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Michigan agriscience and natural resources teachers' perceptions of the impact of the agriscience and natural resources curriculum on local agriscience programs

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MICHIGAN AGRISCIENCE AND NATURAL RESOURCES TEACHERS' PERCEPTIONS OF THE IMPACT OF THE AGRISCIENCE AND NATURAL RESOURCES CURRICULUM ON LOCAL AGRISCIENCE PROGRAMS

By

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ABSTRACT

MICHIGAN AGRISCIENCE AND NATURAL RESOURCES TEACHERS' PERCEPTIONS OF THE IMPACT OF THE AGRISCIENCE AND NATURAL RESOURCES CURRICULUM ON LOCAL AGRISCIENCE PROGRAMS

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Change in education is inevitable. Over the past decade changes that occurred have effected the way schools and school personnel now function. These changes are particularly apparent in the area of curricular reform.

To address the changes impacting education in Michigan, a group of teachers of agriculture in Michigan formed a committee to provide guidance and direction for agricultural education. The committee recommended that a major new thrust was needed in the secondary schools' curriculum. As a result, the Michigan Department of Education contracted with the Department of Agricultural and Extension Education and Michigan State University to develop a model Agriscience and Natural Resources Curriculum for agricultural education programs in Michigan.

Following the development of the curriculum, a set of guidelines were established, titled "Standards For Excellence." These guidelines were designed to ensure quality programs for Michigan's students interested in

agricultural and natural resources. The guidelines were implemented through a restructuring process.

Also included as a part of the restructuring process was the completion of 86 hours of inservice instruction for the teachers. This inservice instruction coupled with the completion of the Standards For Excellence process and use of the new Michigan Agriscience and Natural Resources Curriculum formulated the restructuring process.

This study sought to determine if change had taken place in Michigan's secondary agricultural education programs based upon the adoption of the Michigan Agriscience and Natural Resources curriculum, as perceived by Michigan's agriscience teachers. The research also sought to determine if the implementation of the curriculum had taken place consistent with the goals and objectives of the Standards For Excellence.

The results showed that agriscience teachers used more of the curriculum after restructuring and their students received a much broader variety of credit. The agricultural curriculum was reviewed and approved by a much broader audience. The agriscience teachers perceived the curriculum had allowed them to integrate more principles and concepts taught in other academic areas within the curriculum, allowed them to teach at a higher level of learning and improved their instructional strategies. The teachers perception of various FFA and SAE components had also increased since restructuring their programs.

To my beloved wife, Cammie,
whose support and assistance helped make this possible,
and to my daughter, Alexis.
Also to my family and friends
who supported and encouraged me along the way.
And to God
for giving me the perseverance
and endurance to make it to the end.

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CHAPTER I

INTRODUCTION

Reorganizing schools is of foremost importance to educators today. After many attempts to reform schools, the educational community is seeking to fundamentally change the way we work with students, teachers, parents, administrators and the community.

According to Louis et al. (1981), the push for school change comes from all directions. Parents, taxpayers, media, state and federal legislators, administrators and teachers all agree that change must occur at local district and state levels if we are to succeed in increasing educational productivity. Parents are concerned because they want their children to acquire the skills and the preparation needed to compete and survive in today's society. They know that education is a major factor in subsequent employment; they understand that basic reading, writing and math skills are needed in all aspects of life. Yet parents read in newspapers and magazines that math and reading scores are declining, and they worry about their children's futures.

Taxpayers are also concerned. They want to know that the money being spent is money well spent. It angers them to hear that in some places it is possible for students to pass through high school and still be functionally illiterate. In response to these concerns, some state legislators and school boards have mandated local planning to increase the effectiveness of basic skills instruction. Others have established testing programs to increase school accountability for pupil achievement levels.

It would be a mistake, however, to assume that all the pressure for school reform has come from outside the schools. The impetus for change has also come from teachers and other concerned professionals. Educators have suggested that if today's students are to meet the challenges of tomorrow's society, schools must go beyond traditional structures and organization to explore new options. To accomplish this, educators have begun to focus on how we address issues concerning professionalism, governance, accountability and, especially, curriculum and instruction. (ASCD, 1991).

