-third (n = 689) of the 2000 teachers in the Grant Wood Area Education Agency (A.E.A) which served as the sample population. The survey instrument consisted of four parts: {A} 31 statements with a 5 point Likert-type scale relating to knowledge and perception of agriculture and agricultural awareness; {B} 48 agricultural related activities that indicated the extent to which agricultural activities were conducted elementary classrooms; {C} an open-ended section for comments on integrating agriculture into the elementary curriculum; and {D} demographic information. A total of 281 usable returns were received for a 41% response rate. Descriptive and inferential statistic procedures were used to analyze the data.

The findings indicate that elementary teachers believe agriculture would enhance the elementary curriculum. There was strong indication that agriculture needed to be integrated within all instructional areas. Fifty-two percent of the teachers conducted at least half of the thirty-eight activities listed in the survey instrument. The respondents in

this study had positive views about agriculture as a highly technological, science-based, environmentally conscious, competitive industry with a wide variety of skilled and educated employees.

A spin wheel model was designed based on the findings of the study. The model, "The Wheel of Agriculture," was designed to help elementary teachers generate ideas, plan activities, and organize their classes to relate their subjects to the seven career areas of agriculture. The model was designed with considerable flexibility for all grade levels, subject areas, and teaching styles. The model helps teachers consider the agricultural careers and resources needed to conduct the agricultural awareness activities.

CHAPTER I. GENERAL INTRODUCTION

Introduction

It was common in the beginning of our country that most families lived off the land and the parents would raise their own food to feed their children. Agriculture was localized and people used indigenous knowledge to raise enough food to survive. A lot of labor went into producing the crops and caring for the livestock. Productivity and efficiency were limited and the supply of food was also limited because there was not a developed distribution system or means to store food long-term. Lasley stated that about a third of Iowa's population in the 1930s and 40s lived on farms compared with about ten percent today (De Christopher, 1993). More people were farmers and a lot of people were also involved in food processing and preservation. People spent a great amount of time doing tasks such as gardening, canning, and curing and smoking meat (De Christopher, 1993).

The industrialization of America with the use of machinery and technology, the advent of using fertilizers and pesticides, and the development of hybridized plant varieties dramatically changed the food and fiber system from the farm to the table. The Secretary of Agriculture noted that the steady decline in the number of farms and the increase in acreage means agriculture is becoming more efficient and competitive in the global market place ("USDA," 1997). Today, the transformation of a highly technological, information media-based America with the use of satellite imagery technology, biotechnology, and computerized technology has changed the social, economic, and political structure of America and agriculture.

The demographics of our nation are changing and these changes have affected agriculture. Seventy-five percent of the people live around population centers (De Christopher, 1993). Grocery stores have large quantities and selections of food. Fewer citizens in our country are involved in producing food; less than two percent of the working population is involved in food production (De Christopher, 1993). According to the 1992 Census of Agriculture, there are 1,925,300 farms in the United States. This is the lowest number of farms since before the Civil War. In 1935, the census counted the highest number of farms, 6.8 million (American Farm Bureau Federation, 1995). The farm crisis in the 1980s put an economic squeeze on financially struggling farms and the small population of farmers continued to dwindle. The farming population is getting older, too. According to Secretary of Agriculture Glickman ("USDA," 1997), the average age of the American farmer is now 58 years. Bohr (1996) predicts that at least half of the farming population will retire within the next ten years. The capital investment of an independent farmer has made it difficult for young people to start farming. Thus, there are fewer children and students directly involved in farming as the farming population continues to get older, and there are fewer and smaller families of younger couples investing in farming. According to Johnson (1997), farm families are having fewer children than their urban counterparts.

The demographics of America are shifting since 75 percent of the population is urban and now the urban population is spreading out of the cities (De Christopher, 1993). Ninety percent of America's population has been off the farm for more than 30 years (Douglas, 1984). Moreover, the rural population is changing as people from the cities

move out into the country. Lucht (1994) referred to the urban population movement into rural areas as the "urban sprawl"; he noted that 56 percent of the total market value of agricultural products sold in the nation is produced in counties on the edge of expanding cities. There is concern that urban and housing developments are taking farm land out of production so that there will be fewer acres of land to produce food for a growing world population. Further, Lucht (1994, p. 19) cites that "there is an attitude that building houses is a better use of the land than farming; there is also a lot of ignorance about farming by a lot of these people who are moving in." Johnson (1997) reported that there are more non-farmers living in rural areas than there are farmers in Iowa.

The agriculture industry is one of the largest industries in America and more people work in agriculture than any other industry in our nation (Iowa Farm Bureau Federation, 1997). The demand for people to work in agricultural careers continues to grow and there are not enough qualified people to fill the jobs (Goecker, Coulter, and Stanton, 1995). Fewer students are learning and experiencing agriculture in contextual settings of growing up on farms, working for agricultural businesses, or raising livestock. Nearly everyone makes decisions related to agricultural concepts and knowledge, yet there are large percentages of students who do not know or understand agricultural concepts. Very few people understand the connection between farming as part of the food system (De Christopher, 1993). Most people do not understand America's food system or its impact on society and the world (Frick, Kahler, & Miller, 1991). Researchers who have studied this phenomenon define it as agricultural illiteracy. De Christopher (1993, p. 15) reported that Lasley, the sociologist who conducts Iowa State University's annual Iowa

Farm and Rural Life Poll, quoted "If you look at those who are two or three generations removed from the farm, you find that their understanding of agriculture is very sketchy." In addition, Kristen Allen, a research fellow in St. Paul with Minnesota's Department of Agricultural and Applied Economics, says that people's lack of agricultural literacy stems largely from "simple demographics. People simply have not been exposed to food production and food production technology" (De Christopher, 1993, p. 15). Lasley and Allen stress the importance of better communications between farmers and non-farmers because they are distancing from farm life and the increasingly urban public's clamor for safe food and clean environment (De Christopher, 1993). De Christopher (1993) reported that it may take years of proactive education about agriculture rather than reacting to negative incidents. The agriculture sector has taken a very defensive stance in a lot of cases and this makes people very skeptical. More needs to be done in advance with the non-farm sector in educating them about agriculture (De Christopher, 1993).

This distancing from agriculture among the non-farm sector is referred to as the generation gap of agricultural literacy. According to the Environmental Education Committee of the Johnson County Soil and Water Conservation District (1993, p. 3),

> The American society has, to a large extent, become alienated from the land and from agriculture. There is a growing schism between rural and urban populations as contact between the two steadily declines and the knowledge of agriculture wanes among the vast majority of our populace. Any environmental education program in Iowa that does not teach agriculturally related environmental issues has a major gap. An understanding of agriculture will significantly improve people's environmental awareness level and close the gap of agricultural illiteracy.

A person becomes literate when they learn the common language. Communication and language in children develops at very young ages. Psychologists have learned that

personalities and understandings are formed at an early age. According to Berk (1989, p. 429), "By age five, they use many emotional words that are adult-like and toward the end of elementary school, they take multiple sources of information into account in discerning the feelings of others." Thus, elementary students are taught how to read, write, and learn important concepts that an educated citizen will need to know to function in society. Since agriculture is an important function of our society, economy, and means for survival, students should be taught agricultural knowledge and concepts to make better decisions and function more effectively in society. Students should be taught agriculture as a part of their schooling in the elementary years. Thus, the researcher surveyed elementary teachers about what they think about agriculture and what they do in their classrooms regarding agricultural related activities.

The experiences of living on a farm can be very educational and teach values such as responsibility. Recognizing that fewer children have the experience of growing up on a farm, the following anecdote illustrates the thoughts of a child who experienced production agriculture while attending a rural school in an agricultural community.

> A man in his twenties reflected on his memories of growing up in a small, rural community in Iowa in the 1980s. The community was located in northwest Iowa where agriculture was dominant and businesses were very dependent upon the agricultural economic activity. This young boy learned and loved the farm life at a very young age of watching his dad through the living room window and then simulating his daily chores by farming on the carpet with his 1/16th scale model tractors. The boy's love for the farm continued to grow and he moved his "farm" outside underneath the corn crib. He could now farm in the dirt, get dirty, and watch his dad drive up the driveway with the tractor and wagon. As the boy grew older, he could sense a greater need to be closer to the farm and the land and he convinced his dad to let him drive the tractor for the first time when he was 10 years old. The farm boy experienced something that very few kids would ever experience--farming the land. He became very involved in the daily operations of

his parent's farm and he developed a great love and appreciation for the land, hard work, way-of-life, agricultural commodities, and agricultural business.

The young man recalled another childhood experience of when he was in kindergarten. He remembered going to school and feeling bored and uninterested because the subjects that he was learning did not seem relevant to his life. He learned to like school because he knew it would be good for him. However, he recalled one day in kindergarten when the class did a worksheet of associations that had agricultural examples. He was motivated. He was excited and learning was fun. He remembered thinking the question, "Why don't they teach us about agriculture?" The school years went on and the young man does not remember getting motivated to learn like he did that day in kindergarten until he was enrolled in a high school agriculture class. What was lacking in his education? Why was there so little taught about agriculture in such a active, agricultural community?

The anecdote highlights an experience that even fewer children will experience as the farm population continues to decline. The farmers are aging, thus, fewer farmers are raising children on farms (American Farm Bureau Federation, 1995). The generation gap in agriculture is widening and many children in today's schools are two to three generations removed from the farm. Many children have no connection to people who farm the land. Some may ask, "Why should students in elementary grades be taught agriculture if they are not directly connected to agriculture?" Others believe that the food and fiber system should be taught to children, because it is part of many decisions that they will make personally and possibly in their lives and careers.

Statement of the Problem

It is common to get responses from children that they think their food comes from the grocery store and that brown cows produce chocolate milk. This is an example of the ignorance about agriculture. These children are ignorant, not necessarily by choice, but because they have not been taught or exposed to agricultural concepts. What price will our

society pay for agricultural illiteracy?

The concern of professionals in the agricultural industry and education fields is that if children are not accurately educated about agriculture, someday they will be in leadership positions and productive employees of our nation who will pass laws and govern our communities without a basic understanding of the largest industry in the United States. What effect will a prominent nation led and governed by agriculturally-illiterate leaders have on the global food supply?

Agriculture is America's largest business employing over twenty percent of the workforce (American Farm Bureau Federation, 1995). If one in five Americans will be working in the agricultural industry someday and they have no depth of understanding of agricultural concepts, principles, and situations, the cry of inadequate and unprepared employees entering the workplace will be commonly spoken by employers and personnel training professionals. If the agricultural industry employs the most people, why are many schools not teaching agriculture in the elementary and secondary levels?

Currently, businesses and industries are reporting to schools that they need graduates who are adequately prepared to work. Too often, businesses need to spend time teaching the basics that should have been learned and reinforced all the way through the secondary grade levels ("More Training Needed," 1996). If this is true for other businesses, then what will exist if agriculture is not being taught in all of our schools?

Mayer and Mayer (1974, p. 84) stated that "the failure of our secondary schools and liberal arts colleges to teach even rudimentary courses on agriculture mean that an enormous majority, even among well-educated Americans, are totally ignorant of an area

of knowledge basic to their daily style of life, to their family economics, and indeed to their survival." Further, Horn and Vining (1986) found that fewer than 30 percent of 2,000 Kansas students sampled could correctly answer basic agriculture questions. Lucht (1993) reported that a Coalition for Agricultural Image and Promotion (CAIP) study of agriculture's image among 11 to 14 year old students showed that many students still equated agriculture only with farming and thought that farmers were dirty, old men who chewed on straw and smelled like manure. Further, the study showed that knowledge about agriculture did not vary dramatically between rural and urban students, but their attitudes towards agriculture and agricultural careers did vary. In addition, some urban youth were not only ignorant about agriculture, but they were satisfied to remain that way (Lucht, 1993). According to Holz-Clause and Jost (1993), the 6th, 7th, and 8th graders in the focus study saw agriculture with a limited future and expressed traditional thoughts about agriculture.

With little research conducted in the realm of agricultural literacy, Frick, Kahler, and Miller (1991) refined a group definition of agricultural literacy, identified agricultural subject areas that fall within the framework of agricultural literacy, and identified those concepts about agriculture that every citizen should know. They documented several examples of simple agricultural principles that are needed by everyone to function as an informed consumer and citizen.

Cheek (1985) surveyed state occupational program directors and found that there were no states that had formalized, funded agricultural education programs at the elementary level (K-6). Further, four states indicated involvement of a range of

agricultural education in the elementary level and eleven states had formalized, funded, agricultural pre-vocational programs in grades 7 and 8 (Cheek, 1985). The Committee on Agricultural Education in Secondary Schools issued a huge challenge that agricultural literacy programs be implemented at all levels of education (National Research Council, 1988). Osborne (1993) expressed that the agricultural education profession has responded with very successful agricultural literacy initiatives in grades K - 6.

Purpose and Objectives of the Study

The purpose of this study was to analyze the status of agricultural awareness efforts in elementary (K through 6) grades in a selected area of Iowa and create a model of agricultural awareness for the community education system. There were four primary objectives of this study:

(1) Identify elementary school teachers' perceptions regarding issues related to agriculture.

(2) Identify the extent to which agricultural awareness activities are conducted in elementary school classrooms.

(3) Compare selected demographic data with perceptions and activities of elementary school teachers in east central Iowa.

(4) Develop a model for delivery of agricultural awareness programming.

Need for the Study

The discussion for the need of educating elementary students about agriculture dates back to the 1930s--a few years after the Smith-Hughes Act funded vocational agriculture programs in high schools (Fox, 1932). The discussion continued through the decades and it became more frequent in the early 1980s. The issue of agricultural

awareness among all citizens is important because everyone makes decisions regarding agricultural concepts in many areas of their lives. According to Lichte and Birkenholz (1993), agricultural literacy will help people in the general public make wise decisions. For example, every consumer is bombarded by many marketing claims and he/she stands in the aisle of the grocery store trying to sort out all the information to make a decision or decisions on what the family will eat that week.

Moreover, the need for literate citizens about agriculture will help this nation be prosperous and competitive in the global markets. In 1988, the National Research Council's Committee on Agricultural Education stated that "achieving the goal of agricultural literacy will produce informed citizens able to participate in the policies that will support a competitive agricultural industry in this country and abroad." This is a very important issue and since fewer people are connected with actual agricultural experiences, this study was conducted to collect information from elementary teachers to find out what they think, believe, and do about teaching agriculture in their classrooms. The need for this study was justifiably important because there was limited research data on agricultural awareness in the elementary grades. In visiting with professors in agricultural education and researching the literature, the researcher has not found a study that addressed the attitudes, knowledge, and activities of elementary teachers regarding agricultural awareness. This baseline study established the what, the why, and the why not that is being taught about agriculture in the elementary grades. This study could impact future programs and activities that may be implemented at the elementary and middle school/junior high levels. Also, secondary programming could be established upon the

agricultural awareness foundations. The university teacher education programs should use the information to develop teacher training seminars for elementary teachers. Future studies may be done to expand on the baseline objectives of this study.

Implications and Educational Significance

This study identified the perceptions and knowledge of elementary teachers about statements related to agriculture. The teachers also indicated the frequency of educational activities that were agriculturally related. The study could significantly assist the effort of agricultural education professionals on agricultural awareness by giving a research base on which to build educational programs and activities. The research tool could provide agricultural education professionals valuable information on educational activities currently used by elementary teachers to integrate agriculture into other disciplines. The study could also provide insight on what elementary teachers want and need to successfully integrate agriculture into their classrooms.

Operational Definitions

There are several terms that need to be defined to conduct this study. The terms agricultural literacy and agricultural awareness were used throughout the literature review almost interchangeably; however, the researcher defined the difference between the two terms. For this study, the terms will be defined as follows:

Agriculture - of or relating to the production, processing, and distribution of food and fiber; also, the ecological science and conservation of the natural resources and environment. The areas that are included in the study of agriculture in secondary education are Agricultural Production, Agricultural Mechanics, Agricultural Sales & Services,

Agricultural Processing, Horticulture, Natural Resources and Conservation, and Forestry.

Agricultural Activities - a specific, organized, and supervised action relating to agriculture; learning events.

Agricultural Awareness - experiencing or exploring agriculture as it relates to the subject matter being studied or context of life being lived; the ability to identify the connections of agriculture to areas of study or life.

Agricultural Concepts - a general idea or understanding of knowledge related to agriculture; knowledge-oriented ideas.

Agricultural Literacy - possessing the knowledge and understanding of our food and fiber system; the ability to synthesize, analyze, and communicate basic agricultural information (Frick, Kahler, and Miller, 1991).

Ag. In The Classroom - The USDA program started in 1981 that provided materials and resources to incorporate agriculture into elementary classes that was organized and delivered in each state.

C.A.I.P. - The Coalition for Agricultural Image and Promotion; a group of Iowa agricultural interest groups working together to assist elementary school teachers add agricultural perspectives to the curriculum.

Elementary - An educational level of students in grades kindergarten through 6th.

Elementary Course of Study - an area of instruction such as language arts, science, etc.

Elementary Curriculum - everything that happens in a school that instructs students which includes classes, guidelines, expectations, etc.

Grant Wood Area Education Agency - One of the educational service delivery agency for

schools which serves a seven county area in east central Iowa.

Integration - the blending of a topic or subject into the current subject or class taught; teaching a topic/subject within an existing subject.

CHAPTER II. LITERATURE REVIEW

Introduction

The purpose of this study was to analyze the status of agricultural awareness efforts in elementary (K through 6) grades in a selected area of Iowa and create a model of agricultural awareness for the community education system. There were four primary objectives of this study:

(1) Identify elementary school teachers' perceptions regarding issues related to agriculture.

(2) Identify the extent to which agricultural awareness activities are conducted in elementary school classrooms.

(3) Compare selected demographic data with perceptions and activities of elementary school teachers in east central Iowa.

(4) Develop a model for delivery of agricultural awareness programming.

Background

Children were taught agriculture in nearly every home in America in its early days. Seventy-five percent of the U.S. population lived in rural America and over 40% lived on farms a little over 100 years ago (American Farm Bureau Federation, 1995). It was common that families would raise much of their own food to feed the family. Children grew up working to raise the food that they would also eat as a meal. Educational psychologists have found that attitudes, values, and interests of children are formed at an early age as a part of the developmental process (Berk, 1989). This concept is important because many students came from agricultural backgrounds and thus developed interests and experiences in agriculture (Cheek, 1985). Further, according to Daggett (1995), our

society was based on agriculture around the turn of the century; it moved to an industrial system since the 1940s. Educators and legislators saw a need for agriculture in American schools and in 1917 the Smith-Hughes Act establish Vocational Agriculture courses to train boys how to farm. Although agricultural education was organized and implemented at the secondary education level, it was also being discussed that it should be taught in the elementary schools as well. Davenport (1914, p. 144) explained:

> Even though the ideal cannot be attained, an honest attempt is well worthwhile, and if the teachers can be induced to combine, along with observation and record, the elements of usefulness and the human relation, then it will be well worth all its costs to stimulate as much as possible the teaching of agriculture in the (elementary) grades of the public schools.

Thomas Jefferson believed that agriculture should be part of the general education system (Little, 1987). Fox (1932) and Shively (1936) wrote about teaching agriculture to elementary students. Further, Herr (1968) discussed an extensive program for elementary students in Pennsylvania, and Wolfson (1970) described a comprehensive program for elementary and junior high students in the Los Angeles public schools. Other authors have written about agriculture being taught in elementary schools in the 1970s are Peterson and Barduson (1973), Keenan (1970), Shepard (1970) and Swan and Donaldson (1970). Therefore, agriculture teachers have long believed that it is important to instill knowledge, attitudes, and skills about agriculture before students reach the high school level. Agriculture teachers have conducted agriculture programs in elementary grades for over 25 years in attempt to accomplish these objectives.

The industrial, mechanical, and chemical revolutions created more technologies and better products to make agricultural production more productive and efficient, the number

of farmers started to decline rapidly. According to Lichte and Birkenholz (1993), three percent of America's workforce produces twenty percent of the world's food supply. Coincidently, Frick (1988, p. 13) stated that "the rapid urbanization of the United States has meant that schools, in general, have fewer rural students." Students graduating from these schools will be our leaders of tomorrow and know far less about the significance of agriculture. Frick (1988) mentioned that agriculture is significant because it makes up a vital part of our world in which we live: the standard of living, the dimensions of world food needs, international trade, and employment opportunities.

Agriculture has changed dramatically in the past 100 years as has the need for changing agricultural education. According to Newcomb, McCracken, and Warmbrod (1986), vocational and technical education programs in agriculture have continually expanded to include specialized programs specifically oriented to farm and non-farm occupations requiring knowledge and skills in agricultural subjects. Although the Smith-Hughes Act was essential, the face of agriculture has changed significantly from advancements in society since 1917. Therefore, the Vocational Education Act of 1963 and the Vocational Education Amendments of 1968 expanded the definition and emphasis of agriculture from solely production agriculture to also include agricultural supplies and services, agricultural mechanics, agricultural products, processing and marketing, horticulture, agricultural resources, forestry and other agricultural areas (Newcomb, McCracken, and Warmbrod, 1986). However, our society still equates agriculture with farming (Everett, 1985). In spite of the broadened definition of agricultural education, the role of agricultural education was still teaching production agriculture until there was

concern about the future of farming in the midst of the farm crisis in the 1980s. Furthermore, some school districts and communities questioned the need for secondary agricultural education and reduced the funding or eliminated the program. Now, there is concern about agricultural education not being taught in the homes, elementary schools, and secondary schools. The trend that fewer people and children are directly involved in agriculture means less understanding and perceived need for agriculture. However, some are alarmed about this trend.

Why is there a concern about being literate about agriculture if less than three percent of the U.S. workforce is in production agriculture? According to Mawby (1984, p. 72), "many bad decisions affecting food production can be traced to a lack of understanding about agriculture on the part of the 97 percent of our people who don't live on farms." All citizens need to develop a minimum understanding about agriculture, food, and food production so that they can make logical decisions about policies and issues affecting agriculture (Russell, McCracken, and Miller, 1990). In addition, Mayer and Mayer (1974, p. 84), writing for the American Academy of Arts and Sciences, contended that "the failure of our secondary schools and liberal arts colleges to teach even rudimentary courses on agriculture means that an enormous majority, even among the well educated Americans, are totally ignorant of an area of knowledge basic to their daily style of life, to their family economics, and indeed to their survival." Thompson (1986) stated that if well informed citizens remain ignorant of basic facts about food, agriculture, and natural resources, the activities of agricultural colleges will be perceived as serving only the interests of a narrow constituency.

Consequently, since the Smith-Hughes Act in 1917 that started vocational training of boys to become farmers, agricultural educators have been discussing the need to start teaching agricultural concepts at the elementary grade levels. Vocational agriculture has been very successful at the secondary level; a study of vocational agriculture graduates revealed that 92 percent rated the program high even though 47 percent were not employed in agricultural occupations (Iverson, 1980). Further, the Committee on Agricultural Education in Secondary Schools (National Research Council, 1988) found that vocational agriculture programs have had a positive effect on thousands of people including students, their families, and local communities. However, there has been some discussion about the segmented, partially organized implementation of elementary agricultural education programs throughout the decades (Doerfert, 1995).

During the 1970s, there was more emphasis on career awareness, orientation, and exploratory programs mainly because of the career education movement initiated by Maryland (Cheek, 1985). Over 25 years ago, Swan and Donaldson (1970, p. 282) expressed concerns about the apathy Americans have about agriculture:

> The blunt truth is that Americans take bountiful harvests for granted and demonstrate unconcern and indifference toward their food supplies. Contrast this affluence with the threat of famine, the short harvests, and the severe food crises perennially threatening families in South America, India, and most other Asian countries.

Swan and Donaldson (1970, p. 282) continued to express their concerns about this attitude and the need for elementary students to learn and experience agriculture:

> Why this indifference, this lack of concern for the nation's food and fiber? By and large, teachers and the public schools have ignored agriculture. They have failed to orient the growing population to the need, contributions, and limitations of America's agriculture. This situation will not improve as the percentage of the

> population living on only one percent of the land increases from the present 75 percent to 90 percent by the year 2000 and as fewer and fewer teachers bring rural backgrounds to the schools. America has a new minority problem. The fact is that most Americans do not understand their land or the people producing their food and fiber. Furthermore, too many people do not care.

Swan and Donaldson (1970) were adamant about agriculture being taught to elementary students and said that "it is about time that agricultural educators did something about this." They suggested that children be provided experiences to visit farms that will help them develop some real understanding and appreciation for agriculture and farmers.

Coincidently, about the same time when the farm crisis shook the economic and social fabric of the farming community and agricultural industry, there was a renewed interest in educating elementary students about agriculture. Farm organizations and agricultural businesses renewed their discussions about what they could do to help get agriculture into the minds of children since everyone comes in contact with it when they eat and clothe themselves. It has been mentioned by several spokespersons in agriculture that farmers and commodity groups need to help educate children about agriculture (Lucht, 1993; De Christopher, 1993).

Further, agricultural education departments at land grant universities teamed up with the agricultural industries and commodity groups to teach elementary teachers about agriculture. Once the teachers were trained and educated about agriculture, there was a greater chance that elementary students would be taught about the largest industry. What effect did the farm crisis and the National Research Council's Study on Agricultural Education have on renewing the interest in agricultural awareness and literacy at the elementary grade levels?