Beginning with the release of A Nation At Risk (1983), dozens of national studies have emerged that criticized public education and created a demand for schools to strengthen their curricula. Educational policy makers have responded by increasing the number of academic credits for high school graduation in hope that more time in mainline

content areas will increase achievement levels and assure America's competitive edge in the future (White, 1988).

In the meantime, technology is changing the workplace at an incredible rate and access to vocational education becomes more important than ever. According to White (1988) "all students can benefit from vocational courses that help them better cope with the more complex work environments. " Although many academically successful students may plan to pursue formal postsecondary education, vocational courses help develop the ability to apply concepts and principles, thereby increasing skills needed to solve practical problems. Laboratory--style learning environments in high quality vocational education also emphasize individual and group processes that can develop self-reliance and teamwork (White, 1988).

Another report, With Consequences for All (1985), published by the Association for Supervision and Curriculum Development (ASCD), reasoned that if increased emphasis on core subjects causes vocational programs to be scaled down or eliminated, the effects will be most negative for the roughly 24 percent of students likely to enter the work force immediately upon graduation. For this group, decreased or limited access to courses that promote their retention in school and enhance their employability will reduce rather than increase learning (Frantz, et al. 1986).

The response to educational reform by most states does

show a strong commitment to improving the quality of education received by students in secondary schools. However, it ignores differences in student interests and abilities, and it ignores the needs of those high school students who do not plan to go to college and who purposefully choose a vocational program. A system of rigid academic requirements ignores individual differences. It screens out those who do not fit the mold.

Because of the criticism of our educational system, the National Commission on Secondary Vocational Education (1984) concluded that recent study reports have not adequately dealt with the role of secondary vocational education in addressing the problems of quality in American education. The National Commission also concluded that secondary students are a diverse group, varying in background, ability and aspirations. Thus, a variety of educational approaches should be used to address those diverse needs.

Another assumption by the National Commission was that those who are closest to the students can best understand what educational alternatives should be provided. Therefore, the most useful reforms and methods of restructuring curriculum start at the grass roots, emanating from the local schools and classrooms. The National Commission believes that state and national mandated reform tends to be least effective.

And, finally, the National Commission concluded that

education transcends schooling. It should include the students in the home, school, community and work place. Therefore, educators must work closely with local community partners to best coordinate educational reform.

Because of the National Commission on Secondary Vocational Education's report, The Unfinished Agenda, most disciplines within vocational education have adopted new missions and goals to expedite vocational education reform on local and state levels. It was this report that helped begin the revitalization of vocational education in Michigan.

During the fall of 1986, Michigan's Governor Blanchard signed an executive order establishing a task force to study and make recommendations on revitalizing agriculture through research and education in Michigan. This was an outgrowth of recommendations from the Governor's Conference on Agriculture in November, 1985. At that time, one of the 16 workshop groups at the Governors's Conference, focused on the crisis in agricultural education. A report was then prepared for the Michigan Council on Vocational Education entitled, A Report on the Status and Future Direction of Vocational-Technical Agriculture Education in Michigan (1987). The report showed an absence of information identifying the status and characteristics of present day Michigan programs in the vocational agriculture area. Therefore, descriptive reports were needed to design a long

range planning process that could be the basis for a redirection and renewal of the agricultural education programs in the state. One of the recommendations from the Governor's Task Force Report on the Status and Future Direction of Vocational-Technical Agriculture Education in Michigan was to fund, guide and support statewide and locally-based agricultural education programs in the area of agricultural curriculum development.

The Michigan Association of Teachers of Vocational Agriculture (MATVA) Board of Directors appointed a committee to determine the direction vocational agriculture should take. The Board concluded that they should form a partnership with the Michigan Department of Education (MDE) and Michigan State University (MSU) to provide guidance and direction for agricultural education. This committee was entitled "Agriculture in the year 2000". The committee held a series of meetings with various groups, like the Michigan Association of Teachers of Vocational Agriculture, to identify the problems and needs of agricultural education. The committee recommended that a major new thrust was needed in the secondary schools curriculum. As a result of the fore-mentioned studies, the Michigan Department of Education, in 1989, contracted with the Department of Agricultural and Extension Education at Michigan State University to develop a model agriscience and natural resources curriculum for agricultural education programs in

Michigan. The curriculum that was designed used agricultural and natural resources content and experiences as a context for integrating principles and concepts from many disciplines. For example, the curriculum focuses on utilizing content as a means for:

- developing process abilities to think critically
- improving basic skills like reading, writing and math
- making decisions
- solving problems.