Rationale for the Study

The basis of learning begins at a very young age (Glover & Bruning, 1990). Berk (1989) suggests that a child's personality is formed by the age of five. According to Cheek (1985, p. 4), "educational psychologists tell us that attitudes, values, and interests of children are formed at an early age, and that while this is the developmental process, much of it is completed by the end of middle school."

According to Coon and Cantrell (1985), they mentioned that children's attitudes and career objectives are often formed at a very young age. Thus, exposure to agriculture in elementary and secondary schools will make students better consumers of agricultural products and more supportive of the agricultural industry. According to Lykens (1994), "Perceptions of agriculture are formed at an early age of preschool." Furthermore, Glover and Bruning (1990, p. 31) stated, "Prior knowledge about a topic is directly related to the amount of new information students are able to remember about that topic. Knowledge influences their ability to think, to solve problems, to explain--all of their cognitive processes." Thus, knowledge about agriculture plays a major role in thinking and decision-making regarding situations that are agriculturally related.

Cheek (1985, p. 4) emphasized the importance of elementary and pre-vocational programs because "they help students explore their abilities, interests, and aptitudes; become aware of careers; investigate career opportunities; develop their interests; learn how to work with others; and develop career decision-making skills." Students also experience agriculture with "hands-on," applied activities that are motivating to the learner.

Since there are fewer farmers and farm families, it is important to stimulate younger

students' interest in agriculture because fewer students are growing up on diversified agricultural operations (Dubes, 1985). Further, the study on agricultural education by the National Research Council (1988) found that systematic instruction about agriculture should be taught from kindergarten to twelfth grade.

Further, people retain the information they are taught if they are actively engaged in applying the concept, seeing the knowledge used in context, or understanding the relevance of the topic being learned. Dewey's research found that experiential learning gets the learner more involved and enthused about the subject matter. "There is an intimate and necessary relation between the processes of actual experience and education" (Dewey, 1938, p. 20). Since everyone is connected to agriculture by the food they eat, the clothes they wear, the plants they grow, the environment they live in, and perhaps the career that they actively pursue, agriculture is a subject that cannot be overlooked by teachers and adults in our society. Agriculture is our nation's largest industry and employer. Agriculture is a relevant and practical science that can be integrated into nearly every subject that is taught in our schools. Dewey (1938, pp. 47-48) wished that experiential learning could be obtained through the agricultural education program, he explained that:

> Almost everyone has had occasion to look back upon his school days and wonder what has become of the knowledge he was supposed to have amassed during his years of schooling, and why it is that the technical skills he acquired have to be learned over again in changed form in order to stand him in good stead. These questions cannot be disposed of by saying that the subjects were not actually learned, for they were learned at least sufficiently to enable the pupil to pass examinations in them. One trouble is that the subject-matter in question was learned in isolation;...it was segregated when it was acquired and hence is so disconnected from the rest of experience that is not available under the actual conditions in life. It is contrary to the laws of experience that learning of this kind, no matter how thoroughly ingrained at the time, should give genuine preparation.

Agricultural awareness activities as defined as learning opportunities that actively engage the learner about a concept that relates to agriculture has an essential place in the classrooms and curricula of our schools, especially the elementary classes. Dewey's theory on experiential learning simply stated that people will learn more when they experience agriculture in their instruction and lives.

Further, entrepreneurs and employers are looking for educated, hardworking employees who have the ability to solve problems and improve the efficiency of the business operations; thus, providing more productivity and profits for the businesses. Agricultural education at the secondary level has based its instruction on problem-solving teaching methods since the early 1900s. Agricultural awareness education can be integrated into elementary classes to help students learn and retain more knowledge and understanding of concepts. The problem-solving theory has an essential role in the classrooms across our nation. In essence, students learn more when they can solve relevant, practical problems; thus, students will learn how to solve problems more effectively using agricultural examples because agriculture is so prevalent in society today. Agriculture exists in our society in many ways as illustrated by the seven occupational areas in agricultural education: Agricultural Production, Agricultural Sales and Services, Agricultural Mechanics, Agricultural Processing, Horticulture, Forestry, and Natural Resources and Conservation. Many times all or nearly all seven areas of agriculture can be found in the communities of our schools.

Moreover, agricultural awareness activities will enhance the learning process in schools because they facilitate practical, applied learning methods in agricultural related

contexts. According to Moore (1993, p. 23):

> Educational researchers and educators have proven over and over again that students are more interested in learning, if given the opportunity to use their hands in the learning process. This finding has also been most prevalent in classrooms whereby teachers have used agricultural and natural resource materials to teach basic academic subjects.

The Iowa Beef Industry Council has found that elementary teachers have responded very positively to the agricultural awareness materials that they have developed ("Educators Find," 1997).

According to Bloom, et al. (1956), there is a taxonomy of learning. People learn more when they engage more senses in the learning process; thus, students learn more when agricultural examples are used to stimulate the senses of sight, sound, touch, smell, and taste.

Further, Parsons (1909) mentioned that three processes are necessary when a person selects a career: (1) students must have self-understanding; they must understand and realistically appraise their abilities, interests, and aptitudes; (2) they must have knowledge and understanding of occupations and of occupational opportunities; and (3) they must reason concerning the relationships between these two sets of information. Many things have changed in society and the workplace since Parsons perceived the career decision-making process; it is more complex and fast-paced with more career opportunities. Thus, creating more need for self-understanding, occupational knowledge, and decision-making for students today (Cheek, 1985).

There is a great need for teaching elementary students about careers. According to Skolnik (1995, p. 36):

> In a recent national survey conducted by the Foundation for Advancements in Science and Education (FASE), children in third through sixth grades were asked to name five jobs. Only a small percentage were able to think of anything other than a doctor, teacher, fireman, or lawyer... but, none seemed to be aware of technically-oriented jobs such as a "computer programmer" or "video technician". Only 158 out of almost 1000 could name jobs held by members of their families.

According to Skolnik (1995, p. 37), Kay Toliver, a Presidential Award winner who has taught math at elementary and middle school levels for 28 years in New York City, stated:

> It needs to be started early, before the child turns off the job world. It should be started as soon as the child knows that a job is what adults do every day. My kids have dreams, but unless they know what the real world of jobs is like, they don't have any way to put a foundation under those dreams. How can a child have a dream if he has no information?

Differences can be made in directing elementary students to start thinking about their future careers. When over 700 elementary students were shown a five-minute preview of *The Eddie Files* featuring on-the-job interviews with professionals, 95 percent of the students said the video made them more interested in finding out how math is used in the real world, and 67 percent said that they were curious about jobs portrayed in the clip--architect, television director, and veterinarian--and that they might like to do those jobs (Skolnik, 1995).

Because there is little vocational education in elementary schools, Toliver encouraged counselors and teachers to do their part to help kids view jobs as opportunities. When she's not teaching she travels widely, lecturing and conducting workshops for teachers and teacher trainers. Teaching is helping students build a bridge to the world outside the classroom. (Skolnik, 1995).

Further, other professionals feel that there are plenty of activities that elementary

teachers can do to enhance the education about food, nutrition, and agriculture ("Educators Find," 1997).

History

The need for agriculture in the elementary grades dates back to 1932 (Fox, 1932). Swan and Donaldson (1970, p. 282) stated that "children should be provided experiences that enable them to develop some real understanding and appreciation of agriculture and farm people." In the early 1970s, an attempt was made at the national level to integrate more information about American industries, including the agricultural, natural resources, and food enterprises. This was related to the popular term--career education. Although this movement was successful in some school districts; overall, it fell short of achieving its goals. According to Moore (1993, p. 10):

> The lack of knowledge regarding the U.S. food system concerned former Secretary of Agriculture John Block and former Secretary of Education Terrel H. Bell in the early 1980s. In 1983, these two cabinet officials asked state governors to add their signatures to those of all living Secretaries of Agriculture, endorsing the Agriculture in the Classroom Declaration of Principle. Thirty governors signed the Declaration of Principle. The purpose of the Declaration of Principle was to provide state action groups with a tool they could use to call school officials' attention to the significance of the Agriculture in the Classroom effort. The Declaration of Principle stated, 'Agriculture is the foundation of human life. The production and distribution of food and fiber have shaped the development of mankind since the beginning of time'. American agriculture affects all of us as consumers, workers, and citizens.

Today, Agriculture in the Classroom is present in 50 states, as well as Micronesia, Guam, the Virgin Islands, and Puerto Rico. The National Research Council (1988) established the Committee on Agricultural Education in Secondary Schools, and this committee reported that Agriculture in the Classroom is a model program which could be used to improve education about contemporary agriculture. The United States Department

of Agriculture started a new program in 1981 called "Agriculture In the Classroom" through state departments of agriculture or state Farm Bureau organizations. This program was implemented to accomplish exactly what its title depicts. According to NRC (1988, p. 18), "It works by incorporating agricultural instructional material and subject matter into classroom activities. It is the most extensive effort under way to make elementary school students more knowledgeable about the food and fiber system."

The program was successful in getting agriculture into elementary classrooms, however it did have a weakness. According to Martin (1995), "The Ag. in the Classroom program was heavily centered around production agriculture. Even though this is very important, it is not a true picture of agriculture and the materials should also include more on agribusiness, international agriculture, and natural resources."

Coincidently, in the early 1980s when the farm crisis hit, another problem that was developing over time was finally identified as a crisis and taken seriously as well--agricultural illiteracy. In 1985, the National Research Council established the Committee on Agricultural Education in Secondary Schools at the request of the U.S. Secretaries of Agriculture and Education. This study was started because of lack of profitability in agricultural production; less international competitiveness in the agricultural marketplace; and concern about the content, declining enrollment, and quality of agricultural education programs (NRC, 1988). The Committee's Report, "Understanding Agriculture: New Directions for Education," (1988, p. v) reported:

> In the 1980s, many forces have challenged American agriculture and education. These forces include demographics; urbanization; rapid gains in worldwide agricultural production capacity; domestic farm and trade policies; lifestyle changes; global competition in basic and high-technology industries; the explosion

> in knowledge caused by increasingly sophisticated computers, digital equipment, and biotechnological techniques; specialization within the professions; and public expectations about the role of schools, the food supply, and public institutions.

These forces created concerns that initiated a study on agricultural education in 1985. Furthermore, the National Research Council (1988) Committee envisioned that every American citizen should have the basic knowledge to understand the food and fiber system including its history, current economic, social, and environmental significance to all Americans.

In Michigan, key education and agricultural leaders identified the need for a statewide plan to restore vitality to agricultural education at all levels at the 1985 Governor's Conference on the Future of Michigan Agriculture. The governor responded to this recommendation by establishing the Task Force on the Revitalization of Agriculture Through Research and Education. The Task Force analyzed agricultural education by saying that "dynamic, futuristic agricultural education and research programs must be offered to give K-12 and college students the knowledge and career awareness necessary to keep pace with the demand for well-qualified professionals" (Moore, 1993, p. 11). According to Moore (1993, p. 11), the Task Force focused on what they thought was needed in the future:

> Michigan needs a broad, innovative agricultural education program that can be incorporated into the K-12 curricula in school systems throughout the state. Such a program would not only help funnel young people into agricultural careers and expand the state's economy, but also would create more informed consumers and responsible citizens. Education about the food and agriculture system can incorporate important wellness, environmental quality, international trade, and foreign cultures.
>
> The demographics of our nation are changing from rural to urban, farm to non-

farm, and kitchen prepared meals to convenience foods (Johnson, 1994). The danger to food production is a perception by non-farmers that farmers are wrecking the environment. In addition, non-farmers do not understand animal husbandry and it creates what Amy Barr, director of the Good Housekeeping Institute, calls "a smart-dumb paradox." Consumers know more about food, but frequently without fact (Johnson, 1994). Food safety is the issue of the decade. We have the safest food supply (in the world), but there is room for improvement. Barr urged farmers, who have a high degree of credibility among consumers, to talk more with consumers to explain farming and the benefits of farming practices, such as using technology. Johnson (1994) reported, "Acknowledge that there are problems, but that agriculture is working on them." The danger to the U.S.'s bountiful food production system is that too many Americans no longer relate food with farmers because too much food comes already prepared.

In Iowa, CAIP conducted a study that found some alarming results on agricultural illiteracy. A focus group study conducted by Iowa State University showed that students in the sixth, seventh, and eighth grades in Iowa held many misconceptions about agriculture ("Students," 1993). Holz-Clause and Jost (1993) found that (1) youth equated agriculture with farming; (2) youth had little understanding of the technical side of agriculture; (3) some (urban) youth were ignorant of agriculture and wished to remain so; (4) most youth were generally aware of the importance of agriculture in regard to food production but there was only an association with cereal products and vegetables and no mention of meat, milk, and other agricultural products; and (5) many youth viewed farmers as men who were old, smelly, dirty, and chewed on a straw wearing overalls. These findings are

surprising and alarming considering that Iowa is one of the top three agricultural states in the nation (Kiplinger Washington Editors, 1994) over twenty percent of the workforce is directly involved in agriculture, and an additional fifty percent of the workforce jobs are indirectly related to agriculture (Iowa Farm Bureau Federation, 1997).

Recent Efforts of Agricultural Awareness

Agricultural awareness efforts are being conducted by many different groups, businesses, and people. The researcher has highlighted a few of these efforts, especially those efforts that have been done in Iowa. This is an abbreviated list of examples and the researcher did not intend to overlook any efforts or activities that were not mentioned.

Land Grant University Agricultural Awareness Programs

Several universities have sponsored summer institutes for educators across the disciplines in the elementary and junior high grade levels. Michigan State University offered a summer institute called, "Understanding Agriculture: New Directions for Education." This summer institute was designed to teach K-12 educators in science, math, social studies and other subjects how to teach using resources from agricultural, natural resources, and food industries. This program experienced a 300% increase in enrollment in three years (Moore, 1993).

Iowa State University has offered the Teachers' Academy on Agricultural Awareness for elementary and junior high teachers since 1992. Dr. Robert Martin, professor in the Department of Agricultural Education and Studies at Iowa State University, has coordinated 2½ days teacher academies on agricultural awareness. The commodity organizations, county Farm Bureaus, and the Iowa Farm Bureau Agricultural

Leadership Foundation helped sponsor the academies by providing scholarships for teachers to attend the workshops on agricultural awareness. The teachers learned about agriculture and resources available to help them teach about agriculture. The academy helped teachers integrate agricultural examples and materials into existing science, math, social studies, and other classes. The idea for the academy came about in a meeting of CAIP members as they were brainstorming ways to improve the relationship between farmers and consumers, with an emphasis on school-age children ("Agricultural Academy," 1994).

The California Foundation for Agriculture in the Classroom (CFAITC) sponsored the Summer Agricultural Institute for educators to spend a week learning about agricultural issues from international trade to biotechnology and interacting in honest and probing dialogue with farmers and ranchers. One teacher who grew up in the urban environment and knew very little about agriculture said that "my interest in agriculture as a dynamic and critical industry soared" after attending the Summer Agricultural Institute. After returning to her classroom Bechely and Linder (1993, p. 19) found that "agriculture was underlying the instruction in language arts, science, history/social science, art, dance, and drama. I had the students engaged in fun, meaningful, and relevant learning experiences, while at the same time I was implementing many new curriculum reforms." Further, Bechely and Linder (1993, p. 20) stated that "by correlating the different strands from key frameworks such as the History/Social Science, English Language Arts, and Science frameworks with an agricultural theme, I was able to validate my belief that studying about agriculture is clearly one of the best ways to integrate subject areas at all grade levels."

Since 1992, more than 300 Illinois educators have completed the Summer Agricultural Institute through Illinois State University, Southern Illinois University, and Western Illinois University. The course is designed for "K-8 educators who wish to expand their curriculum to include topics related to agriculture" (Wood, 1997). Three hours of graduate credit can be earned and the course focuses on how to integrate available resources and hands-on activities about agriculture into the existing curriculum.

Teachers and students in elementary schools are also getting agricultural awareness integration since Michigan State college students have spent time in elementary classrooms assisting urban teachers and students in understanding agriculture and natural resources.

Farm Bureau Organization Agricultural Awareness Activities

State Farm Bureau organizations have been very active in promoting agricultural awareness. In 1989, Jack Parnell accepted President Bush's invitation to become U.S. Deputy Secretary of Agriculture and said, "Think of all the innovative things you can do to help urban America understand what agriculture is and why it is an important part of the economy in this great country" (Burress, 1994, p. 21). Iowa Farm Bureau women are trying to do just that by bringing agriculture into the classroom by having poster contests, visiting classrooms to tell the story of agriculture, and handing out coloring books. Another concern is environmental interests. Parnell said:

> People like to believe the devastating things that newspapers print about an unsafe food supply, when in fact, our food supply is the safest in the world. Ninety-eight percent of the population does not understand agriculture. They are putting pressure on us in the name of the environment. Agriculture is a high risk, sophisticated, highly capitalized business that requires a lot of talent. We have come to a time when we have an affluent society that has migrated away from the farm and ranch. Twenty five percent of the work force depends on agriculture (Burress, 1994, p. 21).

Farm Bureau believes that agricultural people need to be informed and speak out on rural, urban, and environmental issues. The Farm Bureau organizations and members have given time, money, and energy to agricultural literacy thrusts by providing scholarships for teachers to attend in-services and providing lectures and tours of their members' farms. Some specific examples that the Farm Bureau has promoted are:

- Ag. In The Classroom--The program was started in 1982 with the goal to teach elementary students how food is produced by the farmer, processed, and distributed to the dinner table. In Iowa, the Farm Bureau and commodity groups work as a team to raise awareness among school children. Curriculum guides and class booklets make it easy for teachers to integrate agriculture into their lessons. There are 95 out of 99 counties in Iowa that have Ag. in the Classroom coordinators and they have conducted a wide variety of agricultural awareness activities (Lykens, 1997).
- Adopt-A-Classroom--Some farmers have adopted classrooms and make regular visits to explain agriculture, exchange letters, share videotapes of on-farm production, and conduct on-farm field trips.
- County Activities--The Linn County Farm Bureau cooperated with the local high agricultural education class and commodity groups to host a full-scale agriculture field day at a park. The Johnson County Farm Bureau cooperated with the local FFA chapter, commodity organizations, and ag-related businesses to host its fourth annual Ag. Festival at the fairgrounds. Both events taught elementary students about agriculture using hands-on activities and educational displays.

- Ag. Treasure Hunt--A contest at the Iowa State Fair where youths had the opportunity to answer questions in a maze about agriculture to receive prizes ("TV viewers", 1994).
- National Cattle Congress--Nearly 1,200 second and third graders learned about the importance of agriculture in our lives by participating in the interactive "Discovery" program at the National Cattle Congress in Waterloo, Iowa ("Improving," 1997).
- Iowa Children's Water Festival--The Farm Bureau Foundation provided materials and funds in conjunction with the "Year of Water Celebration." Fifteen hundred 5th graders learned about Iowa conservation efforts in interactive sessions at the statewide festival in Ankeny, Iowa ("Improving," 1997).
- Speakers Group--The Farm Bureau trained a cadre of 18 farmers and provided them with materials to speak to elementary classes, organizations, and clubs (Lucht, 1993).
- Iowa Welcome Centers--The Farm Bureau distributes coloring books and brochures on Iowa agriculture through Iowa's Welcome Centers ("Improving," 1997).

Coalition for Agricultural Image and Promotion

The Coalition for Agricultural Image and Promotion (CAIP) was established in 1992 with a purpose to conduct agricultural awareness activities and try to change the perceptions of non-farm people. The CAIP's mission statement: "A joint effort of agricultural industries and organizations dedicated to enhancing the perception of agriculture through promotional and educational activities" ("CAIP," 1993). There are

over 20 member organizations including: Agribusiness Association of Iowa; Iowa Agricultural Development Authority; Iowa Association of Electric Cooperatives; Iowa Corn Growers Association; Iowa Department of Agricultural & Land Stewardship; Iowa Farm Bureau Federation; Iowa 4-H Foundation; Iowa Pork Producers Association; Iowa Sheep Industry Association; Iowa State University - College of Agriculture, Department of Sociology, and Extension to Business and Industry; Eastern Iowa DMA; Iowa Beef Industry Council; Iowa Dairy Products Association; Iowa Department of Education; Iowa Egg Council; Iowa FFA Foundation; Iowa/Nebraska Farm Equipment Association; Iowa Soybean Promotion Board; Iowa Turkey Federation; Leopold Center for Sustainable Agriculture; Living History Farms; Midland Dairy Association; and Silos & Smokestacks ("What Is CAIP?," 1995). The efforts of CAIP have focused on teacher training, and elementary agricultural literacy and awareness promotions, resources, and programs.

- Middle School Science Project--This is a new program that is being developed that goes through the entire food production cycle and identifies careers related to the different aspects of the food production cycle (Lykens, 1997).
- the ImAGination station™:Creative Ways to Infuse Agriculture into Your K-6 Curriculum--A resource guide on agriculture that was sent to every (1200) public and private schools in Iowa. There are five thematic approaches for use at each grade level (K - 6), 18 pages of resources section, and a time-coded, 120 minute video of short segments for a variety of lessons (Lykens, 1997).
- Ag. In The Media--A collection of portable displays depicting agriculture and a series of agricultural vignettes on a television station's Saturday program are

helping to tell the agriculture story to non-farmer audiences. The vignettes help kids learn about where their food comes from and the amount of planning and work involved in getting that food from the farm to the kitchen table ("Foundation Helps," 1994). According to Lykens (1994), Agriviews is a non-traditional approach of positive messages about agriculture presented to children watching cartoons. They are fast-paced one minute vignettes that are used to enhance the perceptions of a farmer, horticulture, meats, entomology, and farm safety.

- Totally Kids insert on agriculture--Totally Kids is a quarterly subscription that was sent to 15,000 children in the FOX TV Kids Club. CAIP cooperated with FOX by putting a one page insert on agricultural careers in Totally Kids. This was an 18 month project (Lykens, 1997).
- Kids Fair--A youth fair that was sponsored by FOX TV at Vets Auditorium in Des Moines on a weekend with 2,000 to 3,000 kids in attendance. Since CAIP cooperated with FOX on the 18 month Ag. In The Media project, they had a booth space with an ag. career display, the AgriTwister game, and the AgWalk game.
- Junior Achievement--This was a pilot project for one year in which farmers visited 4th grade classes and taught a unit on business management in some school districts in Iowa. The program taught record keeping, marketing and production, agricultural products, and respect for the farming industry.
- Henry A. Wallace Crops Center--CAIP and the Living History Farms have created a public educational theater program that highlights major innovations in farming from the 1920s to the 1990s with a look at changes in the future. CAIP developed a

video --Since Yesterday: Agriculture in the 20th Century--that was shown in the center that illustrates the current agricultural industry in Iowa. The Henry Wallace Crops Center reaches a large general audience of 155,000 including 100,000 children in one year.

- Iowa Kids Love Iowa Foods--This program was used by teachers and food services in over 300 Iowa schools to help children appreciate where food comes from.
- Food For Life--A newspaper supplement done by CAIP and the Des Moines Register distributed to 20,000 middle school students in October, 1995. The 16 page supplement contained information and activities pertaining to agriculture and the food industry was distributed to Iowa schools participating in the Des Moines Register's Newspaper in Education program. Students received their own special supplement which tied learning activities to the daily paper and taught students about Iowa's food industry, where food comes from, and using the food guide pyramid to make good food choices (Tasty News, 1995).

The National FFA Organization

- Food For America--Since 1975, the National FFA Organization has offered a national program named, Food For America. According to Dubes (1985, p. 15), this "program seeks to communicate to elementary students a fundamental, yet broad, understanding of the American agricultural industry." The program teaches younger student the true basics about agriculture being taught by high school FFA members. The benefits are for both ages of students. The younger students pay close attention and learn a lot from the older students. The elementary teachers also

learn from the presentations. The FFA members gain leadership experience and confidence by selling agriculture. This program provides resources and students to incorporate agriculture into elementary classrooms (Dubes, 1985). This was one of the first national programs to integrate agriculture into the elementary grades. The program has been very successful among the FFA chapters that have effectively implemented the program, however, this program has reached a small percentage of elementary students since less than 5 percent of the high school population may be enrolled in a 3 or 4 year agricultural education program (National Research Council, 1988).

- Project PALS--This program creates partnerships between high school FFA members and elementary students. The main goal is that the FFA member builds a relationship with the elementary student using many different types of activities which are usually related to agriculture.

Examples of Agricultural Awareness Programs Conducted by Schools

Some schools and teachers have taken the initiative to make a difference in their curriculum by integrating agriculture into their classes. Kenwood Elementary and Mid-Prairie Junior High in Iowa and El Paso Community School in Illinois are a few examples of how agriculture has been integrated into the schools' curriculum.

- Agricultural Field Trips--Kenwood Elementary First Grade visited a farm nearby Marion/Cedar Rapids with teacher, Jane Weaverling, who developed the project as a way of giving the students hands on experience with their school subjects and raising awareness about agriculture. "I think that kids living in an agricultural state

should know about their state and what drives the economy. I grew up on a farm and never really appreciated all that is involved. However, most of these kids don't know anything about farms and have never been on one" (Bodecker, 1994).

- Ag-Life Science Course--Mid-Prairie Junior High School in Kalona, Iowa has implemented an innovative approach to increasing agricultural awareness at the seventh grade. The agriculture teacher and life science teacher team teach a new course called "Ag-Life Science." The course teaches life science concepts and applies them in agricultural settings and laboratories (Foster and Knobloch, 1994). Yates (1994, p. B1) reported that "we have found that it get the kids really enthused," according to Jeff Foster, Life Science Teacher. "It provides an overview of everything that's going on in science. Everyone has eaten chicken and everyone has an egg. Farming is a very important aspect of these kids' lives," commented Foster. One student said that he knew nothing about farming until he took the Ag-Life Science class; he acknowledged that it's important since that's where most of the money and stuff comes from (in Kalona, Iowa). Another student said that she thinks the class is valuable, but takes a more holistic view of farming: "I think it will be good to know when I grow up because a lot of things have to deal with agriculture." Yates (1994, p. B1) reported that according to the Agriculture Teacher, Neil Knobloch, "If these students are going to live or work in Iowa, the majority of them are going to work in some area of agriculture; even if they don't work in agriculture, just by living in an agricultural state so much of the community is affected by agriculture that knowing about it is useful."

- Agricultural Awareness at El Paso--The agriculture teacher at El Paso High School has developed an agricultural awareness program where the agriculture teacher team teaches with elementary teachers and once a week teaches agricultural topics through discussions and activities to the 4th graders. According to Steiner (1997), the elementary teachers just love the program and the program has accomplished the objective of teaching agricultural awareness to elementary students.

The Cooperative Extension Service

The Michigan Cooperative Extension Service provides agricultural literacy materials for teachers and workshops for school administrators. W.K. Kellogg Foundation has spent over a million dollars to fund an education program using food systems resources to improve elementary childrens' science test scores.

The 4-H Youth Program through the Cooperative Extension Service also provided agricultural awareness resources and programs.

Agricultural Commodity Organizations

Commodity organizations in Iowa have developed educational materials and resources about agricultural commodities. Lucht (1993) reported that most of the commodity organizations are stepping up agricultural awareness programs in schools because the children represent the future. Among some of the commodity organizations that have education programs and resources for elementary schools are: The Iowa Corn Promotion Board, Iowa Farm Bureau Federation, Iowa Pork Producers, Iowa Sheep Industry Association, Iowa Beef Industry Council, Midland Dairy Association, Iowa Egg Council, Iowa Turkey Federation, and the Iowa Soybean Promotion Board. These

organizations have developed videotapes, posters, handouts, worksheet activities, and educational resources to help elementary teachers integrate agriculture into their classrooms. Also, the national associations for beef and pork have interactive educational sites on the world wide web.

Forestry and Horticulture Related Educational Programs

- Smokey The Bear--an educational character has been used to teach children about the effects of forests fires and management concerns of forests since 1947.
- Trees Forever--an educational program that teaches students about Iowa forests and how to care for trees.
- Horticultural Growers--the strawberry growers, for example, have developed educational information and packets about raising strawberries. Other fruit and vegetable growers have developed or are developing educational resources.

Farm Safety Programs

- Farm Safety 4 Just Kids--A non-profit organization that provides educational resources and support for safety programs that relate to agriculture.
- Farm Safety Day Camps--These farm safety education programs are conducted throughout Iowa through cooperative efforts of the extension service, hospitals, FFA chapters, 4-H clubs, agricultural businesses and organizations. Grants from Blue Cross/Blue Shield helped fund some of the camps.

Project Food, Land, and People

- Project Food, Land, & People (FLP) is a national program that in-services teachers and provides interdisciplinary, supplementary, and environmental education

curriculum about agriculture and natural resources. The program is designed for educators and resource specialists who teach grades kindergarten through grade twelve (Brickell, 1996). The creation of Food, Land, and People began in Colorado after the development of Project Learning Tree. The Colorado Ag in the Classroom Task Force suggested that "a conservation guide on food and fiber and land use" be put into a format that was attractive and usable by teachers. The task force recognized an abundance of available information from state agencies, federal agencies, and private groups. However, they felt that much of the food and land information was too fact-oriented. Therefore, the Colorado Task Force decided to develop the FLP project into a national project in 1987. Coincidently, the National Research Council's report, "Understanding Agriculture" was released at about the same time that the FLP project originated and helped confirmed the Task Force's belief regarding increased literacy about agriculture (Williams, 1996). The United States Environmental Protection Agency funded a national training of environmental education leaders to help build state coalitions in delivering environmental education products and services to the public (Brickell, 1997). The National FFA Organization and Food, Land, and People have signed a memorandum of agreement to improve coordination, collaboration, and planning of agricultural literacy initiatives (Staller, 1997).

Agriculturally Based Curriculum (ABC) in Science

- The Sanilac County Intermediate School District (SISD), an educational service agency serving seven local school districts in rural Michigan developed an

innovative elementary agriscience curriculum development program that incorporates agricultural themes and existing agricultural awareness materials into the existing elementary science curriculum. The A.B.C. in Science Program provides in-service programs for teachers to facilitate instruction on integration of agricultural themes into the science classes (Trexler, 1994).

Silos and Smokestacks

- Silos and Smokestacks--This project is a heritage park that shows how farming has combined with manufacturing to create the agricultural industry in the area. They use educational demonstrations to teach agricultural concepts ("Foundation Helps," 1994).

Media Resources

- On The Grow Newsletter--A publication sent three times per school year in the fall, winter, and spring. The newsletter has a weekly reader format and focuses on careers, a science related activity, recipes, and an art-type activity. A supplement is sent for the teacher called Teacher Tips. The newsletter is sent to over 17,000 second graders and is sponsored by the Iowa Farm Bureau, Iowa Soybean Association, Iowa Corn Promotion Board, and the Iowa Beef Council (Lykens, 1997).
- Agriculture In Black and White--Another medium that has been used to promote agricultural awareness is newsprint. "Agriculture In Black and White" was a newspaper developed for elementary teachers to use as an agricultural resource in the classroom (Coon and Cantrell, 1985).

- Private Company Produced Resources--Schindler, a mother concerned about her children not being taught agriculture, started a company that produces educational videos on farming for children (Holin, 1995).

Informational Exhibits

- Agricultural Information Displays--Displays on agricultural products have been set up at county fairs, state fairs, and other public functions outside of the formal school setting. Bennett, Keyser, and Yoder (1993) believe that agricultural educators play an important role in educating the general pubic about agriculture through the use of community-oriented information displays.

Perceptions of Agriculture

According to Doerfert (1995, p. 6), "One common trait in these (agricultural literacy and awareness) efforts has been the intent of changing the person's perception about agriculture." According to Glover and Bruning (1990, p. 29), "Perception depends on incoming stimuli, information in long-term memory, and decisions in the working memory." Perceptions about agriculture depends on the accurate images of the incoming stimuli. However, agriculture is not always accurately represented. "Many misconceptions exist about farms, plants, animals, and other aspects of life" (Swan and Donaldson, 1970). During the 1960s and 1970s have been the first time in humankind's history in which an entire nation was more concerned with "too much food" than with "too little food." According to Swan and Donaldson (1970, p. 283):

> Agriculture still is being called a major economic problem and oversupply a national menace. Rank and file Americans do not see farming as one of their most successful industries which it assuredly is, and oddly they do not consider the unique abundance provided by farms to be a blessing.

Moreover, Coon and Cantrell (1985, p. 22) expressed:

> The American public's image of agriculture is a kaleidoscope of leftover attitudes and images of what agriculture was during the 40's, 50's and early 60's. Agriculture has been viewed as farming with no understanding of the impact of agriculture on other sectors of the economy. The public views the agriculturalist as a producer of food with little need for technical know-how. Consequently, agriculture is not viewed as a glamorous occupation.

Another example that misrepresented agriculture appeared in the Wall Street Journal. Kilman descriptively reported the hog production issue in Iowa as dividing the small communities regarding the odors and zoning rights. Kilman (1995, p. A1) described the application of hog manure on the fields with the following statement, "Outside them (hog confinements) lie huge waste lagoons, some emptied by 'manure guns' that fling their cargo through the air onto the surrounding field--and occasionally onto passing cars." This type of biased reporting to a large audience of business people gave an unrepresentative picture of the agricultural production system.

Consumers react to scare stories related to agriculture very quickly (De Christopher, 1993). Although farmers might not be directly responsible for an incident, their financial bottom line can be harmed when consumers change their eating habits based on real or perceived health threats. The agriculture community needs to educate the non-farm sector in advance rather than being defensive when reacting to incidents. People don't want to read a lot of things or invest a lot of time in understanding something that is as complex as agriculture (De Christopher, 1993). Zinkand (1993) reported that agriculture holds the key to comprehensive environmental enhancement by educating the non-farm sector to understand environmental conservation practices. Urban residents will support conservation efforts if they understand agriculture and realize that farmers are adopting

environmentally sound practices. We should be allies and not combatants with the urban population (Zinkand, 1993).

What has been the effect of what has been done? The efforts of agricultural awareness and literacy have been qualified by elementary teachers and professionals in agricultural education. However, little data, if any, exists in quantifiable form.

A number of school districts in Michigan have viewed the agricultural literacy thrust as a viable means of enhancing students' learning of basic academic subjects (Moore, 1993).

According to Doerfert (1995, p. 6), "The resulting efforts have varied from state to state and school district to school district in scope, content, target audience, duration and undoubtedly, effectiveness. Many of these efforts focus on putting agriculture information in the hands of the non-agriculture person." Reflecting on the progress of agricultural literacy 5 years after the National Research Council issued a huge challenge to the agricultural education profession to provide agricultural literacy programs at all levels of education, Osborne (1993) commented that we have responded with very successful agricultural literacy initiatives in grades K - 6 and we should be proud of our accomplishments in this area over the past 5 years.

Furthermore, Lykens (1997) feels that the agricultural literacy and awareness programs in Iowa have made a difference in teaching students about agriculture as they will someday be consumers, legislators, or restauranteurs. Lykens has been encouraged to see more interest in agricultural awareness in the past 3 years since she has been involved in promoting agricultural awareness in Iowa over the last 13 years. Lykens (1997) believes

that the Teachers' Academy and the ImAgination station™ have been the most effective efforts that CAIP has done because the elementary teacher are getting resources and instruction on how to use them in their classes. More networking among elementary teachers and people in agriculture at the local level have occurred because of the scholarships that the county Farm Bureau organizations and local agricultural commodity groups have provided for teachers to attend the Teachers' Academy at Iowa State University.

However, providing agricultural resources and materials is not enough to change the knowledge and perceptions of elementary students. For example, the beef industry has been supplying teachers with materials that help educate students at all grade levels since the early 1920s ("Educators Find," 1997). Incidently, the American Dietetic Association and the International Food Information Council researchers found that students are aware that balanced diets are very important. About 97 percent of the students between the ages of 9 to 15 in a Gallup survey agreed that a balanced diet is very important for good health. However, a recent Bruskin/Goulding survey found that only three percent of the students in grades 3 - 12 agree that beef is part of a balanced diet. In addition, only seven percent of the students thought that beef was good for you and only 32 percent said that they could not think of anything positive about eating beef ("Educators Find," 1997). The commodity organizations have developed and sponsored some excellent resources respective to promoting their industries. This evidence shows that there is a need for in-service programs ard that education influences perception.

Trexler (1994) supports this evidence since he believes that there are four key

components to institutionalize agriculture into the elementary curriculum: (1) educators must agree upon cross-curricular interdisciplinary connections, (2) gain agricultural knowledge, (3) learn to use the new resources and hands-on activities, and (4) develop supportive networks. Moreover, Texler (1994) commented that all of these components require tremendous effort, input, and cooperation from teachers, administrators, and the community. Few agricultural literacy efforts provided the time required for capacity-building which became their downfall; teachers who were directly involved in curriculum development were more likely to use the curriculum materials (Texler, 1994).

Related Information

Perceptions about agriculture can be changed if agricultural sector gives the non-agriculture sector experiences that are first hand and positive. An adult education effort to educate non-farm adults about agriculture and the conservation efforts of farmers through four seasonal workshops has been done by the Johnson County Soil and Water Conservation District in Iowa through a program called the "Non-Farmer's Guide to Agriculture". The program's mission is to provide exposure to the non-farm sector on the economic, environmental, and cultural contributions of agriculture and foster rural-urban partnerships (Johnson County Soil and Water Conservation District, 1995). The program had a very positive response from its non-farm participants from the Iowa City, Iowa area. According to the Johnson County Soil and Water Conservation District (1995), a couple of participants shared their feelings after participating in the Non-Farmers Guide To Agriculture workshops:

> Sometimes the urban sector is so isolated from the rural sector of our society that agricultural issues are somewhere 'over there.' These issues touch all of our lives.

> Educating urban dwellers will help us appreciate the important part the farm sector has in our very basic needs of life--food and water. Hopefully we can work together for the good of all.

Further, the second participant added her testimony:

> As a passenger in a combine--the enormity of the incredible machine, the magical mechanical capability of reducing the crop to a bin of golden kernels while mulching the field...there is no way the non-farmer can perceive the experience or understand the range of comprehension a conservation-minded farmer masters to make a living, except by being there. Seeing it all happen makes all the difference.

Some professionals that work in the medical and health field have not received much education or instruction to help patients know about good nutrition. Specifically, a variety of foods, including milk and meat, have health benefits and are critical food products to their diets. For example, Lucas (1997) reported that health care doctors are interested in nutrition, but some say that they had very little education on it while they were in medical school. The dairy, beef, and pork industry organizations are helping to fund a University of Iowa project to integrate nutrition into the medical education curriculum.

Agricultural education and elementary education teachers who have worked together have discovered what one might call a missing link in educating elementary students. Students who understand agricultural concepts will be more successful in thinking critically, making better decisions, and applying the knowledge they understand. Elementary educators have experienced better education by using agricultural topics and activities to apply the concepts they have traditionally taught for many years. Agricultural activities bring the learning process to life in the minds of the students. Also, agricultural teachers enjoy the benefits of linking agriculture in elementary classrooms by seeing

students, parents, and teachers valuing agriculture. Good decision-making involves gathering all pertinent information and evaluating all alternatives before making a decision. Students who have been taught agricultural concepts throughout their elementary years will, thus, make better decisions about their academic and career choices.

Bechely and Linder (1993, p. 20) reported some essential comments of an elementary teacher who grew up in and now teaches in the urban environment:

> I have often been asked how I would interest other teachers in teaching about agriculture. First, I would define all that agriculture is, since this is an area that most urban dwellers know very little about. I would challenge teachers to do a critical analysis of the history of agriculture from the global to the local perspective. To this I would add a scientific challenge to the misinformation that exists about agriculture and encourage teachers and students to search for honest representations. Agriculture can capture the interest of teachers by offering a strong, rigorous, content-based curriculum. Agriculture must support teacher training and curriculum development about agriculture as part of its vision for the future. Finally, the entire agricultural industry and education family need to share their work with teachers and students in the classroom.

However, some of the educational materials and resources are not necessarily accurate. Grace McReynolds (1985), representing the Missouri Department of Education, reviewed children's material relating to agriculture and found some misrepresentations. She found picturesque, but not necessarily realistic material. Little material emphasized the public dependence on American agriculture. Further, no materials dealt with the business needs of the farmer cooperating with others, depending on others to get crops to markets, and buying new machinery. The materials lacked in explaining how specialized farmers are in producing their products. Also, there was no mention of farmers depending upon the weather and soil quality for an abundant harvest (McReynolds, 1985).

On the other hand, some elementary teachers have said that the materials developed

and provided by agricultural-based groups are biased and misrepresentative of the real issues in our society. Agriculture is faced with many issues and the controversy over who perceives what is right and wrong about the issue is the underlying problem of the issues that are agricultural related.

Research Questions

There are many anecdotes and examples of success stories about the integration of agriculture into elementary classrooms in many different states. However, the researcher was concerned that many elementary teachers were not relating their subject matter to real-life and practical examples that were food, natural resources, and agricultural related. Therefore, the questions that drove the research for this study were: (1) What do elementary teachers think about agriculture?; (2) What activities are conducted by elementary teachers in the grades K through 6th?; and (3) What do elementary teachers think about integrating agriculture into their curriculum?

Summary

The demographics of our nation are changing. Fewer people and families are involved in production agriculture, yet there is a growing demand for more people to work in the agricultural industry. Agriculture is the largest industry in America and people make decisions that they need knowledge about agriculture to help promote an efficient, safe, and abundant food supply.

Perceptions and knowledge are learned at a very early age. The need for agricultural awareness and literacy is important starting at preschool years and continuing on through elementary, middle, and secondary educational levels since agriculture is so

prevalent in many decisions and situations in every person's life. Teachers have the most influence on what subjects are taught and how they will be taught, therefore, they need to be educated and equipped with the appropriate resources so they can integrate agriculture into their existing classes.

CHAPTER III. METHODS AND PROCEDURES

Introduction

This study was a descriptive study utilizing a survey instrument. The scope of the study focused on elementary teachers who teach in schools served by the Grant Wood Area Education Agency (AEA) in Iowa. Any conclusions drawn or inferences made were confined to this group.

Purpose

The overall purpose of the study was to identify the perceptions held by elementary teachers in the Grant Wood AEA in Iowa regarding the integration of agricultural topics and activities into the elementary curriculum. Further, the study identified how frequently elementary teachers conducted specific agricultural activities listed in the survey instrument. Since agriculture is a major part of our state's and nation's economy, workforce, social network, and political structure, it is imperative that students at all levels, including elementary grades, are taught agricultural activities to prepare them for decisions and situations that will affect the food and fiber system. This study was an attempt to identify and define strengths and weaknesses of the agricultural awareness activities that are being conducted in some of the elementary schools. The study also sought to measure the degree of acceptance of integrating agriculture into the elementary curriculum. The researcher attempted to recommend a model for infusing agricultural awareness into the educational system of Iowa. This model may also serve as an example that other states may use to design their delivery system and curricula that will integrate agricultural awareness activities.

Design of the Study

This study began with the development of a questionnaire. This was a base-line descriptive study since the researcher did not find any studies of this nature that addressed agricultural awareness at the elementary level. The instrument was designed to be completed within 10 to 15 minutes because of the busy schedules of the teachers. The questionnaire was outlined to study four areas: (1) Views on integrating agriculture into elementary classes; (2) Agricultural activities in the classroom; (3) Comments regarding your thoughts on teaching agriculture; and (4) Demographic information. Once the outline of the survey instrument was designed, the researcher developed perception statements that were included under the views about integrating agriculture into the elementary curriculum. The researcher along with the assistance of the Dr. Robert Martin, developed statements that were positive and negative to check on content validity. Further, the researcher used elementary agricultural awareness activities manuals that were developed by elementary teachers who participated in the Iowa State University Teacher's Academy on Agricultural Awareness to develop the list of agricultural activities that were listed in the survey. Once the survey was developed, several professionals in elementary education at a Food, Land and People Workshop; a school superintendent; and, a professional accountant evaluated the survey and gave feedback on items and suggested ways to improvement it. The researcher collected the evaluation responses, studied the comments, and made further revisions to the survey to establish face and content validity. The cover letter, survey, and application were reviewed and approved by the Iowa State University Human Subjects Committee prior to sending the instrument to the survey participants.

At this point, the instrument was used to survey a sample of elementary teachers who taught in the schools served by the Grant Wood AEA. The Grant Wood AEA is an educational service area for subscribing public and private schools in a seven county area in Eastern Iowa. The counties served are Benton, Cedar, Iowa, Johnson, Jones, Linn, and Washington.

Population and Sampling Procedure

The target and accessible populations consisted of all elementary teachers of grades K through 6th in the schools that are served by the Grant Wood AEA via the van mail delivery system. The Grant Wood AEA mailing list served as the population frame. A randomly stratified pool was selected consisting of 689 teachers which is approximately one-third of the total 2,000 elementary school teachers in the Grant Wood AEA. The researcher selected every third label from the mailing list. The researcher's goal was to receive 322 surveys based on a sample population of 2000 (Berdie et al., 1986). The elementary teachers surveyed within this geographic area were the units of analysis. A cross sectional survey was conducted of the selected sample to describe the larger population of elementary teachers in east central Iowa.

An equal-probability-of selection method (EPSEM) sample of 689 teachers was selected using a systematic sampling method with a list of teachers, alphabetized by school district, and selecting every third name.

After 689 teachers were selected for the sample, they were sent a printed survey along with a cover letter via the Grant Wood Van Mail Service. Approximately ten days later, a postcard was sent to the survey participants who did not respond. The final

response rate was 311 out of 689 for 45.1%. However, only 281 surveys were used in the final coding because some were returned blank or incomplete.

Methods of Data Collection

The method of collecting the data for this study was conducted by a self-administered questionnaire that was written by the researcher. The questionnaire addressed the knowledge and perception of elementary teachers about agriculture and the extent to which agricultural awareness activities have been conducted by elementary teachers. The survey instrument utilized a Likert-type scale with points ranging from "strongly disagree" to "strongly agree" as a method of obtaining data for Part A: Views of Integrating Agriculture into Elementary Classes. A list of 31 statements were compiled and listed in Part A of the survey instrument. Respondents were asked to rate each of the 31 perception statements using a number ranging from SD (1) to SA (5) using the following scale: SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree. The scale was used to collect information regarding knowledge and perceptions about integrating agriculture into the elementary curriculum.

Further, the survey instrument utilized a Likert-type scale for determining the frequency of agricultural-related activities conducted by the teachers in Part B: Agricultural Activities in the Classroom. There were 48 activities compiled and listed in the survey with 3 open lines for additional activities that were not listed. A scale was used to determine the number of times instructors used the activities in their classrooms over the past school year. The respondents were asked to use a 4 point scale ranging from 0 to 3 to respond to the frequency of using the 48 activities listed during the school year: 0 = never,

1 = once a year, 2 = twice a year/once per semester, 3 = three or more times a year.

In Part C: Other Comments Regarding Your Thoughts on Teaching Agriculture, the teachers were asked to respond to the following open-ended question about their thoughts or ideas about teaching agriculture in the elementary classes: "What are your thoughts or ideas regarding the integration of teaching agriculture in the elementary curriculum?"

In Part D: Demographic Information, the survey contained 10 demographic data questions for the purpose of defining the sample of respondents and conducting bi-variate comparisons. Examples of these data included grade levels, subject matter areas, years of teaching experience, educational level, gender, type of community, agricultural-related classes, agricultural-related experience, district has a secondary agriculture teacher, and size of school district.

Space was provided throughout the survey instrument for respondents to list additional activities or information to provide more appropriate information. The survey also allowed the respondents to respond to the open-ended question about their thoughts and ideas about integrating agriculture into the elementary curriculum.

The sample of teachers were mailed a cover letter, survey, and postage-paid/pre-addressed return envelope via the Grant Wood Van Mail Service on May 1, 1996. The teachers were asked to complete and return the survey to the researcher within two weeks by May 17, 1996 via the United States Postal Service. The respondents were provided with a pre-addressed and postage-paid envelope to conveniently mail the completed survey to the researcher. A postcard was sent 10 days after the initial mailing to remind the non-

respondents to complete the survey. An additional 10 percent of the surveys came in after the reminder was sent to the non-respondents.

Analysis of Data

The data for this study were analyzed by descriptive and inferential statistical procedures. The researcher used a computerized spreadsheet software program, Quattro Pro version 6.0, to compute the descriptive statistics. Descriptive statistics were utilized for items in Part A and Part B of the study. Frequencies, means, standard deviations, and percentages were reported. Descriptive statistics were used to answer the first and second research objectives. Further, inferential statistics were used to determine if correlations existed among the some selected demographics and items in Part A and Part B to answer the third research objective. The researcher looked at each questionnaire to observe reporting differences in how the respondents answered the questions.

Non-response error was controlled by contacting 5 percent of the non-respondents and comparing their responses with those already received. Summated means of ten selected survey instrument constructs were compared. An analysis of variance indicated no significant differences between responses obtained from respondents and non-respondents allowing generalization from the respondents to the sample and target populations.

The estimates of reliability, using Cronbach's alpha method, were calculated at a range of coefficients ($r = 0.89 - 0.94$) for Part A of the study and ($r = 0.86 - 0.94$) for Part B of the study.

Limitations of the Study

Although the geographic sample has a diverse mix of schools sizes and rural/suburban locals, there is no guarantee that this sample is perfect representation of the population. Further, there was some evidence to suggest that the mailing roster used may not have been current and accurate. The researcher found that some teachers had moved, retired, or died and the mailing roster had not been completely updated. However, this did not necessarily result in sampling error but rather a lower response rate. The response rate was 45.1 percent which could have been higher, but there were a large enough number of respondents (n=281) which reduced the possibility of sampling error.

The time of the year could have been a limitation since it was done within the last month of the school year. This could have resulted in more teachers not having the time or patience to complete the survey.

There was no evidence to show this limitation but systematic sampling method of selecting the participants could have been a limitation.

The survey instrument's format of front and back, stapled pages with page numbers at the bottom of each page could have been a limitation since a few survey instruments were not completed on both sides of the pages.

There could have been a limitation on how the demographic information on years of experience, subjects taught, or size of school district were collected and summarized. Further, the agricultural awareness activities may not have been inclusive of all subject matter in the grade levels of kindergarten through sixth grade.