The application of these concepts and principles was in the areas of agriscience/agribusiness and natural resources (Elliot & O'Connell,1990).

Following the development of the basic core curriculum units, vocational agriculture programs in Michigan began a restructuring process in order to be officially recognized as agriscience and natural resources programs by the Michigan Department of Education. Part of the restructuring process consisted of a set of guidelines, titled "Standards for Excellence" (Elliot & O'Connell, 1990).

These guidelines were developed through a literature review process, panel of experts forum and an ad hoc committee to the curriculum project. The primary goal was to ensure quality programs for Michigan's students interested in agriculture and natural resources. The "Standards For Excellence" was designed to be community based and to combine the expertise of community members,

educators, counselors, administrators and state staff. The "Standards for Excellence" entailed four major phases:

- Preparation Phase
- Review Phase
- Action Plan Phase
- Implementation Phase

The PREPARATION PHASE consisted of the selection and training of key local leaders and educational representatives for the review committee. The review committee was to consist of at least nine members with individuals from the following groups represented:

- Agriscience and natural resource teacher.
- Counselor / or general education teacher.
- Support service personnel.
- Two representatives from agricultural business or industry.
- One current or former student.
- One parent of a current or former student.
- One current board-approved advisory committee member.
- State staff.
- Other

In addition to committee member selection, the agriscience and natural resources teacher was to compile the recommended resource materials.

The REVIEW PHASE consisted of a two-step process. During the first step each committee member independently

reviewed the support material and observed the program in operation. The "Standards For Excellence" was broken into eight major sections.

- Philosophy
- Secondary instructional program
- Student services
- Instructional staff
- Facilities / equipment
- Advisory council / community involvement
- Finance
- School personnel

Within each section quality indicator statements are used to direct the review process. Each committee member individually ranked each of the general / quality indicators statements as "Strong", "Adequate", or "Below Standards". A strong ranking indicated that the program was strong regarding this point (above standards). An adequate ranking meant an acceptable level regarding this point and a change may need to be recommended (meets standards). A below standard ranking meant that change needed to occur in this area.

The final standards guide was to be completed as a committee. It was the responsibility of the agriscience and natural resource teacher to complete Section I - Community and II - Population of the Standard Guide.

In the ACTION PLAN PHASE the committee developed an

Action Plan for improving and upgrading the agriscience and natural resource education program. This document was submitted to school administrators, agricultural advisory board members and the state supervisor of agriculture education or his/her representative.

In the IMPLEMENTATION PHASE the agriscience and natural resource education program should be redirected and upgraded by observing the recommendations in the Action Plan. This would be the last phase of the three-year process, and then the cycle would begin again.

Specific objectives of the "Standards For Excellence" was to: provide information to local personnel for redirection of the program to meet the present and future needs of agriscience and natural resources education students; serve as a model for reviewing all existing programs and give a guide for new or expanding programs; provide direction for program improvement; and provide direction for financial support.

Also included as a part of the restructuring process, teachers were required to complete a minimum of 86 hours of inservice instruction in the areas of natural resources, animal science, plant science and business management and marketing. This inservice instruction coupled with the completion of the "Standards For Excellence" and use of the new Michigan Agriscience and Natural Resources Curriculum formulated the restructuring process.

Statement of the Problem

Agricultural education in Michigan has taken serious, progressive steps in revitalizing agricultural programs by recognizing the need to change instructional programming, preparing to change instructional programming, developing plans, and implementing new programming. Individuals within local agriscience departments, Michigan State University, and the Michigan Department of Education understand the importance of an evaluation process to determine the success of curricular reform and to improve future curricular reform in agricultural education for Michigan.