This was an exploratory study and the researcher was trying to point to future

research which in itself may have been limiting since it was a baseline study and no recent studies had been conducted of this nature.

Assumptions

The researcher assumed that the respondents answered the questionnaire truthfully and honestly.

The researcher assumed that the mailing list was current and accurate that included elementary teachers who taught grades K - 6.

The researcher assumed that teachers knew a general definition of agriculture.

The assumption was made that the activities listed in the instrument were currently being used in the elementary classes. Further, the researcher assumed that the activities included in the instrument were representative of the opportunities to integrate agriculture into the various elementary subject areas.

CHAPTER IV. REPORT OF THE FINDINGS OF THE STUDY

The purpose of this study was to analyze the status of agricultural awareness efforts in elementary (K through 6) grades in a selected area of Iowa and create a model of agricultural awareness for the community education system. There were four primary objectives of this study:

(1) Identify elementary school teachers' perceptions regarding issues related to agriculture.

(2) Identify the extent to which agricultural awareness activities are conducted in elementary school classrooms.

(3) Compare selected demographic data with perceptions and activities of elementary school teachers in east central Iowa.

(4) Develop a model for delivery of agricultural awareness programming.

In this chapter, the results are reported in the following sections: (1) response rate of the study; (2) demographic information of the elementary teachers and schools; (3) views on integrating agriculture into elementary classes; (4) agricultural activities used in the classroom; (5) correlations of selected demographic data; and (6) comments made by elementary teachers regarding teaching agriculture.

Rate of Response

The survey was sent to 689 elementary teachers. Three hundred eleven surveys were returned within six weeks resulting in a forty-five percent response rate. However, some of the surveys were returned incomplete or partially completed and thus, two hundred eighty-one surveys were used in the final composite of the data. This was 40.78% usable

response of the original sample. A postcard was sent to 69% of the teachers after ten days of the initial mailing of the surveys; an additional 9.9% of the surveys were received after the postcard was sent. Table 1 indicates the percent of response of the surveys over the six week period.

Demographic Information of Elementary Teachers and Schools

The elementary teachers of the schools surveyed in the Grant Wood A. E. A. ranged in experience from beginning teachers with zero to seven years of experience to career-long teachers with over twenty-two years of teaching experience. The teachers taught elementary grades from kindergarten to sixth grade. Forty-two percent (n = 141) of the respondents taught the lower elementary grades of K through 2nd; twenty-nine percent (n = 96) taught the middle grades of 3rd through 4th; and, twenty-nine percent (n = 97) taught the upper elementary grades of 5th through 6th. The elementary teachers taught a wide array of subjects including: Language Arts, Social Studies, Geography, Math, Science, Health, Art, Music, Reading, Personal Development, Physical Education, Religion, Special Education, Spelling, Talented and Gifted, Writing, Remedial Reading, Computer, Penmanship, Integrated Curriculum, Self-Contained, and Speech Therapy. Fifty-nine teachers (19%) had taken an agricultural-related class, workshop, or in-service. Over half (51%) of the teachers had mentioned that they have some agricultural experience. Forty-one elementary teachers (14.6%) had taken agricultural classes, workshops, or in-service programs. Two hundred twenty-six elementary teachers (69.0%) said that they had agricultural experience. Two hundred one elementary teachers (59.7%) said that they had an agriculture teacher in their school district.

Table 1. Response rate of survey participants

Week	No. Of Surveys Returned	Percent Returned
1	147	47.42%
2	90	29.03%
3	46	14.84%
4	15	4.84%
5	5	1.61%
6	7	2.26%

The grade levels taught by elementary teachers were divided into kindergarten through second grade; third to fourth grade; and fifth to sixth grade. Many teachers taught more than one grade level and more than one subject in the elementary curriculum. Table 2 and Table 3 show the number of teachers who taught in each grade level category and the subject categories. The percentages are based on 281 teachers in the sample, thus, the percentages for these tables are greater than 100 percent because of several teachers who taught at more than one grade level and subject category.

The years of teaching experience of the teachers in the sample were fairly evenly distributed among the categories of every seven years of teaching experience (Table 4). Further, the teachers' education level was either a bachelors' or masters' degree; over one-third (n = 103) of the teachers had a master's degree. None of the respondents had a doctoral degree (Table 5). Moreover, over ninety percent (n = 248) of the teachers were female (Table 6). Half of the teachers (n = 136) in the sample believed that they taught in an urban community; one-fourth (n = 67) believed that they taught in a metropolitan community; and one-fourth (n = 67) believed that they taught in a rural community (Table 7).

Table 2. Grade levels taught by elementary teachers

Grades Levels	Count (n = 281)	Percentage
K - 2	141	50.2%
3 - 4	96	34.2%
5 - 6	97	34.5%

Table 3. Subjects taught by elementary teachers

Subjects	Count (n = 281)	Percentage
Language Arts	221	78.6%
Math	208	74.0%
Social Studies	202	71.9%
Science	195	69.4%
Geography	163	58.0%
Health	151	53.7%
Art	59	21.0%
Music	35	12.5%
Other (Table 8)	46	16.4%

Table 4. Years of teaching experience by elementary teachers

Years of Teaching Experience	Count (n = 281)	Percentage
0 - 7	55	19.6%
8 - 14	63	22.4%
15 - 21	67	23.8%
Greater than 22	93	33.1%

Table 5. Education level of elementary teachers

Highest Degree Received	Count (n = 274)	Percentage
B.A./B.S.	171	62.4%
M.A./M.S.	103	37.6%
Ed.D./Ph.D.	0	0.0%

Table 6. Gender of elementary teachers

Gender	Count (n = 275)	Percentage
Female	248	90.2%
Male	27	9.8%

Table 7. Type of communities elementary teachers believed that they teach in

Type of Community	Count (n = 270)	Percentage
Rural	136	50.4%
Metropolitan	67	24.8%
Urban	67	24.8%

Additional Demographic Information

Forty-six teachers (16.4%) listed sixty-seven other classes they teach that were not included in the survey (Table 8). Forty-one teachers (14.6%) mentioned fifty-nine agricultural classes, workshops, or in-service programs that they had taken (Table 9). Two hundred twenty-eight teachers (81.1%) listed 228 agricultural related experiences (Table 10).

Table 8. Other classes taught

Classes	n = 67
Reading/Literature	14
Personal Development/Social Skills/Skills for Growing/QUEST	9
Physical Education	9
Religion	5
Special Ed./Resource/RTP/BD	5
Spelling	5
TAG/Gifted Program	5
Writing/Writer's Workshop	3
Remedial Reading/Title I	3
Computer	2
Library	2
Penmanship/Cursive	2
Integrated Curriculum	1
Self-Contained	1
Speech Therapy	1

School Information

There were sixty-seven school districts represented in the sample population. Thirty-three school districts were public and thirty-four were non-public. The districts in the sample ranged in size from very small with six students to the second largest school district in Iowa with over seventeen thousand students. Table 11 shows the percentage of teachers in the sample according to the size of the school district they teach in. The mean

Table 9. Agricultural classes, workshops, or in-services taken

Classes, Workshops, or In-Services	N = 59
Project Wet & Wild	13
Iowa State University Teachers' Academy	6
Food, Land, and People	4
FFA/Vocational Agriculture	3
Environmental Science	3
Environmental Conferences	3
Project Clean Sweep	2
Botany	2
Horticulture	2
Project Wetlands	2
REAP	2
Elementary Social Studies	1
Kirkwood Swine Farm	1
Project Learning Tree	1
Integrating Science	1
Project L.S.	1
Natural History of Iowa	1
Science Background	1
Fabric/Paper	1
Foss Science Curriculum	1
Non-Farmer Guide Workshops	1
Science Workshops	1
Aquatic WILD	1
Beef Industry Council	1
Seminar on Drainage/Tiling/Groundwater	1
Outdoor Education	1
Junior High Ag. Awareness (1965)	1
Zoology	1

Table 10. Summary of agricultural experience

Experiences	n = 228
Raised, grew up, and lived on a farm.	98
Farm; spouse farms.	28
Relatives or friends farm.	23
Had an job in agriculture.	14
Gardening, horticulture, or landscaping business.	14
Live in a rural, agricultural community.	12
Live on an acreage.	7
Dad had an agricultural career.	6
Husband has an agricultural career.	5
4-H.	5
FFA.	4
Very little or little.	4
Own land.	2
Iowa State University graduate.	1
Tutored a farm boy.	1
Pork Queen.	1
Soil & Water Conservation Education Committee	1
Consumer of agricultural products.	1
American FFA Degree Recipient.	1

size of the school districts in the sample was 5725 students per district. The median size of the school districts in the sample was 1937 students per district. Table 11 lists the demographics of the school districts that were available in the 1995-96 School District Report from the Iowa Department of Education.

Table 11. Number and percentage of elementary teachers according to size of school (n=281)

Size of School (Enrollment)	Count (Teachers)	Percentage of Teachers
1 - 100	4	1.4%
101 - 250	9	3.2%
251 - 500	22	7.9%
501 - 750	20	7.1%
751 - 1000	30	10.7%
1001 - 1500	33	11.8%
1501 - 2000	33	11.8%
2001 - 3000	11	3.9%
3001 - 5000	16	5.7%
5001 - 15,000	44	15.7%
15,001 - 20,000	50	17.9%
not available	8	2.9%

Views On Integrating Agriculture Into Elementary Classes

In analysis of the data, the researcher studied the results for tendencies and trends which seemed to indicate a pattern of agreement or disagreement. Elementary teachers (n = 281) were asked thirty-one statements about their views on integrating agriculture into the elementary curriculum. A Likert type scale of five response points was used: Strongly Disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, and Strongly Agree = 5. Table 12 shows the frequency of teachers' responses by percentages. Table 13 shows the mean and standard deviation of the responses.

The researcher found that elementary teachers believe that agriculture would enhance the curriculum and agriculture can be integrated into several subject matters. The teachers indicated that they felt the knowledge of agriculture was important and agriculture

Table 12. Frequency of responses regarding views of teachers on integrating agriculture into elementary classes (n = 281)

Statement	1(%)	2(%)	3(%)	4(%)	5(%)
Agriculture would enhance the curriculum.	00.00	00.36	02.49	26.69	70.46
Elementary teachers are too busy to teach agriculture.	04.27	37.72	31.32	23.13	03.56
The study of agriculture is a waste of time in elementary education.	22.42	62.99	12.81	01.78	0.00
Basic knowledge of agriculture is important to make daily decisions.	00.36	09.96	31.32	51.25	07.12
Agriculture can be integrated into science.	00.00	01.07	01.07	65.84	33.10
Agriculture can be integrated into language arts.	00.00	02.85	10.32	65.84	21.00
Agriculture can be integrated into social science.	00.00	00.71	02.14	69.04	28.11
Agriculture can be integrated into math.	00.00	02.49	04.63	69.40	23.49
Agriculture can be integrated into art.	00.00	02.49	08.90	69.04	19.57
There is no time to teach agriculture in the elementary curricula.	13.17	45.55	24.91	14.23	02.14
Agriculture is too outdated to be taught in elementary classes.	25.27	62.28	11.39	01.07	00.00
Agriculture can be taught in any subject matter.	00.36	05.34	10.32	64.77	19.22
Administrators support agriculture being taught in the elementary classes.	01.07	07.12	75.80	14.23	01.78
Elementary school teachers are not trained to teach agriculture.	00.00	14.95	18.15	55.87	11.03
Agriculture fits the need of the elementary students.	00.71	07.12	33.45	54.45	04.27
Agriculture includes horticulture and floriculture.	00.00	00.36	08.54	77.94	13.17

Table 12. (continued)

Statement	1(%)	2(%)	3(%)	4(%)	5(%)
Agriculture includes wildlife and natural resources.	00.36	01.07	06.05	78.29	14.23
Agriculture includes forestry and woodlands.	00.36	01.42	05.34	78.65	14.23
Agriculture includes processing food and fiber.	00.00	01.42	04.27	81.49	12.81
There is no future in agriculture.	46.26	46.98	04.98	01.07	00.71
Agriculture is America's largest employer.	00.00	09.25	37.37	42.70	10.68
Agriculture is a highly technological industry.	00.00	01.78	12.10	67.26	18.86
Agriculture is a science-based industry.	00.00	00.71	04.98	73.31	21.00
Agriculture is a competitive business-operated industry.	00.00	02.14	08.90	66.19	22.78
Agriculture is an environmentally-conscious industry.	01.78	08.90	14.59	56.58	18.15
Agriculture has a skilled, educated workforce.	00.00	03.56	19.22	62.99	14.23
Agriculture has a lot of career opportunities.	01.07	07.47	16.37	61.92	13.17
Agriculture has a positive future for people and business.	00.36	06.05	20.64	61.92	11.03
Every elementary students should be taught agriculture no matter what career they want to pursue.	00.71	06.05	32.03	55.87	05.34
Every Junior High/Middle School student should be taught agriculture no matter what career they want to pursue.	00.36	07.47	39.50	45.55	7.12
Every High School Student should be taught agriculture no matter what career they want to pursue.	00.71	11.03	46.26	35.59	6.41

Scale: 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree

Table 13. Means and standard deviations of views of teachers on integrating agriculture into the curriculum (n = 281)

Statement	Mean	SD
Agriculture would enhance the curriculum.	3.80	0.69
Elementary teachers are too busy to teach agriculture.	2.84	0.95
The study of agriculture is a waste of time in elementary education.	1.94	0.65
Basic knowledge of agriculture is important to make daily decisions.	3.55	0.78
Agriculture can be integrated into science.	4.30	0.06
Agriculture can be integrated into language arts.	4.05	0.65
Agriculture can be integrated into social science.	4.24	0.52
Agriculture can be integrated into math.	4.14	0.60
Agriculture can be integrated into art.	4.06	0.62
There is no time to teach agriculture in the elementary curricula.	2.47	0.96
Agriculture is too outdated to be taught in elementary classes.	1.88	0.63
Agriculture can be taught in any subject matter.	3.97	0.74
Administrators support agriculture being taught in the elementary classes.	3.09	0.57
Elementary school teachers are not trained to teach agriculture.	3.63	0.87
Agriculture fits the need of the elementary students.	3.54	0.72
Agriculture includes horticulture and floriculture.	4.04	0.48
Agriculture includes wildlife and natural resources.	4.05	0.53
Agriculture includes forestry and woodlands.	4.05	0.53
Agriculture includes processing food and fiber.	4.06	0.47
There is no future in agriculture.	1.63	0.69
Agriculture is America's largest employer.	3.55	0.80
Agriculture is a highly technological industry.	4.03	0.62
Agriculture is a science-based industry.	4.15	0.52
Agriculture is a competitive business-operated industry.	4.10	0.63

Table 13. (continued)

Statement	Mean	SD
Agriculture is an environmentally-conscious industry.	3.80	0.90
Agriculture has a skilled, educated workforce.	3.88	0.68
Agriculture has a lot of career opportunities.	3.79	0.80
Agriculture has a positive future for people and business.	3.77	0.73
Every elementary students should be taught agriculture no matter what career they want to pursue.	3.59	0.72
Every Junior High/Middle School student should be taught agriculture no matter what career they want to pursue.	3.52	0.75
Every High School Student should be taught agriculture no matter what career they want to pursue.	3.36	0.79

Scale: 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree

is a highly technological, science-based, competitive industry with a positive future and a lot of career opportunities. Elementary teachers viewed agriculture to be more than just production agriculture; they felt that it included horticulture, natural resources, forestry, and food processing. Overall, the researcher found that elementary teachers are positive about agriculture and they see integrating agriculture into the elementary curriculum as feasible. However, they did not feel as strongly about every student taking agriculture in the secondary grades.

Agricultural Activities in the Classroom

Teachers were asked to respond to the forty-eight classroom activities listed in part B of the instrument. The teachers circled a zero - never; one - once a year; two - twice a year/once a semester; or, three - three or more times a year. Table 14 shows the frequency

Table 14. Frequency of responses regarding agricultural activities used in the classroom by Grant Wood AEA elementary teachers (n = 281)

Classroom Activity	0(%)	1(%)	2(%)	3(%)
Planted and germinated seeds	23.13	55.16	14.95	06.41
Conducted a field trip of a farm.	63.70	32.03	03.20	00.71
Invited in a guest speaker about agribusiness or farming.	61.92	31.32	05.69	01.07
Colored agricultural pictures.	44.13	29.54	15.30	11.03
Counted seeds of a plant.	43.24	37.37	12.81	06.41
Calculated the area of a field.	75.09	16.01	03.91	04.98
Calculated the volume of a storage structure.	84.34	08.90	03.56	03.20
Discussed an agricultural issue about the environment.	21.71	27.40	21.71	29.18
Investigated or researched an agricultural issue.	56.94	24.20	11.74	07.12
Discussed farm safety.	52.67	29.89	09.96	07.47
Identified the ingredients from a food label.	27.76	36.30	17.44	18.51
Discussed agricultural exported products.	50.89	24.91	11.03	13.17
Made a project using agricultural products.	49.47	24.20	12.46	13.88
Observed farm animals.	54.09	30.25	10.68	04.98
Observed and discussed agricultural machinery.	51.96	32.38	09.61	06.05
Transplanted plants or planted a tree.	34.52	49.82	08.54	07.12
Dissected a flower.	62.99	30.60	04.63	01.78
Identified types of trees in a forest.	42.35	39.86	11.03	06.76
Viewed birds or wildlife.	25.98	40.57	18.15	15.30
Discussed the prices of food.	38.79	26.33	20.28	14.59
Incubated egg and hatched chicks.	83.99	15.66	00.00	00.35
Toured a local agribusiness.	88.26	09.61	01.07	01.07
Observed and recorded weather patterns.	34.52	25.62	12.10	27.76

Table 14. (continued)

Classroom Activity	0(%)	1(%)	2(%)	3(%)
Discussed natural fabric fibers from plants or animals.	44.84	37.37	11.03	06.76
Identified by-products from animals and crops.	33.10	34.52	18.86	13.52
Prepared or processed food products.	39.86	22.06	14.95	23.13
Wrote a poem or story about agriculture.	66.55	21.35	07.12	04.98
Made paper.	72.24	25.62	01.78	00.36
Conducted an agricultural theme poster contest.	84.70	13.88	01.07	00.36
Discussed the affect of weather on crops or livestock.	38.43	34.88	13.88	12.81
Discussed the seasons and agricultural activities.	31.67	29.54	14.59	24.20
Composted plant material.	88.26	09.61	00.36	01.78
Discussed soil conservation.	37.37	29.89	12.46	24.91
Read books related to agriculture.	32.74	29.89	12.46	24.91
Discussed water quality.	34.88	35.23	15.66	14.23
Raised earthworms.	91.46	04.63	02.14	01.42
Discussed the role of food in holidays.	27.76	31.67	16.73	23.49
Identified a healthy diet using the food pyramid.	23.49	29.89	17.79	28.47
Identified foods eaten in other cultures.	25.98	33.45	18.15	22.42
Sang a song with agricultural lyrics.	64.06	18.15	08.54	09.25
Used an agricultural theme in a music program.	87.90	09.25	01.42	01.42
Acted agricultural roles or situation.	80.07	14.59	02.85	02.49
Made a terrarium or enclosed ecosystem.	74.73	20.64	03.91	00.71
Recycled paper and discussed renewable resources.	16.01	23.49	08.54	51.96
Identified insects and their roles in society.	29.89	36.65	16.73	16.73
Played agricultural games.	85.41	09.61	02.85	02.14
Spelled agricultural words.	64.41	17.44	07.83	10.32
Identified the life cycles of plants and animals.	22.78	29.89	25.98	21.35

Table 14. (continued)

Classroom Activity	0(%)	1(%)	2(%)	3(%)
Other	00.00	04.98	02.85	02.49

Scale: 0 = No times a year; 1 = Once a year; 2 = Twice a year/once a semester;
3 = Three or more times a year.

Table 15. Means and standard deviations of agricultural activities used in the classroom by Grant Wood AEA elementary teachers (n = 281)

Classroom Activity	Mean	SD
Planted and germinated seeds	1.06	0.83
Conducted a field trip of a farm.	0.44	0.86
Invited in a guest speaker about agribusiness or farming.	0.46	0.65
Colored agricultural pictures.	0.93	1.02
Counted seeds of a plant.	0.82	0.89
Calculated the area of a field.	0.39	0.78
Calculated the volume of a storage structure.	0.26	0.67
Discussed an agricultural issue about the environment.	1.58	1.12
Investigated or researched an agricultural issue.	0.69	0.94
Discussed farm safety.	0.72	0.92
Identified the ingredients from a food label.	1.27	1.06
Discussed agricultural exported products.	0.86	1.06
Made a project using agricultural products.	0.91	1.08
Observed farm animals.	0.66	0.86
Observed and discussed agricultural machinery.	0.70	0.88
Transplanted plants or planted a tree.	0.88	0.84
Dissected a flower.	0.45	0.67
Identified types of trees in a forest.	0.82	0.88

Table 15. (continued)

Classroom Activity	Mean	SD
Viewed birds or wildlife.	1.23	1.00
Discussed the prices of food.	1.11	1.08
Incubated egg and hatched chicks.	0.17	0.40
Toured a local agribusiness.	0.15	0.46
Observed and recorded weather patterns.	1.33	1.21
Discussed natural fabric fibers from plants or animals.	0.80	0.89
Identified by-products from animals and crops.	1.13	1.02
Prepared or processed food products.	1.21	1.19
Wrote a poem or story about agriculture.	0.51	0.83
Made paper.	0.30	0.52
Conducted an agricultural theme poster contest.	0.17	0.43
Discussed the affect of weather on crops or livestock.	1.01	1.02
Discussed the seasons and agricultural activities.	1.31	1.15
Composted plant material.	0.16	0.50
Discussed soil conservation.	0.96	0.95
Read books related to agriculture.	1.30	1.17
Discussed water quality.	1.09	1.03
Raised earthworms.	0.16	0.72
Discussed the role of food in holidays.	1.39	1.21
Identified a healthy diet using the food pyramid.	1.55	1.27
Identified foods eaten in other cultures.	1.37	1.10
Sang a song with agricultural lyrics.	0.63	0.98
Used an agricultural theme in a music program.	0.16	0.50
Acted agricultural roles or situation.	0.28	0.64

Table 15. (continued)

Classroom Activity	Mean	SD
Made a terrarium or enclosed ecosystem.	0.31	0.58
Recycled paper and discussed renewable resources.	1.96	1.18
Identified insects and their roles in society.	1.20	1.05
Played agricultural games.	0.22	0.60
Spelled agricultural words.	0.64	1.00
Identified the life cycles of plants and animals.	1.46	1.06
Other	1.70	0.86

Scale: 0 = No times a year; 1 = Once a year; 2 = Twice a year/once a semester;
3 = Three or more times a year.

of teachers who responded with a 0, 1, 2, or 3 by percentages. Table 15 shows the mean and standard deviations for the agricultural activities used in the classroom.

Overall, elementary teachers are doing a variety of agricultural activities in their classrooms at least once a year. Over half of the forty-eight activities listed in the survey were conducted by a majority of the teachers at least once during the school year. Major tendencies found among the agricultural activities were that elementary teachers conducted activities that related to issues about the environment, recycling and renewable resources, weather, food, diet, seasons, holidays, birds and wildlife, insects, life cycles, and books. Activities that elementary teachers did not conduct very frequently in their classrooms were often more specialized to a subject or upper grade levels. Some less frequently conducted agricultural activities were calculating area and volume, making paper, conducting a poster contest, composting plant material, raising earthworms, conducting an

ag-related music program, acting agricultural roles, making a terrarium, and playing agricultural games.

Correlations of Selected Demographic Data

A correlation analysis was conducted. The "r" values of the correlation study were low because the parameters of the response quadrants were limited to a few possibilities. For example, a five point response of strongly disagree (SD) to strongly agree (SA) correlated to agricultural experience of yes (1) and no (2) would only have ten (10) exactly placed points on the quadrant. The distribution was inherently spread out over a very rigidly confined area of ten points in the graph. Thus, the researcher highlighted the data that were directly or indirectly correlated with a "r" value of 0.15 or larger since this data is relatively significant compared to the other data in the study.

Correlations of Views on Integrating Agriculture into Elementary Classes

- There was an inverse correlation between teachers who were from larger schools (-0.18), or more urban communities (-0.21), or did not have agriculture teachers in their districts (-0.15) and the statement that "agriculture would enhance the curriculum."
- There was a correlation between teachers who taught in the upper grades (0.18) or were from larger school districts (0.15) and the statement that "elementary teachers are too busy to teach agriculture."
- There was a correlation between teachers who taught in more urban communities (0.17) or had no agricultural experience (0.15) aand the statement that "the study of agriculture is a waste of time in elementary education."

- There was an inverse correlation between teachers who had no agricultural experience (-0.15) and the statement that "basic knowledge of agriculture is important to make daily decisions."
- There was a correlation between teachers who had master degrees (0.15) and the statement that "agriculture can be integrated into language arts."
- There was an inverse correlation between teachers who had no agricultural experience (-0.15) and the statement that "agriculture can be integrated into social sciences."
- There was a correlation between teachers with master degrees (0.17) and the statement that "agriculture can be integrated into math."
- There was an inverse correlation between teachers who taught the lower grades (-0.16) and the statement that "agriculture can be integrated into art."
- There was a correlation between teachers who taught the upper grades (0.16) or in more urban communities (0.16) and the statement that "there is no time to teach agriculture in the elementary curriculum."
- There was a correlation between teachers with no agricultural experience (0.19) and the statement that "agriculture is too outdated to be taught in elementary classes."
- There was an inverse correlation between teachers who taught in larger school districts (-0.16) and the statement that "administrators support agriculture being taught in the elementary classes."
- There was a correlation between teachers with no agricultural experience (0.17) and the statement that "elementary school teachers are not trained to teach agriculture."

- There was an inverse correlation between teachers who taught in more urban communities (-0.19), or had no agricultural related classes (-0.15), or had no agricultural experience (-0.17) and the statement that "agricultural fits the needs of the elementary students."
- There was an inverse correlation between teachers who have not taken agricultural related classes and the statements that "agriculture includes horticulture (-0.15), or natural resources (-0.16), or forestry (-0.18)."
- There was an inverse correlation between teachers who have no agriculture teacher in their district and the statement that "agriculture is a highly technological industry (-0.15) or agriculture is a science-based industry (-0.19)."
- There was an inverse correlation between teachers who taught in more urban communities (-0.21), or had no agricultural experience (-0.15), or had no agriculture teacher in their school district (-0.15) and the statement that "every elementary student should be taught agriculture no matter what career they want to pursue."
- There was an inverse correlation between teachers who taught in more urban communities (-0.15) and the statement that "every junior high/middle school student should be taught agriculture no matter what career they want to pursue."

Correlations of Agricultural Activities in the Classroom

- There was a correlation between teachers who taught upper elementary grades and the use of the following activities: calculated the area of a field (0.46), calculated the volume of a storage structure (0.31), discussed agricultural exported products

(0.29), discussed the prices of food (0.29), or discussed soil conservation (0.25).

- There was an inverse correlation between teachers who taught upper elementary grades (these activities were more likely to be conducted by lower elementary grade teachers) and the use of the following activities: planted and germinated seeds (-0.19), invited in a guest speaker about agriculture (-0.19), colored agricultural pictures (-0.37), observed farm animals (-0.36), observed and recorded weather patterns (-0.31), prepared or processed food products (-0.21), read books related to agriculture (-0.30), discussed the role of food in holidays (-0.21), sang a song with agricultural lyrics (-0.26), or identified insects and their roles in society (-0.20).
- There was a correlation between teachers who had master degrees and the use of the following activities: planted and germinated seeds (0.16), invited in a guest speaker about agribusiness or farming (0.22), identified types of trees in a forest (0.15), identified the life cycles of plants and animals (0.15), or listed other activities (0.21).
- There was an inverse correlation between teachers who had no agricultural experience and the use of the following activities: invited in a guest speaker about agribusiness or farming (-0.17), discussed farm safety (-0.19), observed and discussed agricultural machinery (-0.15), transplanted plants or planted a tree (-0.16), discussed the seasons and agricultural activities (-0.18), discussed soil conservation (-0.16), or listed other activities (-0.44).
- There was an inverse correlation between teachers who had no agricultural classes and the use of the following activities: planted and germinated seeds (-0.19),

invited in a guest speaker about agribusiness or farming (-0.19), counted the seeds of a plant (-0.15), discussed an agricultural issue about the environment (-0.17), investigated or researched an agricultural issue (-0.21), discussed agricultural exported products (-0.17), transplanted plants or planted a tree (-0.17), identified types of trees in a forest (-0.22), viewed birds or wildlife (-0.16), incubated eggs and hatched chicks (-0.15), discussed water quality (-0.21), or listed other activities (-0.36).

- There was a correlation between teachers who taught in more urban communities and the use of the following activities: identified types of trees in a forest (0.17), recycled paper and discussed renewable resources (0.18), or identified the life cycles of plants and animals (0.15).
- There was an inverse correlation between teachers who taught in more urban communities and the use of the following activities: colored agricultural pictures (-0.37), discussed farm safety (-0.36), observed and discussed agricultural machinery (-0.15), or listed other activities (-0.18).
- There was a correlation between teachers who taught in larger school districts and the use of the following activities: dissected a flower (0.16), identified types of trees in a forest (0.15), identified foods eaten in other cultures (0.17), recycled paper and discussed renewable resources (0.18), identified insects and their roles in society (0.20), or identified the life cycles of plants and animals (0.24).
- There was a correlation between teachers who taught in larger school districts and the use of the following activities: discussed farm safety (-0.34), observed and

discussed agricultural machinery (-0.15), or conducted an agricultural theme poster contest (-0.20).

- There was an inverse correlation between teachers who taught in school districts with no agriculture teacher and the use of the following activities: colored agricultural pictures (-0.16), discussed farm safety (-0.23), or listed other activities (-0.37).
- There was an inverse correlation between teachers who were female and the use of the following activities: calculated the area of a field (-0.21), calculated the volume of a storage structure (-0.16), or composted plant material (-0.26).

Comments Made By Elementary Teachers Regarding Teaching Agriculture

Elementary teachers were given an open ended question to respond to in Part C of the instrument, "What are your thoughts and ideas regarding the integration of teaching agriculture in the elementary curriculum?" Sixty-three percent (n = 179) of the teachers surveyed responded with written comments to the question. Over one hundred teachers (56.7%) supported integrating agriculture or are currently integrating agriculture into the curriculum (Table 16). Table 17 summarizes the comments made by teachers. Appendix E lists every comment that was written on the survey in response to the open ended question.

Table 16. Summary of comments relating to support and/or concern of integration (n = 179)

COMMENTS:	n
Supported integration or are currently integrating agriculture in the classroom.	101
Supported integration or are currently doing it but also said that there is no time or room in the curriculum for any more topics/subjects.	35
Stated that there is no time or room in the curriculum.	10

Table 17. Summary of comments relating to areas of interests (n = 179)

COMMENTS:	n
Science-related; environmental science.	35
Resources are needed. Resource cards idea. Updated materials needed. Ag. curriculum materials needed.	31
Social Studies-related.	15
Farm-focused; farm unit taught; farmer guest speakers.	11
All subjects-related.	9
History-related.	9
Thematic instruction would be good; do not teach as a separate subject.	9
K - 3 related.	8
Language-related; literature-related; reading-related.	6
Agriculture education is limited because there are so few students interested.	6
Agriculture needs to be accurately represented in textbooks. An ag. textbook needed. Quality literature needed.	6
Animal-related.	5
There are so few kids from the farm.	5
Inservices are needed. Offer credit.	5
Geography-related.	5
Math-related.	5

Table 17. (continued)

COMMENTS:	n
There is no time to teach agriculture.	4
Health-related; nutrition-related.	4
ISU Academy was helpful; Food, Land, & People was helpful.	4
Alternative agriculture needs to be taught such as organic growth rather than conventional agriculture; Does not use industry produced materials.	4
FFA/Ag. Ed. Programs are conducted.	4
Commodity groups mentioned; Farm Bureau mentioned .	4
Garden-related.	3
Agriculture would be best taught in Junior & Senior High grades.	2
Concerns about misconceptions.	2
Business-related.	2
Farm safety-related.	2
Physical Education-related.	2
4-H programs are conducted.	1
Special Education-related.	1
Not appropriate for Kindergarten.	1
Not appropriate for P.E..	1
Not appropriate for Art or Language Arts.	1
The term agriculture is not in the vocabulary list.	1
Students already know about agriculture.	1
Teach as a separate subject.	1
Administrative support needed.	1
Agriculture is not needed in the elementary curriculum.	1
Art-related.	1
Many of are students have farm background.	1
Field trips are very important	1

CHAPTER V. DISCUSSION

The purpose of this study was to analyze the status of agricultural awareness efforts in elementary (K through 6) grades in a selected area of Iowa and create a model of agricultural awareness for the community education system. There were four primary objectives of this study:

(1) Identify elementary school teachers' perceptions regarding issues related to agriculture.

(2) Identify the extent to which agricultural awareness activities are conducted in elementary school classrooms.

(3) Compare selected demographic data with perceptions and activities of elementary school teachers in east central Iowa.

(4) Develop a model for delivery of agricultural awareness programming.

There were several findings in the study that supported the existing literature. Moreover, a few findings did not support some of the literature that was reviewed. The researcher will relate the findings of the study with the literature in this discussion in the following sections: (1) perceptions of agriculture; (2) basic knowledge of agriculture; (3) integration of agriculture in the elementary curriculum; (4) the key component of successful integration; (5) agriculture taught in other subjects; (6) agriculture includes other career areas; (7) activities conducted in urban communities; (8) agricultural resources and in-services; (9) the impact of agricultural education professionals; (10) agricultural classes and experiences; and, (11) guest speakers and field trips. Further, a new paradigm for integrating agricultural awareness in the elementary curriculum is presented.

Perceptions of Agriculture

Coon and Cantrell (1985) expressed concerns about the American public's image of agriculture being traditional, outdated, and ignorant. Although some of these attitudes do exist among some people, the elementary teachers surveyed did not hold this perception of agriculture. Eighty-seven percent (n = 244) of the elementary teachers surveyed disagreed or strongly disagreed that agriculture is too outdated to be taught in elementary classes. Further, forty-six percent (n = 129) strongly disagreed and forty-seven percent (n = 132) disagreed that there is no future in agriculture. Thus, we may assume that over ninety-three percent (n = 261) of the elementary teacher see a future in agriculture. However, when asked specifically if agriculture has a positive future for people and business, seventy-three percent (n = 205) of the teachers agreed or strongly agreed. Furthermore, seventy-five percent (n = 210) of the teachers agreed or strongly agreed that agriculture has a lot of career opportunities; and, seventy-seven percent (n = 216) of the teachers surveyed agreed or strongly agreed that agriculture has a skilled, educated workforce. Fifty-three percent (n = 149) of the teachers surveyed agreed or strongly agreed that agriculture is America's largest employer; this shows that nearly half of those surveyed do not know that agriculture is the largest industry. However, the teachers do see agriculture as being very technical and computerized; eighty-six percent (n = 242) of the elementary teachers agreed or strongly agreed that agriculture is a highly technological industry. Ninety-four percent (n = 264) of the teachers agreed or strongly agreed that agriculture is a science-based industry and eighty-nine percent (n = 250) of those surveyed agreed or strongly agreed that agriculture is a competitive business-operated industry.

Basic Knowledge of Agriculture

The Committee on Agricultural Education established by the National Research Council (1988) envisioned that every American citizen should have the basic knowledge to understand the food and fiber system. In addition, Russell, McCracken, and Miller (1990) stated that all citizens need to develop a basic knowledge and understanding of agriculture so that they can make logical decisions regarding policies and issues that will affect agriculture. In support of this statement, fifty-eight percent (n = 163) of the elementary teachers surveyed agreed or strongly agreed that basic knowledge of agriculture is important to make daily decisions; whereas, thirty-one percent (n = 87) were neutral. In contrast, Mayer and Mayer (1974) commented that the failure of secondary schools and liberal arts colleges is that they do not teach basic courses on agriculture which means that a vast majority of the educated citizens will be ignorant of basic agricultural knowledge. In addition, fifty-nine percent (n = 166) of the teachers agreed or strongly agreed that agriculture fits the needs of the elementary students. Further, the teachers in the study supported Davenport's (1914) suggestion that agriculture should be taught in the grade school. Sixty-one percent (n = 171) of the teachers agreed or strongly agreed that every elementary student should be taught agriculture no matter what career they wanted to pursue.

Integration of Agriculture in the Elementary Curriculum

Swan and Donaldson (1970) expressed concern about the apathetic attitude and lack of concern for the nation's food and fiber. Further, Swan and Donaldson felt that teachers have ignored the study of agriculture in their classrooms. However, the study

revealed that teachers do care about agriculture since over ninety-seven percent (n = 273) feel that agriculture would enhance the elementary curriculum. Moreover, over half (n = 146) of the two hundred eighty-one teachers in the study conducted a majority of the thirty-eight listed activities at least once during the past year in their classes (Appendix B). This indicates a change in attitude that elementary teachers are more interested in conducting agricultural activities than their counterparts were twenty-five years ago or that the teachers in the geographic sampling area care more about agriculture.

There was a large support for agriculture being integrated into the elementary curriculum which supported Texler's (1994) belief that educators must develop cross-disciplinary approaches to integrating agriculture in the elementary curriculum. Specifically, one hundred one teachers (36%) wrote comments on their surveys that supported integration or they are currently integrating agriculture in their classes. An additional thirty-five teachers (12%) supported integrating agriculture into the curriculum, but they also said that there is no time or room in the curriculum for any more subjects. Although there was a very large support among the elementary teachers for integrating agriculture, there was an indication in the correlation study that teachers who taught in larger school districts or more urban communities, or did not have agriculture teachers in their school districts were less likely to agree that agriculture would enhance the curriculum.

The Key Component of Successful Implementation

Time is an important factor to involve elementary teachers to learn and develop agricultural activities as well as integrating agricultural awareness into elementary classes.

Texler (1994) mentioned that the downfall to many agricultural literacy initiatives has been the lack of time provided to build support and involvement of the elementary teachers. The elementary teachers in the study varied in their responses to the statement: "Elementary teachers are too busy to teach agriculture." Forty-two percent (n = 118) of the teachers strongly disagreed or disagreed with this statement. Thirty-one percent (n = 87) of the teachers were neutral, and twenty-five percent (n = 70) of the teachers agreed or strongly agreed that they are too busy to teach agriculture. Further, elementary teachers were varied in their responses to the statement that "there is no time to teach agriculture in the elementary curriculum." Sixty-nine percent (n = 194) of the teachers strongly disagreed or disagreed with the statement. Twenty-five percent (n = 70) of the teachers were neutral, and fifteen percent (n = 42) of the teachers agreed or strongly agreed that there is no time to teach agriculture in the elementary curriculum. Moreover, teachers who wrote comments about integrating agriculture into their classes mentioned their concern about the lack of time. Thirty-five teachers (12%) supported integration but were also stated that there is no time in the curriculum, and ten teachers (4%) mentioned that there is no time in the curriculum. These findings present challenges to make agricultural awareness initiatives sensitive to the time factor of teachers and classes; thus, any in-service programs and activities will need to be done efficiently and conveniently.

Agriculture Taught in Other Subjects

Eighty-four percent (n = 236) of the elementary teachers felt that agriculture could be taught in any subject matter and more specifically, the following percentages are those who agreed or strongly agreed that agriculture could be integrated in the listed subject

matter: science = ninety-nine percent (n = 278); social sciences = ninety-seven percent (n = 273); math = ninety-two percent (n = 259); art = eighty-nine percent (n = 250); and language arts = eighty-seven percent (n = 244). Elementary teachers support the National Research Council (1998) and Mayer and Mayer (1974) that agriculture should be taught in courses relating to history, current economic, social, and environmental significance.

Agriculture Includes Other Career Areas

Elementary teachers in the study agreed that agriculture includes other areas beyond production agriculture. The teachers concurred with the expanded definition of agriculture that was defined by the Vocational Education Acts of 1963 and 1968 (Newcomb et al., 1986):

- Ninety-one percent (n = 256) agreed or strongly agreed that agriculture includes horticulture and floriculture;
- Ninety-two percent (n = 259) agreed or strongly agreed that agriculture includes wildlife and natural resources;
- Ninety-three percent (n = 261) agreed or strongly agreed that agriculture includes forestry and woodlands; and
- Ninety-four percent (n = 264) strongly agreed that agriculture includes processing food and fiber.

Activities Conducted in Urban Communities

DeChristopher (1993) reported people have not been exposed to food production and its related technology since there is a distancing from farm life as people move towards

urban population centers. In contrast, the findings show that larger schools in more urban communities are teaching urban related agricultural topics such as forestry and horticulture and less on production agriculture such as farm safety and machinery.

The Role of School Administrators

Texler (1994) cited that successful implementation of agricultural awareness into the elementary curriculum requires tremendous effort, input, and cooperation from teachers, administrators, and the community. The study found that over 75 percent ($n = 211$) elementary teachers in the survey were neutral that "administrators support agriculture being taught in the elementary classes." This findings implies that elementary teachers do not know if school administrators support integrating agricultural awareness into the elementary curriculum.

Agricultural Resources and In-service Programs

Six elementary teachers (2%) commented on the blatant errors about agriculture in some of the books and materials that they use and felt that an accurate agricultural textbook was needed. A couple teachers shared their concerns about the misconceptions about agriculture among their students. One teacher commented that "the materials we have are outdated or non-existent" while another commented that "existing curricula includes themes very close to agriculture but as an experienced farmer and teacher, I have found blatant inaccuracies in textbooks which turn off Iowans." This supports the documentation of McReynolds (1985) that some educational materials and resources are not necessarily accurate about agriculture. Furthermore, a teacher commented that "the best agricultural teaching materials come from each of the various commodity/interest groups." However,

the elementary teachers differed on their preferences of who supplies the agricultural resources since four teachers commented that they had found current resources helpful, whereas, four teachers commented that they did not believe in current agricultural production practices and in some cases they will not use industry-produced resources.

According to Doerfert (1995), effort toward teaching agriculture at elementary levels vary from school district to school district in scope, content, activities, target audience, duration, and effectiveness. Doerfert further stated that many of these efforts have focused on getting agriculture information to non-agriculture persons. However, the researcher found that elementary teachers felt that more agricultural resources were needed and that the teachers need to be taught to use them. Sixty-seven percent (n = 188) of the elementary teachers surveyed agreed (A) or strongly agreed (SA) that elementary school teachers are not trained to teach agriculture. Further, thirty-one teachers (11%) made comments in Part C of the survey about the need for resources and five teacher commented on the need for in-service programs. The elementary teachers agree with Texler's (1994) belief that teachers need to learn how to use new resources and activities for successful implementation of agricultural awareness. In addition, this supports the findings of the National Research Council (1988) that there have not been coordinated efforts for integrating agriculture into elementary curricula. Further, although many teachers conducted agricultural activities in their classes, several teachers mentioned that they developed the activities on their own or that they would like to have more resource materials and in-service programs. These findings support Texler's (1994) findings that teachers are more likely to use curriculum materials if they were involved in developing

them. Overall, these findings regarding teachers needing resources and in-services support the need that the National Research Council (1988) recommended that systematic instruction about agriculture should be taught from kindergarten to twelfth grade.

The Impact of Agricultural Education Professionals

Over the past sixty-five years, numerous agricultural education professionals including Fox (1932), Shively (1936), Herr (1968), Wolfson (1970), Peterson and Barduson (1973), Keenan (1970), Shepard (1970), and Swan and Donaldson (1970) have wrote about programs of educating elementary students about agriculture. The discussions of elementary agricultural programs and the presence of the agriculture teacher in a school district has made a difference. The teachers in the sample who teach in school districts with no agriculture teacher were inversely correlated, thus less likely, to color agricultural pictures, discuss farm safety, or list other activities. Bennett, Keyser, and Yoder's (1993) belief that agricultural educators play an important role in educating the general public was supported by this finding in the study.

Agricultural Classes and Experiences

Several elementary teachers (n = 4) commented that they are integrating agriculture into their classes because they have agricultural experience or have taken agricultural related classes. There was an indication in the correlation analysis that teachers who had agricultural experience or completed agricultural related classes were more likely to invite in a guest speaker about agribusiness or farming, discuss agricultural issues and topics, and conducting other activities not listed in the survey. These findings support the thought that teachers who are educated about agriculture will teach agriculture to their students.

Further, teachers who have agricultural experience or classes are fulfilling the goal of the Iowa State University Teachers Academy to improve the relationship between farmers and consumers with an emphasis on elementary students.

Land grant university agricultural education departments have conducted summer classes for elementary teachers to learn more about agriculture. These types of in-service programs have also made a difference since teachers who took classes such as Project Wet and Wild; Iowa State University Teachers' Academy on Agricultural Awareness; Food, Land, and People; Vocational Agriculture/FFA; Environmental Science; and Environmental Conferences, were more likely to conduct agricultural activities in their classes such as planting and germinating seeds, inviting in a guest speaker about agribusiness or farming, counting the seeds of a plant, discussing an agricultural issue about the environment, investigating or researching an agricultural issue, discussing agricultural exported products, transplanting plants or planting a tree, identifying type of trees in a forest, viewing birds or wildlife, incubating eggs and hatching chicks, discussing water quality, or conducting other activities.

Further, elementary teachers ($n = 228$) who had agricultural related experiences such as being raised, growing up, or living on a farm; being involved in farming or married to a spouse that farms; being related to someone who farms; had a job in agriculture; and, worked in horticulture doing gardening or landscaping, were more likely to invite in a guest speaker about agribusiness or farming; discuss farm safety; observe and discuss agricultural machinery; transplant plants or plant a tree; discuss the seasons and

agricultural activities; discuss soil conservation; or conduct other activities. These findings confirm that teachers teach subjects that they are most knowledgeable and familiar.

Guest Speakers and Field Trips

Skolnik (1995) stated that teachers need to help students build a bridge to the world outside the classroom. This can be done using guest speakers or by conducting field trips. However, the researcher found that guest speakers and field trips were activities less frequently done to integrate agriculture into the elementary curriculum. Thirty-six percent ($n = 101$) of the teachers in the study conducted a field trip of a farm and thirty-eight percent ($n = 107$) invited a guest speaker about agribusiness or farming to speak to their classes.

A New Paradigm for Agricultural Awareness

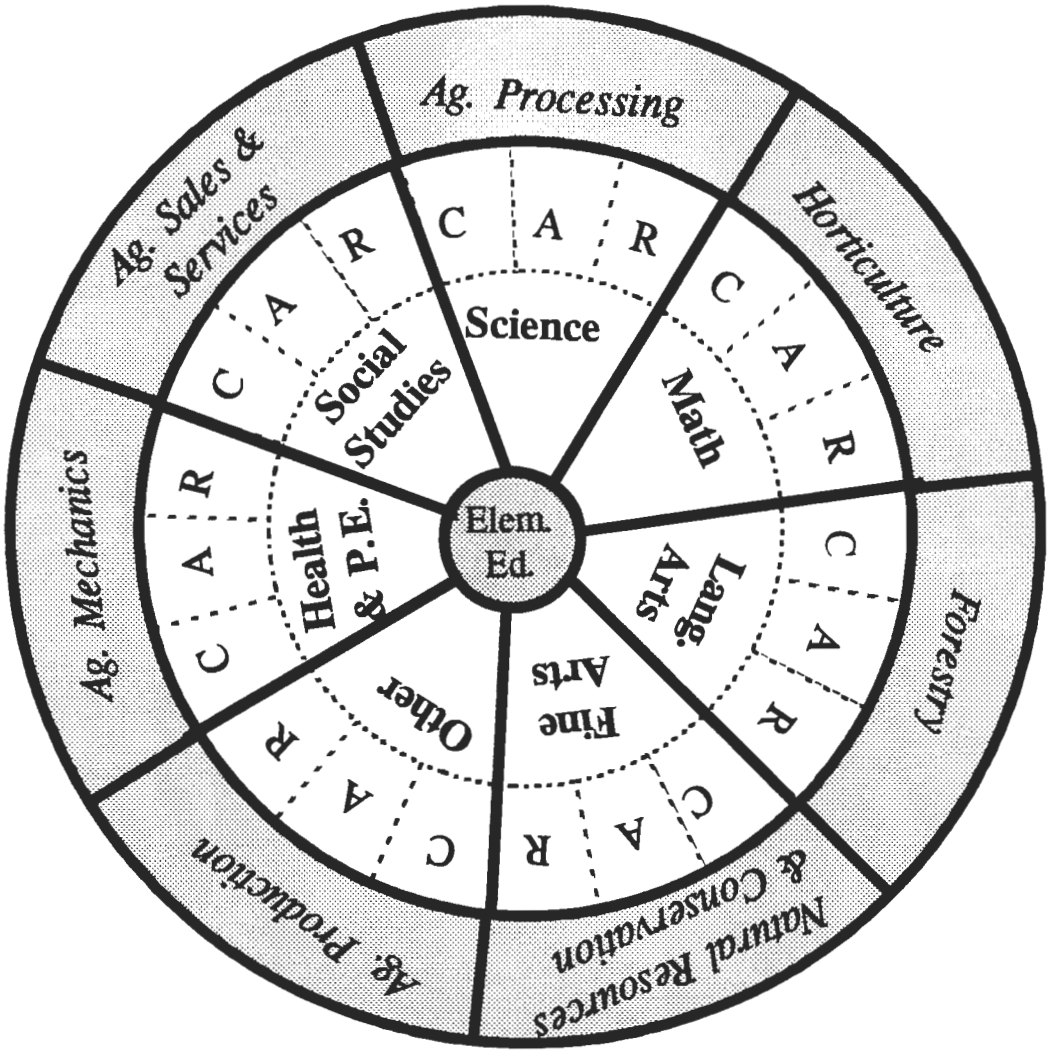
The fourth objective of this research study was to develop a model for delivery of agricultural awareness programming. This model was developed based on the findings of this study: (1) The teachers were unclear about the connections between all career areas of agriculture; (2) The teachers wanted agriculture to be integrated into what they currently teach; and (3) The teachers expressed the need for agricultural resources and in-service programs. The model is a basic framework that could provide some structure in developing educational programs in agricultural awareness. The key word to the model is integration; therefore, agriculture is blended into existing curricula. The model can be used at all grade levels in elementary as well as junior high or middle school. However, the researcher focused on integrating agricultural awareness at the elementary level based on the Systematic Curriculum Model for Agricultural Education (Iowa Curriculum Planning

Model, 1992).