Purpose

This study was conducted to determine if change has taken place in Michigan's secondary agricultural education programs based upon the adoption of the Michigan Agriscience and Natural Resources Curriculum. This research also was conducted to determine if the implementation of the Agriscience and Natural Resources Curriculum was taking place consistent with the goals and objectives of the Michigan Agriscience and Natural Resources Education Programs "Standards for Excellence", April 1990.

Research Questions

1. To what extent do Michigan agriscience teachers report using various Michigan Agriscience and Natural Resource Curriculum guides?

2. Have local secondary agriscience course titles changed due to curriculum restructuring?
3. What type of credit (vocational, science, business, etc.) are agriscience and natural resource courses receiving before and after restructuring?
4. To what degree do the Michigan agriscience teachers report they are teaching unit and topic areas suggested by the Michigan Department of Education?
5. To what degree do Michigan agriscience teachers report using various levels of Bloom's taxonomy both before and after restructuring of the Michigan Agriscience and Natural Resource Curriculum?
6. To what degree do Michigan agriscience teachers report integrating concepts and principles taught in other academic areas both before and after restructuring of the Michigan Agriscience and Natural Resource Curriculum?
7. To what degree do Michigan agriscience teachers report using varieties of instructional methods used to deliver the Michigan Agriscience and Natural Resource Curriculum both before and after restructuring?

8. Did various local educational committees approve the Michigan Agriscience and Natural Curriculum both before and after restructuring?
9. Was the local Agriscience and Natural Resources Curriculum being articulated with post secondary institutions both before and after restructuring?
10. What are agriscience teachers' perceptions of various statements regarding the FFA and SAE before and after restructuring?
11. What is the relationship between the implementation of the Michigan Agriscience and Natural Resources Curriculum and selected demographic characteristics of Michigan agriscience teachers?

Definition of Terms

To facilitate better understanding of this study, several terms commonly used in agriscience and natural resources education will be defined.

Agricultural education will be defined as the discipline concerned with formal education in and about agriculture.

Agricultural education program will be defined as formal program of education in and about agriculture in Michigan secondary schools.

Agricultural educator will be defined as a professional certified to teach agriculture/agriscience and natural

resources education in Michigan secondary schools.

Agriscience is an emerging term used to describe agricultural programs in Michigan.

Agriscience and natural resources will be defined as the application of agricultural and natural resources principles and practices to the teaching of science to elementary, middle school, and high school students.

FFA will be defined as the student leadership organization that is an integral part of the Michigan agriscience and natural resources education programs.

Michigan Agriscience and Natural Resources Curriculum is the name selected by the Michigan secondary agricultural teachers to represent the new curriculum focus in Michigan.

Perceptions will be defined as the process by which an individual makes differentiations in his/her perceptual field or calls to the front with a degree of clarity certain events over others. This process of differentiating events and relationships between or among events constitutes the field of personal meaning for the individual at a given time (Combs et al., 1976).

Restructuring will be defined as the rethinking of what educators have been doing, determining what works and changing what doesn't. It means looking at something from new angles and then making the changes necessary to bring all elements in line with the new vision (ASCD, 1991).

SAE will be defined as supervised agricultural experience programs that are an integral part of the Michigan agriscience and natural resources education programs. These programs are hands-on experiences that students complete, reinforcing classroom information.

"Standards for Excellence" will be defined as a set of guidelines that is designed, through a review process, to ensure quality educational programs for Michigan's students interested in agriscience/agribusiness and natural resources.

Vocational Agriculture is defined as classes formerly taught in secondary schools that provided opportunities for students to prepare for, or advance in, occupations requiring knowledge and skills in agriculture.

Limitations of the study

This study was limited to 102 out of 116 agriscience and natural resources teachers who completed restructuring prior to June 30, 1993. The teachers must have completed one year of teaching and be teaching during the 1993-94 school year. The study was also limited to the desired goals and objectives of the Michigan Agriscience and Natural Resources Education Programs "Standards For Excellence", April, 1990.