According to Mark Schneider, Mid-Prairie Elementary Principal (1997), "the focus of teaching elementary students in the areas of science and social studies should be awareness and exposure." Further, this model was developed for teachers in Iowa. Iowa does not have state mandated standards in education, rather, Iowa has a strong localized control of education using school boards and advisory committees from the community.

Therefore, this model (Figure 1) was developed to help teachers create ideas, plan activities, and organize their classes to integrate agricultural activities related to the seven areas of agricultural education with the localized flexibility and variety of schools and teachers in mind. Further, the model is a spin wheel that allows the top wheel of the discipline areas and C-A-R to rotate on top of the seven areas of agriculture. The "C" stands for careers that are inter-related between the subject matter and area of agriculture, the "A" represents activities that will integrate agriculture and make the student aware of the connections between the subject matter and agriculture, and the "R" means resources which will help the teacher refer to agricultural resources available or organize any materials that will be needed to coordinate the agricultural activity.

This model was developed with considerable flexibility so that teachers can take their current class topics or units and integrate agricultural activities more efficiently. There are many opportunities to relate subject matter to agriculture since there are many diverse agricultural careers as the spin wheel model illustrates. However, the researcher recognizes that it may not be possible to integrate an agricultural awareness activity in some units in the elementary curriculum. Therefore, the flexibility of the spin wheel



C: Careers
A: Activities
R: Resources

Other:
Personal Development
Religion
Gifted
Special Education
Library/Media
Computers

Figure 1. The wheel of agriculture: a spin wheel model for integrating agricultural awareness activities

allows for the teacher to move to another area of agriculture and consider another activity to make the agricultural connection to the subject matter.

Further, some teachers will find this model very useful based on their subject matter, interest, and experience while other teachers may not be as comfortable using the model. Thus, it is recommended that in-service programs be conducted to educate elementary teachers from all discipline areas to coordinate, develop, and share their ideas, activities, successes, and struggles.

There are also other delivery methods to integrate agriculture into the curriculum that may use this model. Some teachers have used interdisciplinary teams of teachers that have integrated agriculture into a thematic study such as the Iowa Rivers Project. Further, some teachers have teamed up two or more disciplines to relate agriculture to subjects in the curriculum such as the Ag-Life Science class that is taught to all 7th graders at Mid-Prairie Junior High in Kalona, Iowa, by the science and agriculture teachers (Foster and Knobloch, 1994).

The results of this study including the "Wheel of Agriculture: A Spin Wheel Model for Integrating Agricultural Awareness Activities" could have a major impact on the delivery of elementary education at the local level in Iowa based upon recommendations developed from the study. The findings from this study indicate that teachers believe that agriculture is too important of a topic to be neglected, and they would like to enhance the elementary curriculum with easy activities and accurate resources that can be efficiently integrated into their curricula.

CHAPTER VI. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to analyze the status of agricultural awareness efforts in elementary (K through 6) grades in a selected area of Iowa and create a model of agricultural awareness for the community education system. There were four primary objectives of this study:

(1) Identify elementary school teachers' perceptions regarding issues related to agriculture.

(2) Identify the extent to which agricultural awareness activities are conducted in elementary school classrooms.

(3) Compare selected demographic data with perceptions and activities of elementary school teachers in east central Iowa.

(4) Develop a model for delivery of agricultural awareness programming.

In this chapter, the study of agricultural awareness is summarized, recommendations on agricultural awareness are presented, recommendations for further research are suggested, and the implications and significance to education are predicted.

Summary

The purpose of this study was to analyze the status of agricultural awareness efforts in elementary grades (K through 6) in a selected area of Iowa by identifying elementary school teacher's perceptions regarding issues related to agriculture, identifying the extent of which agricultural awareness activities are conducted in elementary school classrooms, and comparing selected demographic data with perceptions and activities of elementary school teachers.

A Likert-type survey instrument was sent to 689 elementary teachers in the Grant Wood Area Education Agency which is a seven county educational service area in Eastern Iowa. Forty-five percent of the teachers (n = 311) responded with 281 surveys (41%) completely filled out and were usable for the study. A descriptive study was conducted in that means, standard deviations, and frequencies were used to analyze data from a survey instrument focused on views of integrating agriculture and agricultural activities into the elementary classes. Inferential statistics were used to compare selected demographic data with perceptions and activities of elementary teachers.

Elementary teachers believe that the study of agriculture would enhance the elementary curriculum. They strongly believe that agriculture needs to be integrated within the subjects already taught and not be added as an additional subject. Many teachers have conducted agricultural activities in their classes and some did not realize that the activities were related to agriculture. Although the teachers agreed that agriculture includes career areas of horticulture, forestry, agricultural processing, and natural resources and conservation, some did not make these connections to the activities they conducted in their classes. Some teachers appeared to relate agriculture as being farming since several mentioned that they teach a unit on farming.

Moreover, the teachers viewed agriculture as an industry with a wide variety of skilled, educated careers with a positive future. They also believe that a basic knowledge of agriculture is important for every elementary student. However, they want current, accurate resources with additional training to help integrate agriculture into their classes. Teachers were also concerned about the quality of integration. They did not want another

teaching mandate added to their curriculum, but rather they wanted to integrate agriculture into their current classes with the time, education, and support needed to implement it successfully.

Conclusions

Overall, there was a very positive response about agricultural awareness among the elementary teachers participating in the study. The following statements represent conclusions derived from the data analyzed in this study:

- Nine out of ten teachers agreed that agriculture would enhance the elementary curriculum.
- Six out of ten teachers felt that basic knowledge of agriculture is important to make everyday decisions.
- Six out of ten teachers felt that every elementary student should study agriculture no matter what career they plan to pursue.
- Six out of ten teachers felt that studying agriculture fits the needs of elementary students.
- Elementary teachers strongly believed that agriculture should be integrated into the curriculum and not be added as an additional subject. Several teachers commented that it needs to be integrated as a well designed plan with quality materials and support.
- A majority of the teachers disagreed with the statement that there was no time to teach agriculture in their classes. However, the most common concern among the elementary teachers about integrating agricultural awareness was having no time in

the day or room in the curriculum. The second concern, closely following the first, was the need for current, accurate resources.

- Eight out of ten teachers believed that agriculture can be taught in any subject matter including science, social sciences, math, art, and language arts.
- Two of every three teachers felt that elementary teachers are not trained to teach agriculture in their classes.
- The teachers in the study agreed that agriculture included other career areas such as horticulture, forestry, natural resources and conservation, and agricultural processing. Several teachers did not make these other career connections in their classes since they commented that they taught agriculture in their farming units. Moreover, some teachers commented that they were unsure about the study's definition of agriculture.
- Over ninety percent of the teachers agreed that agriculture includes other career areas such as horticulture, floriculture, wildlife, natural resources, forestry, woodlands, and processing food and fiber.
- Elementary teachers believed that there is a very positive future in agriculture and see it as a highly technological, science-based, environmentally conscious, and competitive business operated industry with a lot of career opportunities and a skilled, educated workforce.
- Elementary teachers have conducted a lot of agricultural activities but believed that they need to do more agricultural activities. Teachers did not realize all the connections and relationships of agriculture to the subjects they taught.

- Elementary teachers felt time pressure with an overloaded curriculum.
- Elementary teachers wanted resources that are user-friendly, current, and accurately represented the agricultural industry.
- Elementary teachers who had taken agriculturally related classes and/or have agricultural experiences have conducted both more and comprehensive agricultural awareness activities.
- Only half of the teachers knew that agriculture employed more people than any other industry in the nation.
- Teachers who had not taken agriculturally related classes, had no agricultural experiences, or taught in more urban communities were less likely to see the relevance of agriculture for elementary students.
- Teachers who had taken agriculturally related classes were more likely to teach agricultural activities that were not listed in the survey and agreed that agriculture has other career areas besides farming.
- Teachers who taught in school districts with the presence of an agriculture teacher were more likely to agree that agriculture was highly technological and a science-based industry.
- Teachers who taught in urban communities were more likely to conduct horticulture, forestry, and natural resources activities such as identifying trees, recycling paper, discussing renewable resources, and identifying life cycles of plants and animals.
- Teachers in smaller schools, most likely in rural communities, were more likely to

conduct agricultural production oriented activities such as agricultural poster theme contests, discussed farm safety, or observed and discussed agricultural machinery.

Recommendations

The researcher has formulated a few recommendations on integrating agricultural awareness into the elementary curriculum after five years of collecting and researching literature, attending the Iowa State University Teachers' Academy on Agricultural Awareness and a workshop on Food, Land, and People; integrating agriculture into science by team teaching a seventh grade class with the science teacher; working with elementary teachers to conduct agricultural activities in their classes; and, analyzing and interpreting the data that was collected from the 281 elementary teachers in the sample.

- Organize user-friendly resources that are current and accurately represent all facets of the agricultural industry by establishing a network of resources and contact persons including local guest speakers. Since elementary teachers have very little time in their busy schedules they need to be able to access resources very conveniently and efficiently. All agricultural resources including those from commodity groups and industry associations should be accessible with one call rather than having elementary teachers calling each commodity group and association. Order forms should be sent out to elementary teachers at the beginning of the year and this would allow them to order the materials that they need. Videotapes could be loaned for two weeks for the date specified or purchased at a nominal cost. A state-wide fulfillment house should be established to coordinate this networking service.

- Establish and maintain a web-site on the Internet that would list all agricultural resources and elementary teachers could complete their order on-line. Further, put the newsletter of agricultural information and agricultural awareness activities on the web-site. Moreover, develop agricultural resources that can be accessed from the Internet by the elementary teachers in their classrooms.
- Cooperate with the Area Education Agencies on providing the agricultural resources such as video tapes through their professional catalog of educational media resources.
- Market agricultural awareness in-service programs and workshops to media specialists and encourage them to increase their agricultural knowledge base and awareness of agricultural resources. Cooperate with media specialists in providing agricultural resources to elementary teachers.
- Offer the workshops and in-service programs for continuing education credit or University graduate credit.
- Encourage Farm Bureau county organizations and local agricultural businesses and organizations to provide scholarships for teachers to attend the workshops and in-service programs on agricultural awareness. Encourage local networking among elementary teachers and agricultural personnel to enhance local educational efforts.
- Develop resources that will be more relevant to all students including those in metropolitan and urban communities. Resources should include areas of horticulture, floriculture, landscaping, pomology, olericulture, entomology, plant pathology, integrated pest management, sustainable agricultural practices, natural

resources, wildlife management, conservation practices, forestry, woodland management, fiber processing, food technology and processing, value-added agricultural products, international trading of imported and exported agricultural products, sustainable energy practices, and renewable agricultural resources.

- Coordinate in-service programs for elementary teachers to integrate activities relating to all seven agricultural career areas in all subject matter areas.
- Provide follow-up support for elementary teachers who attend the in-service programs with monthly or quarterly newsletters that may include facts and figures about agriculture, new agricultural resources and materials, and agricultural activities or ideas created and conducted by other elementary teachers.
- Focus on developing materials and programs that teachers will see more relevance in teaching and be more easily integrated. For example, teachers who teach in more urban schools will be more likely to integrate agricultural topics in horticulture, forestry, and natural resources.
- Develop agricultural related literature, books, or resources that can be used in language arts classes since over 90 percent of the elementary teachers taught language arts.
- Develop a "State of Agriculture" pamphlet that would highlight the basic facts of the current status and future changes and needs of the agricultural industry of all seven agricultural occupational areas for the state and nation that will be sent on an annual basis to all elementary teachers.
- Conduct workshops on how to analyze, integrate, and relate agricultural issues to

communities, state, national, and global levels into elementary classes.

- Elementary teacher education programs need to educate future elementary teachers about the food, fiber, and environmental science industry and how to integrate agricultural awareness activities into their classes.
- Conduct workshops on integrating agricultural awareness activities at professional conferences that elementary teachers attend; workshops should also be conducted at subject matter conferences such as the Science Teachers Convention.
- Conduct workshops or set-up displays to inform curriculum directors, counselors, and administrators on agricultural awareness at their professional and association conferences. Encourage curriculum directors, counselors, and administrators to attend the agricultural awareness workshops.
- Recognize schools, teachers, and administrators who have integrated agriculture into their elementary classes and curricula. The Governor's Council on Agricultural Education should consider developing a new award of excellence focused on integrating agriculture into the elementary curriculum.
- Market the need for agricultural awareness in the elementary curriculum to audiences including teachers, administrators, school boards, parents, community persons, and agribusinesses.
- Secure support from all sectors of the agricultural industry and coordinate a unified approach for agricultural awareness that represents businesses, organizations, commodity groups, and associations from all seven areas of agricultural education.
- Share the results of this study with the Iowa Department of Education and the Iowa

Department of Agricultural and Land Stewardship and see if there can be collaboration on integrating agriculture at the elementary levels.

- Share the results of the study with elementary textbook publishers and develop new editions of textbooks with agricultural awareness integrated in the textbook.
- Encourage more frequent integration of student activities related to agriculture. The frequency of agricultural activities was low--one or two times per year--and they should be conducted more frequently such as a current issues relating to agriculture could be discussed at least once a month. However, some activities listed in the survey will only be conducted once a year.
- Develop a comprehensive, systematic model for agricultural awareness education for ages ranging from kindergarten to adult.
- Implement and educate elementary teachers on how to use the "Wheel of Agriculture: A Spin Wheel Model for Integrating Agricultural Awareness Activities.

Recommendations for Further Research

It is suggested that further studies be conducted in this topic area:

- Conduct a study to determine the usefulness and educational effectiveness of current materials and educational programs.
- Conduct a national study similar to this study on agricultural awareness to determine the national scope of agricultural awareness.
- Conduct a study to determine how the elementary curriculum has been affected by teachers who have taken specific agricultural classes such as the Teachers'

Academy and Food, Land, and People.

- Conduct a study to determine the knowledge, attitudes, and perceptions of elementary students.
- Conduct a future study of the biases and inaccuracies of agriculture in elementary textbooks and literature.
- Conduct a comprehensive study that focuses on agricultural activities that are being conducted in elementary classes.
- Conduct pre-tests and post-tests of educational materials developed to determine the effectiveness of new resources.
- Survey or interview elementary teachers and determine what agricultural-related teaching materials and resources are needed.
- Develop careers information in all seven career areas, resource guides, curriculum materials, and agricultural activities using a panel of elementary teachers and agricultural professionals to supplement the "Wheel of Agriculture" spin wheel model.
- The researcher chose not to focus entirely on agricultural production activities; however, there are commodity groups and agricultural interest groups that may want to study this area specifically to see what agricultural production activities are being conducted in elementary classes. The researcher feels that this focus on agricultural production does not completely represent all the career opportunities in agriculture and it would be limiting for most metropolitan and urban schools to see the relevance of integrating into their curricula.

Implications and Significance to Education

The need for teaching agriculture at the elementary grades has been discussed for over 65 years. However, no recent research studies or data were found that directly imparted educational programming at the elementary level. This base line study identifies the problem and needs based upon the feedback of elementary teachers and provides a basis for future research to be conducted. The results of this research study provides documentation of the teachers' views of the significance of educating elementary students about agriculture.

The new spin wheel model on integrating agricultural awareness activities into the elementary curriculum could provide elementary teachers with a easy tool to help them plan activities that will integrate agriculture into their lessons. Elementary students could be more enthused about learning and learn more because they will be applying the concept in agricultural contexts. More, children could start exploring careers at an earlier age and be more focused in their education towards their career goals.

Further, this study provides direction for new programming in agricultural and elementary education. It provides research-based information that will help the state and perhaps national initiatives in formulating a strategic plan for agricultural education. Land grant university agricultural education departments and teacher education programs will be able to develop their teacher academy and institutes upon this research. Commodity organizations, business associations, and educational agencies will be able to develop educational resources based upon results of this study.

APPENDIX A

HUMAN SUBJECT REVIEW COMMITTEE APPROVAL FORM

Last Name of Principal Investigator Knobloch

Checklist for Attachments and Time Schedule

The following are attached (please check):

12. [X] Letter or written statement to subjects indicating clearly:
    a) purpose of the research
    b) the use of any identifier codes (names, #'s), how they will be used, and when they will be removed (see Item 17)
    c) an estimate of time needed for participation in the research and the place
    d) if applicable, location of the research activity
    e) how you will ensure confidentiality
    f) in a longitudinal study, note when and how you will contact subjects later
    g) participation is voluntary; nonparticipation will not affect evaluations of the subject

13. [ ] Consent form (if applicable)

14. [ ] Letter of approval for research from cooperating organizations or institutions (if applicable)

15. [X] Data-gathering instruments

16. Anticipated dates for contact with subjects:

First Contact	Last Contact
April 15, 1996	June 15, 1996
Month / Day / Year	Month / Day / Year

17. If applicable: anticipated date that identifiers will be removed from completed survey instruments and/or audio or visual tapes will be erased:

August 15, 1996
Month / Day / Year

18. Signature of Departmental Executive Officer | Date | Department or Administrative Unit

✓ [signature] | 4-3-96 | Ag Ed

19. Decision of the University Human Subjects Review Committee:

X Project Approved ___ Project Not Approved ___ No Action Required

Patricia M. Keith | 4-16-96 | P M Keith
Name of Committee Chairperson | Date | Signature of Committee Chairperson

APPENDIX B

SURVEY COVER LETTER AND INSTRUMENT

May 7, 1996

Dear Elementary Teacher:

Recently, there has been discussion about teaching agricultural topics in the elementary classrooms of our schools. The issue of fewer families living on farms has led to more children, students, and citizens knowing less about the largest industry and employer in the nation and state--agriculture. There have been scattered efforts of trying to get agricultural resources, activities, and training to elementary teachers; however, there has been no baseline study to see what elementary teachers think or do in their classrooms regarding agriculture.

Your views and attitudes towards agriculture being integrated into elementary classrooms are very important to gain a complete view of the situation. The results of this study will be provided to administrators, teachers, and business leaders interested in agricultural education to make better informed decisions on this important topic. The study is also being conducted for a Master's thesis.

The information you provide will be strictly confidential and the reporting of the results will be limited to group summary information. All questionnaires will be destroyed once the data is summarized. The questionnaire will take approximately 10 minutes to complete. Participation in this study is completely voluntary. Your nonparticipation will not affect evaluation of the subject. However, if you choose not to participate, please notify us by returning the blank questionnaire so you will not be contacted again.

For your convenience, a pre-addressed, stamped envelope has been included for the return of your completed questionnaire. Please return the questionnaire by May 20, 1996. Thank you for taking the time to complete this questionnaire and helping express the opinions of elementary teachers regarding this important topic.

Sincerely,

Neil Knobloch
Graduate Student
Department of Agricultural
Education and Studies

Robert A. Martin
Professor
Department of Agricultural
Education and Studies

AGRICULTURAL AWARENESS SURVEY

Part A: Views on Integrating Agriculture into Elementary Classes

INSTRUCTIONS: Please read the following statements and indicate how much you agree or disagree with each statement. Use the following categories in determining you response. Please circle the appropriate letter or letter group.

SD	=	Strongly Disagree
D	=	Disagree
N	=	Neutral
A	=	Agree
SA	=	Strongly Agree

Agriculture would enhance the curriculum.	SD	D	N	A	SA
Elementary teachers are too busy to teach agriculture.	SD	D	N	A	SA
The study of agriculture is a waste of time in elementary education.	SD	D	N	A	SA
Basic knowledge of agriculture is important to make daily decisions.	SD	D	N	A	SA
Agriculture could be integrated in science.	SD	D	N	A	SA
Agriculture could be integrated in language arts.	SD	D	N	A	SA
Agriculture could be integrated in social sciences.	SD	D	N	A	SA
Agriculture could be integrated in math.	SD	D	N	A	SA
Agriculture could be integrated in art.	SD	D	N	A	SA
There is no time to teach agriculture in the elementary curricula.	SD	D	N	A	SA
Agriculture is too outdated to be taught in elementary classes.	SD	D	N	A	SA
Agriculture can be taught in any subject matter.	SD	D	N	A	SA
Administrators support agriculture being taught in the elementary classes.	SD	D	N	A	SA

Elementary school teachers are not trained to teach agriculture.	SD	D	N	A	SA
Agriculture fits the needs of the elementary students.	SD	D	N	A	SA
Agriculture includes horticulture and floriculture.	SD	D	N	A	SA
Agriculture includes wildlife and natural resources.	SD	D	N	A	SA
Agriculture includes forestry and woodlands.	SD	D	N	A	SA
Agriculture includes processing food and fiber.	SD	D	N	A	SA
There is no future in agriculture.	SD	D	N	A	SA
Agriculture is America's largest employer.	SD	D	N	A	SA
Agriculture is a highly technological industry.	SD	D	N	A	SA
Agriculture is a science-based industry.	SD	D	N	A	SA
Agriculture is a competitive business-operated industry.	SD	D	N	A	SA
Agriculture is an environmentally-conscious industry.	SD	D	N	A	SA
Agriculture has a skilled, educated workforce.	SD	D	N	A	SA
Agriculture has a lot of career opportunities.	SD	D	N	A	SA
Agriculture has a positive future for people and businesses.	SD	D	N	A	SA
Every elementary student should be taught agriculture no matter what career they want to pursue.	SD	D	N	A	SA
Every Junior High/Middle School student should be taught agriculture no matter what career they want to pursue.	SD	D	N	A	SA
Every High School Student should be taught agriculture no matter what career they want to pursue.	SD	D	N	A	SA

Part B: Agricultural Activities in the Classroom

INSTRUCTIONS: Each of the following items represents agricultural activities conducted in your classroom. Indicate the frequency to which you have done these activities in your classroom. Use the following categories in determining your response. Please circle the appropriate letter or letter group.

0	=	never
1	=	once a year
2	=	twice a year/once a semester
3	=	Three or more times per year

Planted and germinated seeds.	0	1	2	3
Conducted a field trip of a farm.	0	1	2	3
Invited in a guest speaker about agribusiness or farming.	0	1	2	3
Colored agricultural pictures.	0	1	2	3
Counted the seeds of a plant.	0	1	2	3
Calculated the area of a field.	0	1	2	3
Calculated the volume of a storage structure.	0	1	2	3
Discussed an agricultural issue about the environment.	0	1	2	3
Investigated or researched an agricultural issue.	0	1	2	3
Discussed farm safety.	0	1	2	3
Identified the ingredients from a food label.	0	1	2	3
Discussed agricultural exported products.	0	1	2	3
Made a craft using agricultural products.	0	1	2	3
Observed farm animals.	0	1	2	3
Observed and discussed agricultural machinery.	0	1	2	3
Transplanted plants or planted a tree.	0	1	2	3

Dissected a flower.	0	1	2	3
Identified types of trees in a forest.	0	1	2	3
Viewed birds or wildlife.	0	1	2	3
Discussed the prices of food.	0	1	2	3
Incubated eggs and hatched chicks.	0	1	2	3
Toured a local agribusiness.	0	1	2	3
Made a craft from farm products.	0	1	2	3
Discussed natural fabric fibers from plants or animals.	0	1	2	3
Identified by-products from animals and crops.	0	1	2	3
Prepared or processed food products.	0	1	2	3
Made ice cream.	0	1	2	3
Made paper.	0	1	2	3
Conducted an agricultural theme poster contest.	0	1	2	3
Discussed the affect of weather on crops or livestock.	0	1	2	3
Discussed the seasons and agricultural activities.	0	1	2	3
Composted plant material.	0	1	2	3
Discussed soil conservation.	0	1	2	3
Discussed water quality.	0	1	2	3
Raised earthworms.	0	1	2	3
Discussed the role of food in holidays	0	1	2	3
Identified a healthy diet using the food pyramid	0	1	2	3
Identified foods eaten in other cultures.	0	1	2	3

Sang a song with agricultural lyrics.	0	1	2	3
Used an agricultural theme in a music program.	0	1	2	3
Acted out agricultural roles or situations.	0	1	2	3
Made a terrarium or enclosed ecosystem.	0	1	2	3
Recycled paper.	0	1	2	3
Identified insects.	0	1	2	3
Other _____	0	1	2	3
Other _____	0	1	2	3
Other _____	0	1	2	3

Part C: Other Comments Regarding Your Thoughts on Teaching Agriculture

INSTRUCTIONS: Please feel free to respond to the following question about your thoughts or ideas about teaching agriculture in the elementary classes.

What are your thoughts and ideas regarding the integration of teaching agriculture in the elementary curriculum?

_____

_____

_____

_____

_____

_____

_____

_____

_____

Part D: Demographic Information

INSTRUCTIONS: Please read each of the following questions carefully before responding. Circle the response that best describes you or write the appropriate information on the line provided for each question.