Basic assumptions

The researcher assumed the results of the survey questionnaire were an accurate portrayal of Michigan

agriscience teachers perceptions regarding curriculum reform in Michigan. The researcher also assumed that the respondents went through the restructuring process and understood both process and content. All respondents should have completed the "Standards for Excellence" and should hold a vocational and/or teaching certificate. It is assumed that all respondents should have completed or are working toward the completion of the required 86 hours of inservice credit. It is assumed teachers had a formal review committee during the restructuring process. The researcher also assumed that the affects of maturation and history could have affected the perceptions teachers hold regarding the restructuring of Michigan's curriculum. The researcher assumes that an individual's perceptions are influenced by his/her interaction with external forces and that an individual's perceptions are important factors influencing his/her behavior.

CHAPTER II

REVIEW OF LITERATURE

Introduction

This chapter contains a review of literature related to the salient topics in this study. The chapter is organized into seven sections. Section one examines educational reform and the demands for educational excellence. Section two considers vocational reform and its impact on general educational reform. Section three explores the general and curricular reform in agricultural education. Section four gives a brief history of Michigan's movement to reform vocational education, and more specifically, agricultural education. Section five examines basic principles and studies in curricular reform. Section six studies change and its importance in curricular reform. And, finally, section seven provides a basic understanding behind the concept of perception.

Section I

Demands For Educational Excellence

The 1980's was a decade of controversy regarding public education. The A National At Risk report from the National

Commission on Excellence in Education (1983) sparked a national debate on education by raising numerous controversial issues. Among them were declining graduation standards and student mastery of basic skills, rising dropout rates, increasing shortage of teachers and other problems related to educational reform.

Initial educational reforms, derived largely from "top down" legislative mandates, encompassing more than 700 statutes, appearing across the nation. These measures reflected the widespread public belief that American education was failing the national interest due to:

> laxness, an abandonment of standards and accountability. The response, therefore, was more often than not to get tough; to raise standards, tighten accountability, increase testing, beef up the curriculum, and demand better teachers and better teaching (Hill, 1989, pg.).

The underpinning assumption of these initial reports was that education serves as a "utilitarian rather than an intrinsic value," meeting national needs of security and economic well-being. Also stressed in initial school improvement efforts was equity issues. Many educators believe that quality in education must be expanded to embrace all students in all schools, and that education must be redesigned to foster success in all educational environments (National Commission on Excellence in Education, 1983).

During the late 1980's educational reform efforts stressed that educators, not legislators, should take

primary responsibility for revitalizing public education. In an address to the American Education Research Association in 1986, Theodore Sizer argued for local educational control, stating, "the decentralization of substantial authority to the persons closest to the students is essential." He urged educational reforms to be courageous and bold:

> to challenge the regularities--the routines and activities that are so familiar they are habitual. We even fail to question them. There are so many in school-curriculum, departments, grades, scheduled periods, (those 53 minute snippets of time), and particularly the metaphor of giving an education...nothing is beyond questioning (1990, pg.).

New thinking and examination of the basic goals, functions, and structure of American public education have created a demand for more than mere school improvement. The demand for educational restructuring is seen as vital to ensure growth in the promotion of learning. At the recent Michigan School Restructuring Conference, Sizer (1986), paraphrasing Marshall McLuhon, remarked that restructuring means that we do "not drive faster and faster into the future, trying to steer by using only the rear-view mirror."

In 1986, five national reports emerged, and all condemned the removal of decision-making authority from

teachers and principals. The Holmes Group (1986), the Carnegie Task Force on Teaching as a Profession, the National Governors' Association, the Education Commission of the States, and the Association for Supervision and Curriculum Development all supported a move from educational change imposed from those outside education, to educational improvement efforts by teachers and administrators.

Although Futrell (1989) recognized that education drives the economy, she stated, "we do a disservice to students if we offer them no more than a curriculum designed to advance economic goals or to serve utilitarian objectives" (p.13). She further noted that

> reform has as its focus an education that prepares tomorrow's adults to meet ethical as well as economic imperatives - that prepares them not only for a life of work but also for a life of worth (p. 14).

McDaniel (1989) viewed the reform movement of the 1980s as having just about run its course and saw the new reform agenda as one focusing on human and social needs, rather than economic and industrial ones:

> It will likely concern itself with such issues as the empowerment of teachers, the improvement of the school climate, the development of students' creativity and critical thinking skills, and stronger links between schools and the communities they serve (p.17).