1. What grade level do you teach? K-2 3-4 5-6 Other _____

2. What subject matter(s) do you teach? (Circle all that apply)

Language Arts	Social Studies	Geography	Math	Science
Health	Art	Music	Other _____	

3. How many years of teaching experience do you have?

0-7 8-14 15-21 22 or more

4. What is the highest degree you have received? B.A./B.S. M.A./M.S. Ed.D./Ph.D.

5. What is your gender? Male Female

6. What type of community do you believe you teach in?
rural
metropolitan
urban

7. What agricultural classes, workshops, or in-services have you taken? _____
_____

8. Do you have agricultural experience? Yes No

If YES, what is your experience? _____

9. Do you have an High School Agriculture Teacher in your school district? Yes No

10. How many students are in your school district (grades K - 12)? _____

Please return this survey by May 17th to: Neil Knobloch
1431 Angle Rd. S.W.
Kalona, IA 52247

Thank you for your time!

APPENDIX C

FOLLOW-UP POSTCARD

MAKE A DIFFERENCE!

A reminder to return your AG AWARENESS survey if you have not already done so. Your input is valuable to help educational and agricultural leaders plan for the future.

Thank you for making a difference by participating in this study. (If you have misplaced your survey, call and leave your name/address on the message machine at (319) 656-3005.)

APPENDIX D

SCHOOLS IN THE GRANT WOOD AEA 10
1995-96

Table 18: Public school districts in the Grant Wood AEA 10 for 1995-96

School District	Rank	Structure	SK-6	RK-6	PK-12	K-6 Tchrs
Alburnett	198	K-6-6	14	320.0	666.4	15.6
Anamosa	087	K-4-4-4	76	645.8	1370.0	33.0
Belle Plaine	164	K-6-2-4	13	413.0	787.0	22.0
Benton	063	K-5-3-4	86	814.0	1658.1	44.0
Cedar Rapids	002	K-5-3-4	415	7982.0	17761.0	357.8
Center Point-Urbana	126	K-4-4-4	0	513.4	954.8	27.5
Central City	254	K-5-3-4	22	234.0	534.0	17.0
Clear Creek-Amana	105	K-5-3-4	11	637.0	1129.0	31.3
College	029	K-5-3-4	93	1571.0	2983.0	71.4
Deep River-Millersburg	365	K-6	0	129.0	224.0	7.0
English Valleys	270	K-6-6	0	247.0	491.0	20.0
Highland	232	K-6-2-4	3	320.6	594.6	17.6
HLV	266	K-6-2-4	4	236.2	499.2	11.5
Iowa City	007	K-6-2-4	120	5592.5	10334.0	233.5
Iowa Valley	179	K-6-6	13	349.0	721.0	16.0
Linn-Mar	021	K-6-2-4	129	1813.0	4097.1	142.0
Lisbon	243	K-5-3-4	13	294.0	563.0	10.0
Lone Tree	299	K-6-6	26	200.2	417.2	14.5
Marion	056	K-3-4-5	78	885.7	1725.7	35.0
Mid-Prairie	096	K-6-3-3	49	653.6	1255.6	36.5
Midland	144	K-3-2-3-4	60	350.0	865.0	24.6
Monticello	101	K-6-2-4	31	528.6	1164.6	24.6
Mount Vernon	112	K-5-3-4	0	582.3	1050.3	29.5
North Cedar	121	K-5-3-4	31	424.0	982.5	27.0
North Linn	184	K-5-3-4	6	312.2	708.8	16.3

Table 18. (continued)

School District	Rank	Structure	SK-6	RK-6	PK-12	K-6 Tchrs
Olin	329	K-5-7	12	129.2	344.2	6.7
Solon	127	K-6-6	0	503.0	953.0	23.0
Springville	276	K-5-3-4	12	179.3	481.3	10.4
Tipton	129	K-4-4-4	17	453.0	942.0	23.5
Vinton-Shellsburg	048	K-5-3-4	90	919.0	1937.2	48.2
Washington	054	K-4-3-3-3	37	854.7	1746.7	39.0
West Branch	157	K-5-3-4	7	414.0	818.1	21.0
Williamsburg	131	K-6-6	40	441.8	927.8	31.8
TOTALS			215	3894.0	8150.3	203.6

Note: Rank - the rank according to size of enrollment of Iowa Public School Districts

Structure - the structure of grade levels

SK-6 - Special Education enrollment in grades K-6

RK-6 - Regular Education enrollment in grades K-6

PK-6 - Total enrollment of students in grades Pre-K to 6th

K-6 Tchrs - Number of teachers in grades K to 6

Table 19: Non-public schools in the Grant Wood AEA 10 for 1995-96

Non-Public Schools	Grade Structure	No. of Students
*All Saints Catholic	PK-8	275
St. Lukes Adolescent Unit		n/a
+Cedar Valley Christian (no van)		n/a
*Central Lutheran School	PK-8	130
+Cono Christian School (no van)		n/a
+Corner Stone Christian (no van)		n/a
+Faith Baptist Christian (no van)		n/a
*Good Shepherd Lutheran	K-8	6
+Grace Baptist School (no van)		n/a
Heritage Christian (no van)		n/a
Holloway House (no van)		n/a
#Iowa Braille & Sight Saving	P-12	n/a
+Iowa City Bible Fellowship (no van)		n/a
+Isaac Newton Christian Academy (no van)	P-8	n/a
*Lutheran Interparish	PK-8	201
*Mcleod Academy	PK-8	78
+Pathway Christian School (no van)		n/a
*Regina Elementary	PK-6	499
*Sacred Heart Catholic	PK-6	111
*St. James Catholic	PK-6	125
*St. John Lutheran	K-8	14
*St. Joseph Catholic	K-8	345
St. Jude Holy Family	PK-5	82
*St. Ludmila Holy Family	PK-5	82
*St. Matthew Catholic	PK-8	269
*St. Patrick Holy Family	PK, 6-8	271
*St. Patrick Catholic	K-6	81

Table 19. (continued)

Non-Public Schools	Grade Structure	No. of Students
+Seventh Day Adventist (no van)		n/a
Sharon Bethel School (no van)		n/a
+Tipton Bible Church School (no van)		n/a
*Trinity Lutheran School	PK-8	212
#University Hospital School		n/a
+Willowwind School (no van)		n/a
TOTALS		3239

[a] Not all schools necessarily participated in the survey; some are not on the van mail delivery system.

*Accredited

+Non-Accredited (Failed to offer a program of instruction in compliance with Iowa education standards or which have chosen not to seek approval by the Department of Education)

#Board of Regents (The State Board of Regents governed school programs)

NOTE: There are 379 public school districts in Iowa.

APPENDIX E

PART C: OTHER COMMENTS REGARDING TEACHERS THOUGHTS ON TEACHING AGRICULTURE

Part C: Other Comments Regarding Teachers Thoughts on Teaching Agriculture

NOTE: 179 of 281 (63.7%) Elementary Teachers responded with comments.

- I agree with it. For the most part, however, many teachers follow curricula of their texts and their texts do not include agriculture. I do think people should be more aware of agricultural interests. It's a good lifestyle, besides being a necessity to our economic future and our source of food. Many of the items asked on this sheet, I don't teach in grades 7-8, but other teachers in our school do.

- Is material being prepared for resource similar to those we have for "environment"? What about a format like the cards used in the Newspaper in Education from the Cedar Rapids Gazette? They make great "starter" ideas and "sponge" activities that lighten teach work load.

- The integration of agriculture into the elementary curriculum in different than having separate classes on agriculture. I believe it can be integrated but I also believe that our state department of education cannot be trusted to this role. We need to teach our elementary age children the basics and DOE does not understand that or is deliberately trying to undermine education.

- I am a physical education instructor. We have food names for various exercises that we do, along with food charts. As a farming community, we talk briefly on the food products we grow. We also play several games dealing with animals.

- The time element is a problem here. What we need is a good Iowa history and Agriculture text or material that covers the MAIN IDEAS of our history (staying away from facts) and Iowa agriculture. It could be done in this farm work with a text and activity book to follow.

- I feel every child should learn the importance of agriculture. Every family is touched some way by agriculture.

- I am a former FFA and 4-H student and I feel strongly about implementing agriculture in my curriculum. I do believe that many teachers are hesitant to teach agricultural topics because they haven't received information or classes on them.

- I would welcome the curriculum.

- It's a matter of priorities. If something else is added, something needs to be deleted. Integration somewhere would be nice, however.

- I am an elementary art teacher. We use some of your subjects in art works. I went to ISU and live in Cedar Rapids. I teach at Linn-Mar Bowman Woods Elementary. We have a lot of engineer parents with our elementary.

- I would not know what to teach or how to fit it in a very busy day. More and more is added to the elementary curriculum. Nothing is taken away.

- Most of our curriculum is imposed by district guidelines and most teachers do not want to ADD another topic to what already is being taught. Ag promoters could do well to write story problems for math, social problems for life skills, environmental issues for science, etc. so that teachers can integrate them in their curriculum.

- I think K-4 programs should target things of local interest (i.e. home, neighborhood, community) and this adapts well to ag study in some areas. By 5th & 6th, intro. to horticulture, botany, zoology, and environmental issues are appropriate. We do a Pioneer Country Fair (1830-1930) which deals with history of food and fiber, but not as much modern information is presented.

- There is no time to teach anything extra. What do you have in mind as "agriculture"?

- The materials we have are out-dated or non-existent. We need quality literature written about farm life.

- Agriculture in the elementary curriculum is included in a number of subjects--but not as an individual class. Lower elementary students have opportunities to visit farms, dairies, etc.. Upper elementary incorporates the agriculture facts in social studies and science. Other than that I believe would be just one more thing to include in an already filled schedule--computer technology, DARE, etc..

- It needs to be a part of the curriculum---integrated into all subjects.

- Our kindergarten curriculum gives me the opportunity to introduce a variety of agricultural topics in the classroom through a whole language philosophy. We teach much more about agriculture chain than I thought!

- Agriculture is real life based and career based and part of Iowa! It should guide a major portion of elementary science and social studies.

- Who will supply the information/materials?

- Our fourth grade curriculum is based on the regions of the U.S. For each region, we study the agricultural products that are produced there.

- Agriculture could be integrated into the curriculum in a thematic way. Teacher workshops/staff development would have to occur for successful implementation.

- Agriculture is so closely related to science: food chains, conservation, habitats, environment, life cycles, etc. and our history and region for social studies. Curriculum should be updated to educate our students as to the 'real world'.

- Agriculture could be used to teach reading, writing, math, science, etc. skills in the classroom. There are many resources such as trade books about farming, the ISU Extension Service, local farms, etc. that could provide a comprehensive learning experience.

- I feel it is valuable, especially living in the state of Iowa where there is so much agriculture. If this were to become a part of the curriculum, however, I would feel more comfortable teaching it if I had been inserviced.

- I don't have a classroom. I'm in charge of tutoring and summer school at my school.

- I am not much help because I have not had a class for several years due to administrative work; however, I do feel that agriculture should be integrated into the curriculum and it is certainly very applicable to "real-life" experiences and "hands-on" experiences which the elementary age student needs.

- Tremendously important to have understanding of this vital area--but your questionnaire makes me feel like it is to be jammed down teachers' throats. Again, why state it in this way?

- I think it's important to educate children about ag. so it is not a "lost art". It can be taught in any subject, but it's success would depend on the quality of the ag curriculum and materials.

- It is difficult to keep adding to the curriculum and have time to cover it all. But, I can see the importance and it could be integrated into our science, health, and environmental education. Presently, I try to focus on the farmer when we discuss community helpers in social studies. I feel when choices are made, we should integrate these subjects which specifically deal with Iowa, our home. I think teachers need more education themselves along with a good source of simple activities. Perhaps an agricultural course (1 hr credit) like the "Project Learning Tree" and "Wet & Wild" courses offered for environmental education. They are funded partly by REAP. Perhaps ISU could give credit for such a course. I'd take it!!

- I grew up on a farm and feel it is important. I do a farm unit with my 1st graders.

- Agriculture should be naturally integrated into content area studies--I already see this being done in many classrooms.

- It was interesting to get this survey because I had suggested agriculture for our building-wide enrichment program this year. It got beat out by a culture fair and environmental unit. I strongly feel there would be great benefit focusing in on agriculture at the elementary age.

- It seems to be needed as part of life. It does not need to be a new subject, rather can be integrated. Can do a lot through literature, photos, posters, sharing topics, discussion. I have at least four students this year from a farm so we've been fortunate to learn quite a bit when learning about parent's occupations.

- I teach Kindergarten. When I do a "Farm" unit, it is appropriate to teach about agriculture.

- As an added subject area. We should find a way to integrate w/ science and social studies. Part A-1

- I think of livestock and farming when I think of agriculture. I suppose it involves more than this, but I'm not sure. If this term refers to any plants or animals then it is very important to teach agriculture.

- Very Important. When I started teaching 30 yrs ago, agriculture (farming) was a unit in the Social Studies curriculum. Now we do nutrition. Science-Insects/Ecology.

- "Agriculture" covers such a wide field of information and is easily adapted/integrated into what is already a full schedule. As a special ed teacher, I feel I have more freedom to teach what I feel is important, without the sometime strict guidelines imposed on regular education teachers. I find the need to purchase additional novels related to this topic, though.

- Agriculture could very easily be integrated into all subject areas. The problem is the elementary curriculum is already so overloaded with extra (non-academic) areas that need to be taught to today's youth.

- We can't add 1 more thing or even figure out how to put it in. It has to be done already.

- Existing curricula include themes very close to agriculture but as an experienced farmer/teacher, I've found blatant inaccuracies in textbooks which turn off Iowans. The best ag teaching materials come from each of the various commodity/interest groups. If they united and helped with texts, too, more ag would be taught.

- It would be ideal if we could have the time to teach agriculture to the lower elementary students. However, we barely have time to teach the basics. Living in the agricultural communities of our school district, I see that many of our students already know a great deal about agriculture. This probably is not the case in the metro schools however.

- I find it very easy to integrate agricultural issues/concepts into my first grade curriculum. I teach in a smaller, rural district.

- It is possible to integrate anything somewhere in elementary school. The question is, will time allow a quality integration, or just a passing game of farmer in the dell or planting a sunflower seed? We are asked to be teachers, cheerleaders, caretakers, and social workers. The integration would have to be seamless and replace something in order to fit into a school day.

- This area of the country, it is a must.

- I agree that agriculture should be an integral part of the curriculum. I think that its impact is greatest when it is integrated throughout all subject areas. However, teachers need time, materials, and administrative support to integrate efficiently and effectively. This does not happen enough in many districts.

- As we see small farms being lost and large organizations taking over, we, as teachers, need to know and present the future in agriculture, opportunities, specialities, etc.. We need to see the positives that would make agriculture interesting to our students. Time management is also a difficult problem, where do we direct our educational focus.

- Library...not all are appropriate.

- I actually taught a week long unit on Iowa farms yesterday and today in conjunction with Iowa's 150th birthday. I had a few great grandparents/grandparents/parents come to talk about life on a farm and the students were very interested in what it was like to grow up on a farm years ago. I think teaching about agriculture is valuable, however in order to do it good, educational supplies and resources are needed for teachers because most know very little about agriculture and we wouldn't want to teach children misconceptions about agriculture.

- I feel there are many activities you can do at all levels as far as agriculture is concerned, which can be incorporated into a variety of subjects. Our current social studies curriculum series includes a unit at our level and the local FFA chapter does the Food for America program with 3rd graders. However I feel there are many teachers who need training/materials.

- I believe it's a good idea to include agriculture at any age level & it should be. However, teachers need to do more than talk about animals, plants, earth and basic ideas. Things have been going down hill for agriculture and rightfully so. Students should be taught the ENTIRE truth how pesticides, chemicals, and very inefficient machinery affect the land, animals, and people because we consume and live with this everyday. Discuss organic growth and how popular it's becoming and WHY!! Students deserve to learn the TRUTH. However, don't show grotesque picture of VEAL, and many other animals and their terrible environment until students are in Jr. high - 7th grade.

- It is easy to incorporate into all subject areas if some material/ideas are available.

- The elementary curriculum is very full. Many agriculture areas can be integrated into currently taught subject areas. It's a natural fit in Iowa--especially rural communities.

- These assume that teaching/classroom activities are static and don't change year to year. I have done almost all of them.

- I do not use industry produced teaching materials. Agricultural practices have adversely affected our water quality: soil erosion and percolation or run off of chemicals. I do not suggest farmers are "stewards" of the land anymore, even though I come from a small IA farming community.

- As a agricultural based state, I believe we should be teaching ag in our classes. We have students who know more about other parts of the world that they do their own state.

- It is very possible but not so probable. There are so many areas trying to be integrated into the required curriculum that without having materials prepared at each grade and/or curriculum area teachers would probably not do this on their own.

- Integrating is appropriate. Time to plan and implement is critical. Then time to devote out of the school day always an issue. Fine idea but to do it well is important.

- I think it would be an excellent idea to continue integrating more agriculture in the elementary classrooms in addition to some of the curriculum we are presently using in the Iowa City Community School District.

- The term "agriculture" is not defined in your letter so answering some of the statements was difficult.

- My students do get some of these activities in their science classes. I am unsure which ones. I do not teach science. I partner with another teacher who teaches the science while I teach social studies. I would be open to agriculture except for my own lack of training and teaching time.

- As we study communities in 3rd grade, regions in 4th grade, plants in 3rd grade, and earthworms in 4th; we spend time on agricultural issues, conservation issues, lifecycles of plants and animals. As long as it is integrated it is fine. To add it as another subject to be taught; forget it!

- Most of the teachers will probably say "I don't have the time" and/or "I don't have the background" if asked to integrate ag into the curriculum. However, with guidance and encouragement these teachers could be shown that ag would be very easy to integrate naturally into many teaching units in a variety of subject areas.

- Not very appropriate for kindergarten.

- I think it could rather easily be done--especially if background information/materials are provided for teachers.

- Integration is the key. It should not be taught as a separate subject or as a separate science unit. It should enhance thematic studies. For example, if a teacher uses a transdisciplinary approach and the class theme on travel and they "visit" a country or city agriculture would obviously be in it.

- Education about agriculture is important but it needs to be done with a view appreciating conflicting interests---NOT propaganda from the commodity groups.

- * Lack of curriculum is the problem * Education of staff, if they have no agricultural experience.

- ** Environment stressed--what is taught, and what is actually happening are two different things.(ie. Too many pesticides, removal of windbreaks, etc.) **More small scale and gardening instead of "farming" taught. ** Not many opportunities for field trips...No one knows any farmers anymore!!! ** Feed agriculture is stressed much more here in the Midwest. ** Agriculture should be and is being taught in the elementary classroom.

- We do this with a primary garden project that includes year round integrated activities. We plant bulbs, seeds (flower and vegetable), and cuttings. We measure, sort, count plants, seeds, vegetables, etc. We read, write, and talk about our gardens.

- I believe it is a great idea, but teachers need training and resources--Curriculum goals and objectives, etc.. At this time, there isn't anything concrete.

- I feel it needs to be integrated. Field trips are very important as is education of teachers.

- Integration is the key to including ag. in the elementary classroom.

- The operative word is integration--how agriculture is a part of a culture; how agriculture and economy are related; how geographical features influence agriculture, etc.. It's important for the learner to see how agriculture is one thread in the tapestry of people's lives.

- Page 3/4 - Based on a two year cycle (multi-age): The term agriculture is not part of our direct curriculum vocabulary. The basic school philosophy has 8 commonalities to push its curriculum. Connectedness to nature, life cycle & producing & consuming all dealing with an aspect of agriculture.

- Teaching agricultural concepts in elementary school is important and necessary. It must be an integrated approach as opposed to another "Layer placed on top". Part B: I am not a classroom teacher so many items do not apply to me. I teach in our elementary gifted program and we don't teach traditional classes such as science, social studies, etc.

- The elementary curriculum is already overcrowded. Growing up on a farm, I am sensitive to agricultural awareness, however, I feel it would be better suited for jr./sr. high.

- I think children need to have a general idea about agriculture. Things like soil conservation, where our food comes from, etc.. Agriculture is important and especially because we are Iowans, kids should at least know some basics in elementary school. However, I think outside sources can present this information better because they are experts. Elementary teachers have many demands on their preparation time and kids respond well to outside speakers.

- I think the teaching of agriculture can be integrated into the curriculum in many areas. I teach kindergarten which enables me to expose children to many areas of agriculture. Other grade levels may have a harder time fitting agriculture into their already full curriculum loads.

- I think it could be added if integrated into the classroom, but I don't feel like I have enough education to be confident in doing it on a regular basis.

- I think it's important for kids to realize that the farmer's job is important and that it creates jobs for many other people in the community. Recently one of my students was injured in a 4-wheel ATV accident. We briefly discussed safety when using ATV's, bicycles or lawn mowers; but I feel more could be done to impress upon them(kids) how dangerous some things can be on a farm or elsewhere. I'm not sure that this can be done effectively in school.

- I feel the integration of agriculture is very important to our society.

- Yes, I strongly agree the integration of teaching agriculture in the elementary curriculum is most important. Our school usually studies Agriculture in the month March. This year we studied exotic farm animals and some students brought some of these animals to school.

- 1.) A necessity 2.) Have really enjoyed incorporating it after taking the ag class at Ames this summer. Academy was wonderful. 3.) Kids are valuable resources from this area--share with others. Many know very little about agriculture though. Footnotes P1, Q13 - They have no idea about what is happening in the classroom. P2, Q1 - Some are, some are not.

- If teachers are shown how the teaching of agriculture can be integrated into what they are already teaching (i.e., workshop for credit). I think they would be open to the ideas. To have teachers add it to their curriculum, the question would probably be WHERE.

- I feel that there is a lot of teaching agriculture in our building. On any given day, I'm sure you could find agriculturally related activities going on in some classrooms in our building. There are materials offered by various organizations--Soybean Board, Egg Council, and others--but it isn't widely publicized.

- Elementary teachers are expected to teach so many topics as it is. I feel agriculture is a valid topic, especially in Iowa, but there are only so many hours in a day. Should I remove other topics so I can integrate agriculture? I don't think so.

- P1, Q2 - Unless incorporated into Social Studies, Science, Health, Math. I don't think it should be a separate topic.

- It would take some planning but I see it being worked into the curriculum.

- Most of what I teach about agriculture is during Iowa history.

- This is a rural area but I teach very few "farm" kids. Interest and knowledge are very limited. It's sad to see the farm of the past gone. Today's agriculture is nothing like the farm lifestyle I grew up with in the 50's. I'm not sure if there is a big need for ag. education. There is little interest in it...except as a hobby or if you are born into a big corporation farm. Some general knowledge is necessary and should be presented at the elementary level. This should include economics and farm business.

- I don't do a lot of the above activities, however, we are a departmentalized school and our science teachers do many of the above activities. I guess I feel you should send the survey to them.

- The questionnaire may not be applicable to a physical education teacher, which is what I am.

- I do believe agriculture is important. We have tried erosion, water pollution to the rock unit but because of all the mandates required to teach, I just do not have enough time, or materials.

- I feel it is very important. I do often feel inadequate. I would like to know of resources to call upon to supplement my objectives. For example, on other products from animals (other than food), I would like material, as well as, speakers; may try local organizations (Cattleman's Assoc., Pork Producers, etc.). Also would like resources on rankings of states on #1 Hog, Sheep, Cattle, Corn, Soybeans, etc.. Of the above listed activities to be rated, I would like to do more, but feel inadequate. With the proper supplemental material, I would love to teach more!

- I think teaching it is good--we already do quite a bit. It's just not called "Agricultural Activities".

- I feel it is a vital part of the curriculum and most kids haven't received this integration. I had the fortune of growing up on a farm, taking an active role and benefited from programs like vo-ag, FFA, and teachers who implemented into their classroom.

- I think it is important and would be easy to do.

- I specialize in teach Remedial math, so a lot of these opportunities don't present themselves, given the limited time I have. However I do spend 40 minutes in 6th grade science class as an aide. The things I've starred are things I've seen done there.

- As can be seen from my * response, I am not a whole-language/integrated learning advocate. I believe any subject matter is best learned within a structure appropriate to it. I think that agriculture would be a good subject area for elementary students if it were taught by a qualified individual in a dedicated time block.

- I am a 2nd grade teacher in rural Iowa. I am lucky if I have 1 or 2 students in the class who live on a farm. Some have grandparents who farm. I find that most kids have a very limited knowledge of farm life, farm animals, and the planting and harvesting of crops. I think agriculture can and should be integrated into the classroom. I would like to see a curriculum written for the elementary grades that can be integrated with other areas because time is always an important factor. It seems we are being asked to teach more and more--skills for living, technology, etc..

- As each year goes by I find fewer and fewer students who have ever been on a farm. Consequently, they know very little about farm, animals, plants, or agricultural cycles. I feels it's important to bring some information about farm life into the classroom whenever possible.

- Teachers need inservice training or have the Extension Service in the schools more.

- Our younger generation needs to be informed about agriculture, agri-business, conservation, recycling, mature use of resources, etc., etc. Their very lives depend on agriculture, its importance, and respect.

- I agree with many of your statements about agriculture, it is very important to all of us. In an elementary school our curriculum guidelines are set by the state and our school district, we are so swamped with required curriculum that any agriculture we include is incidental and in our discussions of topics.

- We live in a rural area, but fewer and fewer of our students live on a farm or live within a family that operates a farm. Since agriculture is very basic to our survival, children need to have exposure to agricultural products---agribusiness offers many opportunities. We must "work" harder now to expose our students than in years past.

- I believe it's important for us to promote understanding of agriculture. Unfortunately, there are time constraints which inhibit this. We are fortunate this year, because we have been encouraged to work on a multi-age project in our building which will allow me to promote exploration of agriculture with K-3rd graders. I'm really excited about it!

- I teach social studies to 4th graders and our curriculum is American history and geography. We discuss agriculture in relation to both past and present and do many projects related to agriculture.

- This should be a part of all levels. It is difficult for many teachers because so few come from farms anymore. The future of farming is not bright, however, without the farmer, where are we? I incorporate agriculture in a casual way, not as it should be! Thank you for your interest!

- Integrating agriculture into our elementary curriculum is a good idea. Students need to know more about this industry, whether they live on a farm or not. It would be fine--if we had a curriculum and materials. Please!!

- I enjoy the resources we have received from the Soil Conservation and Soybean producers. I have used them occasionally this year.

- It could be integrated and is during the teaching of other subjects. Teaching it separately would not fit in the curriculum time-wise.

- I am presently a reading specialist teacher--teaching small groups each day so my survey is not as accurate as a classroom teacher. PLEASE NOTE--The following book my students love: "My First Book of How Things are Made--Orange Juice, Crayons, Jeans, Peanut Butter, Guitar, and More"; Scholastic Book, Copyright 1995, by George Jones.

- Did the best I could -- with music we don't usually do science experiments.

- My class has been exposed to many of the topics through science which is taught by another teacher.

- I don't know very much about agricultural topics, products, technology, careers, etc.. I do believe it's important though. I am afraid children are growing up less knowledgeable about agriculture and its affect on our lives because less families are associated with farming.

- Our very existence depends on the agriculture industry! It is very difficult to teach any curriculum without touching on some aspect of agriculture. Good luck with the thesis. I was happy to help you!

- There is quite a bit already done through science and social studies.

- Many topics come up in subject areas and apply to our rural community. 4-H makes a presentation on program and activities. Students share throughout the year their projects, etc.. Pork-Producers make a presentation and their poster contest. Safety on the farm is presented also. Include this in safety units. Pork Producers Pen Pal Packets are helpful also.

- I feel that agriculture is important and there is a lot to be learned in this area.

- Integrate my teaching about agriculture into the Iowa history curriculum.

- We need to eat to stay alive. We also need to preserve and conserve on the natural resources God has given us. We cannot help but cover these topics.

- I came from a farming background but teach in the city of Cedar Rapids so I frequently talk about my childhood experiences of growing up on a farm. I don't do a lot of things mentioned in this questionaire though. I don't know why you would want to integrate agriculture into language arts or art but I can see it as science, social studies, and math.

- Having been raised on a farm and still having strong ties to agriculture, I understand the importance it plays in our lives. Living in the heartland it is important for students to know what is responsible for the development of our state and what will keep it viable. Unfortunately as a teacher, I also know that we are continually being given new issues to present and less time to present them. To have any hope of being included in a curriculum, it would have to be able to be integrated into already established areas.

- I teach 5th grade - my focus for science all year is environmental awareness and all units done relate back to ways we can all help improve our environment. We live in a rural area, but you're right in saying that not one of my students farms the land anymore. We see farms as we pass by but we're losing our understanding of what happens.

- I have only a reading classroom for a number of years now so I asked our 4th grade teacher to fill Part B out.

- Being a teacher in a rural school district, I have had a lot of experience with agriculture. Most of my students have this as a home background. We've also had many opportunities to bring this into our classroom.

- There are so many areas that teachers need to cover that it's very hard to decide one area over another. I feel elementary teachers are basically aware of how much agriculture is a vital part of our everyday lives but aren't willing or don't feel knowledgable to teach it.

- I live in a very rural area with a lot of farming families. Many of the students will have careers on the farm and I think an agricultural program would be wonderful.
- Agriculture education should be required teaching our younger students about their own environment and then branching out. Iowa is unique in its ag setting and it's sad when our younger students can't even identify a pheasant--calling it a chicken. They need to be aware of what's around them.
- I do think it's important to teach about agriculture--especially since we live in Iowa. It's changing every year and up-to-date information is needed.
- Ideas from the class, "Land, Food, & People" were very helpful.
- Page 2 - Q1 - Need materials & Cannot create new: Page 1 - Q12 - We hope!
- Good
- I believe agriculture is already infused in our curriculum. Since we do a year on the history of Colonial Time to Pioneers West, we focus on farming as a way of life in this country. We have a wonderful weather unit on the computer which analyzes the effects on crops, farms, etc.. We also have substantial units on Earth, ecosystems, soil, insects, trees, animals, recycling, etc.. P2, Q2 - Already in curriculum, doesn't need to be a separate subject.
- Kindergartners love to learn about plant and animals but the ideas seem pretty abstract if we talk about "farm to market". FFA students offer excellent resources for us. I think many elementary classes talk about ag themes and don't mention that it is ag related.
- We have done a lot with these issues: Rainforest; all aspects of ecology/Earth Day 1.) use of poisons & pesticides 2.) Water conservation; Birds. We integrate curriculum so any of the above would not be strictly science... writing (language arts) field.
- Food, Land, & People is an excellent and easy way to incorporate ag lessons into curriculum. The Iowa Department of Education should have information on the pilot project being taught across the nation. My class was one of those piloting the curriculum.
- I teach K/1 class, agriculture is brought in according to themes we study. Since I have my students for 2 yrs, I rotate themes.
- In the primary grades and within our reading themes and other areas, we touch many corners of agriculture. I do not have the time to teach it as a separate subject.

- I would like to see it happen, but definite curriculum plans/materials would need to be supplied to teachers. Our 5th grade curriculum is already too extensive to cover over one year's time. I'd be very interested in an integrated unit which also fit into a current area of study.

- If integrated into other subjects and not "added to" the curriculum might make this a good idea.

- There is already a good deal of curriculum in first grade. We deal with farm topics primarily in the fall when our reading/literature unit begins with farm stories. We also teach an animal unit in the fall science. Farm animals are included.

- With our need for environmental preservation, integration of ag ideas would be beneficial. "Teacher Viewpoint"---Adding yet another curriculum to an already over-loaded day would be discouraging.

- P3, Q4 - Not coloring book, but our own creations. P3, Q13 - Collage.

- I do not teach in a traditional classroom. I work with students in a kindergarten through 8th grade Home School Assistance Program. We have found that many of the above mentioned activities are very valuable and highly interesting and successful.

- We were taught agriculture when I grew up. Many of my students have little to no idea what it is like to live on a farm.

- Agriculture is a very natural part of our science curriculum (plants, seeds, soil, weather, etc.). We teach thematically, integrating subject areas, so agriculture comes up naturally often--just not in isolation.

- It's important for elementary students to realize where food comes from and the many used of plant and animal products.

- For a long time, I have been concerned that children (5 year olds) in a city so closely associated with Ag. knows so little about farms. There is a natural curiosity about farms exhibited by 5 year olds. Unfortunately, at present time there is little time in the curriculum day to day to much in depth! Educators are not always allowed to include what they feel is necessary. The curriculum is full already.

- What is meant by teaching agriculture? I think understanding of agriculture's impact on our lives as Iowans is a must. It's importance globally is crucial to understanding of world.

- Very important -- but no resources or emphasis is given to it. I grew up on a farm and am very aware of the value and impact of agriculture topics.

- The 3rd grade curriculum includes plant and animal life cycles, food chains, and webs. We talk about light energy, feed energy, and how we obtain both. Trees and plants providing food energy are crucial to all living organisms and agriculture insures that quality and quantity are maintained.

- I am not a classroom teacher, I am a resource teacher.

- This was difficult to complete because I do not teach elementary. I teach 8th grade American History and Family Life Education. I did, however, note that several of the items listed on pages 3 through 5 are covered in our science classes in 8th grade.

- I feel as though I am not trained in the teaching of agriculture to feel comfortable with it at the middle school level.

- Concepts are important. If you plan to develop curriculum, make sure they are user friendly and can easily and sometimes quickly be implemented and integrated.

- While there are areas of awareness that could be explored at the elementary level, I strongly feel most issues and concepts can be addressed most effectively during middle and high school years of study.

- At first I didn't think I taught very much, but looking at all the related areas of agriculture, I cover many topics.

- I probably did more this year than usual because our entire school had a focus on Iowa for a 3 week period. We had speakers and print resources available that we may not have elsewise. My prejudice lies in being a "farm girl" myself--several years removed from the farm but with a more knowledgeable background than many fellow teachers.

- Our first "theme" in the fall revolves around farm and farm animals.

- Would like to see it integrated at the elementary level. Needs to happen.

- I am not opposed to integrating agriculture but do not think it should be a separate subject. Teacher's need help integrating agriculture--training or in-service would be valuable.

- I feel excited about it and more confident since taking FOOD, LAND, & PEOPLE from Duane Toomsen.

- In our 4th grade social studies, we study the regions of the US. In studying each region, we talk about agriculture--crops, animals, etc. We talk about how location and climate affect what is grown.

- Many of our students live on or around farms. When we did our farm unit, there was so much basic information none of them had. I feel it's necessary to their safety and excellent for gaining an understanding of their surroundings.

- I teach in a multi-age classroom. I primarily work with young children ages 6 to 8. We use thematic units throughout the year. In March, our theme is agriculture. It was one of the most delightful units I've ever taught. It is so easy to cover the academic areas through a theme. Literature, writing reports, poetry, thank-you letters, math story problems, planting seeds, maps showing agricultural states, etc. Each student worked on an agricultural project at home and presented it to the class. Family and community members were very willing to serve as resource speakers. I'm totally convinced of the effectiveness of this type of teaching. Nancy Stout, Viola School, Viola, IA 52350 (319) 854-7155.

- I feel this topic is important but the availability of good materials to integrate into the curriculum are scarce. There is so little time that the only way this is going to work is to integrate.

- We've been using a 2 year cycle materials provided by our local Farm Bureau -- they are excellent. Also our science program allows a choice of curriculum labs. Our ag. teacher at the high school is very cooperative and interested in expanding.

- Integrated - grade appropriate.

- Many lend themselves to Science (which I don't teach) and to Social Studies (I do teach).

- I am a P.E. teacher and Health Instructor. We have a nutrition but do not discuss agriculture specifically. I should research and do more (some) agriculture activities in class because I teach in a rural community. Thank you for including me in your survey.

- In an agricultural community like ours, agriculture is easily adapted to discussion for primary children. It is our livelihood and is a part of many daily lives.

- What will happen to our future generations & our environment if we do not implement agriculture into our curriculum? Students deserve to be educated in all areas and subject matters.

- Our social studies curriculum could use additional information. Our books are very limited. If we could supplement the year with additional material this would help a lot. Is there somewhere or someone that we can contact for information? I would like to know about resources.

- I have not yet seen a specific curriculum on agriculture which could be used. I have always come up with my own ideas.

- It can be done anywhere in elementary.

- Since we study regions of U.S., we cover this area often. I feel that it is very important.

REFERENCES

Agricultural academy helps teachers. (1994, July 16). *Iowa Farm Bureau Spokesman.* p. 4A.

American Farm Bureau Federation. (1995). *Farm Facts*. Park Ridge, IL: Author.

Bechely, L,. & Linder, M. (1993). Ag ed in elementary schools. *The Agricultural Education Magazine*, *85*(12), 19-21.

Bennett, M.B., Keyser, R., & Yoder, E. (1993). Community awareness programs: A role for agriculture teachers. *The Agricultural Education Magazine*, *66*(4), 22-23.

Berdie, D., Anderson, J., & Niebuhr, M. (1986). *Questionnaires: Design and Use.* Metuchen, NJT London: The Scarecrow Press, Inc.

Berk, L. (1989). *Child Development*. Needham, MA: Allyn & Balcon.

Bloom, B.S., Engelhart, M.D., Furst, E.J., Hill, W.H., & Karthwohl, D.R. (1956). *Taxonomy of Educational Objectives: Handbook 1 (Cognitive Domain)*. New York, NY: David McKay.

Bodeker, D. (1994, October 15). Cedar Rapids students visit an Iowa farm. *Iowa Farm Bureau Spokesman.*

Bohr, S. (Presentation, November 20, 1996). First Financial Center, Inc.: Cedar Rapids, IA.

Brickell, R. (1997, Spring). Coalition building brings resources/people together. *Food, Land, and People*. p. 4.

Brickell, R. (Correspondence, February 9, 1996). Food, Land, and People: Boulder, CO.

Burress, K. (1994, October 15). We need to speak up. *Iowa Farm Bureau Spokesman*. p. 21.

CAIP: Who are we and what do we do? (1993, Fall.) *The CAIP Connection*, p. 1.

Cheek, J.G. (1985). Elementary and pre-vocational programs in agriculture. *The Agricultural Education Magazine, 58*(4), 4-5.

Coon, T.K. and Cantrell, M.J. (1985). Agriculture in black and white. *The Agricultural Education Magazine*, *58*(4), 22-23.

Daggett, W. (1996). Break the mold. *Vocational Education Journal*, *71*(3), 54.

Davenport, E. (1914). Education for efficiency (rev. ed.) Boston: D.C. Heath.

DeChristopher, R. (1993, November 13). Where does food comes from? *Iowa Farmer Today*. p. 15.

Dewey, J. (1938). *Experience and Education*. New York: Collier Books.

Doerfert, D.L. (1995). If aricultural education were a Coca-Cola®... . *The Agricultural Education Magazine*, *67*(7), 6-8.

Douglas, G.K. (1984). *Cultivating Agricultural Literacy: Challenge for the Liberal Arts*. Battle Creek, MI: W.K. Kellogg Foundation.

Dubes, C.C. (1985). A fun and beneficial program. *The Agricultural Education Magazine*, *58*(4), 15-16.

Educators find allies in teaching about health. (1997, May 3). *Iowa Farmer Today*. p. 16

Everett, S.F. (1985). The prologue of vocational agriculture. *The Agricultural Education Magazine*, *58*(4), 5-8.

Foster, J., and Knobloch, N. (1994). Teaming science and agriculture: An innovative approach to exploratory agriculture. *The Agricultural Education Magazine*, *67*(4), 16-19.

Foundation helps spark a variety of projects. (1994, June 16). *Iowa Farm Bureau Spokesman*. p. 2A

Fox, L. (1932). Agriculture in the grades. *Virginia Journal of Education*, *25*, 272-274.

Frick, M.J. (1988). Counterpoint: Agriculture - more than an ocupation. *The Agricultural Education Magazine*, *61*(6), 13-14.

Frick, M.J., Kahler, A.A., and Miller, W.W. (1991). Agricultural literacy: A framework for communicating to the public sector. *Journal of Applied Communications*, *75*(2), 42-50.

Goecker, A.D., Coulter, K.J., and Stanton, M. (1995). *Employment Opportunities for College Graduates in Food and Agricultural Sciences*. West Lafayette, IN: Purdue University, School of Agriculture.

Glover, J.A. and Bruning, R.H. (1990). *Educational Psychology: Principles and Applications*. (3rd Edition). Glenview, IL: Scott, Foresman/Little, Brown Higher Education.

Herr, R.D. (1968). Instruction in agriculture for elementary school students. *The Agricultural Education Magazine*, *41*(4), 96-97.

Holin, F. (1995, November). Where does bread come from? *Soybean Digest*. p. 29.

Holz-Clause, M., and Jost, M. (1993). *Perceptions and Attitudes of Agricuture: Focus Groups Interviews of Sixth, Seventh, and Eighth Grades*. (Report). Ames, IA: Iowa State University Extension Service.

Horn, J. and Vining, B. (1986). *An Assessment of Students' Knowledge of Agriculture*. College of Education, Kansas State University, Manhattan, KS.

Improving Agriculture's Image. (1997, July 19). *Iowa Farm Bureau Spokesman*. 2nd section.

Iowa Curriculum Planning Model. (1992). Systematic Curriculum Model for Agricultural Education in Iowa. Des Moines, IA: Department of Education.

Iowa Farm Bureau Federation. (1997). *Facts on Iowa Agriculture* (Communications Division, CFB-0-291). West Des Moines, IA: Author.

Iverson, M. (1980). The role of vocational agriculture in the occupational success of graduates: A southern region study. *The Journal of the American Association of Teacher Educators in Agriculture*, *XXI*(2), 11-20.

Johnson County Soil and Water Conservation District. (1993, January). *Non-Farmer Guide to Agriculture*. Brochure. Iowa City, IA: Author.

Johnson County Soil and Water Conservation District. (1993, January). *Environmental Education Workshops: Non-Farmer Guide to Agriculture*. Unpublished manuscript.

Johnson, D. (1994, August 13). Farmers, consumers urged to talk about food. *Iowa Farm Bureau Spokesman*. p. 15.

Johnson, D. (1997, June 21). Farmers now a minority in rural Iowa population. *Iowa Farm Bureau Spokesman*. p. 1, 3.

Keenan, R.G. (1970). Teaching elementary pupils about agriculture. *The Agriculture Education Magazine, 43*(4), 90-91.

Kilman, S. (1995, May 5). Iowans can handle pigs smells, but this is something else; Giant hog 'factories' strain inherent neighborliness of a rural community. *The Wall Street Journal*. p. A1.

Kiplinger Washington Editors, Inc. (1994). *Farm and Food Facts*. Washington, D.C.: Author.

Lichte, J. and Birkenholz, R.J. (1993). Agricultural literacy: Where do we stand? *The Agricultural Education Magazine*, *65*(7), 15-17.

Little, C.E. (1987). *Green Fields Forever*. Washington, D.C.: Island Press.

Lucas, M. (1997, June 1). Ag groups help fund U of I project. *The Cedar Rapids Gazette*. p. 10.

Lucht, G. (1993, November 20). Classroom education replacing advertising. *Iowa Farmer Today*. pp. 14-15.

Lucht, G. (1993, November 13). Farm income takes nibble out of food dollar. *Iowa Farmer Today*. p. 13.

Lucht, G. (1994, August 13). Urban sprawl stalking U.S. farms: Study. *Iowa Farmer Today*. p. 19.

Lykens, B. (Presentation, October 11, 1994). Iowa Farm Bureau Federation: Des Moines, IA.

Lykens, B. (Personal interview, June 20, 1997). Iowa Farm Bureau Federation: Des Moines, IA.

Martin, R.A. (Personal interview, February 12, 1995). Iowa State University: Ames, IA.

Mawby, R.G. (1984, May). Agriculture colleges must take the lead in ending ignorance about farming. *The Chronicle of Higher Education*. p. 72.

Mayer, A. and Mayer, J. (1974, Summer). Agriculture, the island empire. *DAEDELUS*, *103*(3), 83-95.

McReynolds, G. (1985). Mr. Jay and farmland. *The Agricultural Education Magazine*, *58*(4), 17-19.

Moore, E.A. (1993). Agricultural literacy in Michigan: A success story. *The Agricultural Education Magazine*, *65*(12), 10-12, 23.

More training needed. (1996, September). *Techniques: Making Education and Career Connections*. p. 10.

National Research Council. (1988). *Understanding Agriculture - New Direction for Education*. Washington, D.C.: National Academy Press.

Newcomb, L.M., McCracken, J. David, and Warmbrod, J. Robert. (1986). *Methods of Teaching Agriculture*. Danville, IL: The Interstate Printers and Publishers, Inc.

Osborne, E. (1993). Going to extremes. *The Agricultural Education Magazine*, *65*(7), 3-4.

Parsons, F. (1909). *Choosing a Vocation*. Boston: Houghton Mifflin Company.

Peterson, R.L. and Bardusen, O. (1973). Junior-highers explore agribusiness and natural resource programs. *The Agricultural Education Magazine*, *45*(8), 171-172.

Russell, E.B., McCracken, J.D., and Miller, W.W. (1990). Position statement on agricultural literacy. *The Agricultural Education Magazine*, *62*(9), 13-14, 23.

Schneider, M. (Personal interview, June 16, 1997). Mid-Prairie Schools: Wellman, IA.

Shepard, D.W. (1970). Orientation to careers in agriculture. *The Agricultural Education Magazine*, *43*(4), 84.

Shively, W.H. (1936). Teaching objective for agriculture in the elementary schools. *The Agricultural Education Magazine*, *8*(7), 101, 103.

Skolnik, R. (1995). Doctor, lawyer...technical chief? *Vocational Education Journal*, *70*(7), 36-37, 55.

Staller, B. (1997, Spring). FFA and FLP form win-win partnership. *Food, Land, and People*. p. 3.

Steiner, D. (Personal interview, March 1, 1997). El Paso Community School: El Paso, IL.

Students: What are they thinking? (1993, Fall). *The CAIP Connection*, p.1.

Swan, M.D. and Donaldson, G.W. (1970). Helping elementary pupils learn about agriculture. *The Agricultural Education Magazine*, *42*(11), 282-283.

Tasty news. (1995, Fall/Winter). *The CAIP Connection*. p. 1.

Thompson, P. (1986). *Defining Agricultural Literacy*. Battle Creek, MI: W.K. Kellogg Foundation.

Trexler, C.J.. (1994). Building capacity for an innovative elementary agriscience curriculum. *The Agricultural Education Magazine*, *67*(1), 16-19.

TV viewers learn about ag. (1994, August 27). *Iowa Farm Bureau Spokesman*. p. 3.

USDA seeks to stem decline of family farms. (1997, June 1). *The Cedar Rapids Gazette*. p. 10C.

What is CAIP? (1995, December). *Lamb and Wool*. p. 1.

Williams, C. (FLP Chair). (1996, February). *Project Food, Land, & People*. (Available from Dr. Lyn Fleming, 11220 East Stetson Place, Tucson, AZ 85749-9550).

Wolfson, I.L. (1970). Agricultural education for elementary and junior high school students. *The Agricultural Education Magazine*, *42*(11), 273-275.

Wood, J. (Correspondence, April, 1997). University of Illinois: Champaign, IL.

Yates, J. (1994, May 26). Kalona kids farm new ideas. *Iowa City Press-Citizen*. p. 1B.

Zinkand, D. (1993, November 20). Groups study Iowa ag literacy. *Iowa Farmer Today*. p. 12.

ACKNOWLEDGEMENTS

This study was made possible because of the support of key people who helped in many ways towards the completion of this project:

June - a sincere, heart-felt thanks for your support, prayers, listening, typing, proofreading, and taking care of extra house chores; moreover, thanks for giving extra attention to our son, Grant, while this project was in progress.

Knobloch and Mogler families - thanks for your support and understanding the commitment of this project when we would travel and spend time together.

Johnson County Natural Resources Conservation Service - thanks to the volunteers who collated the mailing of 689 envelopes for the mailing.

Grant Wood Area Education Agency, especially Kay Graber - thanks for supplying the labels of all the elementary teachers in AEA 10; also, thanks for the service of distributing the surveys through the van mail delivery system.

Elementary teachers in the Grant Wood AEA - thanks for your time in completing the survey and providing feedback and information to make this study possible.

Dr. Gordon Cook - thanks for your input in writing the survey instrument and providing the school demographic information from the department of education.

Mr. Ray Schrepfer - thanks for taking time to visit about my career goals and aspirations. Further, thanks for your support and motivation in completing this project.

Mr. Mark Schneider - thanks for your time, feedback, and motivation on developing the Wheel of Agriculture model.

Dr. Alan Kahler and Dr. Gail Nonnecke - thanks for your time, ideas, and constructive comments while serving on the Program of Study Committee.

Dr. Robert A. Martin - thanks for your time, encouragement, support, and guidance through this major project. I appreciated your willingness to help and motivation to complete the research study. Also, thanks for being a professional role model who has given me the aspirations and ideals to be a professional in agricultural education.

Most Importantly - "I can do all things through Christ which strengtheneth me." (Phillipians 4:13, KJV)

VITA

NAME OF AUTHOR: Neil A. Knobloch

ADDRESS: 1431 Angle Road S.W., Kalona, Iowa 52247

DEGREES AWARDED:

B.S. in Agricultural Education and Ag. Extension Ed., Iowa State University, 1992

PROFESSIONAL EXPERIENCE:

Agriculture Teacher & FFA Advisor, Mid-Prairie Junior and Senior High Schools, Wellman, Iowa, 1992-1997

HONORS AND AWARDS:

The Governor's Council on Agricultural Education, 1996-1997

Outstanding Young Educator Award, Iowa Vocational Association, 1997

Outstanding and Dedicated Service Award, Mid-Prairie FFA, 1997

Governor's Council Award of Excellence:

- Best Use of Advisory Committee, 1997
- Integration of Science and Agriculture, 1995

Iowa Vocational Agriculture Teachers' Assocation

- Outstanding Young Member, Southeast District, 1995
- Ideas Unlimited Awards
  - Overall State Winner, 1996
  - Student Organizations, 1993 & 1996
  - Classroom Activities, 1995 & 1996
  - Adult Education, 1995

Mid-Prairie Education Association

- Teacher of the Year Nominee, 1996 & 1997

Graduated with distinction, Iowa State University, 1992

Gamma Sigma Delta: The Honor Society of Agriculture at Iowa State, 1992

PROFESSIONAL PUBLICATIONS:

Foster, J. and Knobloch, N. 1994. Teaming Science and Agriculture: An Innovative Approach to Teaching Exploratory Agriculture. *Agricultural Education Magazine*. 4:16-19.