According to McDaniel (1989) the needs and ideas of students and teachers will be the focus of more personalized education. Principles of organizational leadership employing quality circles and participatory decision-making can be applied to education as well as to business and industry. As McDaniel states, "This new reform agenda is likely to come from the bottom up and to emphasize 'democratic' leadership by principals" (p. 17).

Finn (1990), in speaking of a new definition for education, stated that "changes are worth making only if they yield greater learning" (p. 590). President Bush supported this new philosophy at the "education summit" in 1989 in Charlottesville, Virginia, when he said "We'll judge our efforts not by our intentions but by our results" (p. 591).

A paradigm shift was seen by Finn (1990) as vital to the new reform movement. The old conception of education was that it was input-based, with improvements centered on spending more money, providing more services, and delivering them more efficiently. The new paradigm defines education as the result achieved:

> Only if the process succeeds and learning occurs will we say *education* happened. Absent evidence of such a result, there is no education- however, many attempts have been made, resources deployed, or energies expended (p. 586).

Phillip C. Schlechty has argued that restructuring goes far beyond mere improvement (1990). "School improvement,"

he argued, "is improving how we follow the present rules, roles, and relationships. Restructuring goes further--it challenges us to do something that has never been done before." Further, those in positions of educational leadership must use their authority "to create a system in which people are encouraged to think and act in a purposeful manner. Only when educators realize that their business is student progress and their profit, student learning, will school improvement become a reality."

Several other reports criticizing American public secondary education have received national attention. The National Commission on Excellence in Education was charged with examining the quality of education in the United States and, subsequently, to make a report to the Nation and to the Secretary of Education. The ensuing report, A Nation At Risk: The Imperative for Educational Reform (Commission Report, 1983), addressed the following:

* Assessing the quality of teaching and learning in our nation's public and private schools, colleges and universities
* Comparing American schools and colleges with those of other advanced nations
* Studying the relationship between college admissions requirements and student achievement in high school
* Identifying educational programs which result in

notable student success in college

* Assessing the degree to which major social and educational changes in the last quarter century have affected student achievement
* Defining problems which must be faced and overcome if we are to successfully pursue the course of excellence in education

Another report to achieve widespread press was compiled by the Task Force on Education for Economic Growth: Action for Excellence. A Comprehensive Plan to Improve Our Nation's Schools. Eight Action Recommendations were proposed by the committee (Task Force Report, 1983):

1. Develop--and put into effect as promptly as possible--state plans for improving education in the public school from kindergarten through grade 12.
2. Create broader and more effective partnerships for improving education in the states and communities of the nation.
3. Organize the resources which are essential for improving the public schools.
4. Express a new and higher regard for teachers.
5. Make the academic experience more intense and more productive.
6. Provide quality assurance in education.
7. Improve leadership and management in the schools.

8. Serve better those students who are now unserved or undeserved.

Another report to gain extensive public attention is the Carnegie report offering a plan for high school reform. High School: A Report on Secondary Education in America, a study by the Carnegie Foundation for the Advancement of Teaching, presents an agenda for action to improve our nation's secondary schools. The report identifies twelve themes that provide a framework for reform (Boyer, 1983):

1. Clarifying Goals
2. The Centrality of Language
3. The Curriculum as a Core
4. Transition to Work and Learning
5. Service: The New Carnegie Unit
6. Teachers: Renewing the Profession
7. Instruction: A Time for Learning
8. Technology: Extending the Teacher's Reach
9. Flexibility: Patterns to Fit Purpose
10. The Principal as Leader
11. Connections
12. Excellence: The Public Commitment

Transition to Work and Learning, another report, gives credence to the importance of preparing students for the changing nature of the world of work (Boyer 1983):

> The high school should help all students move with confidence from school to work and further education. Today, we track students into programs for those who "think" and those who "work," when in fact, life for all of us is a blend of both. Looking to the year 2000 we conclude that, for most students, 12 years of schooling will be insufficient. Today's graduates will change jobs several times. New skills will be required, new citizenship obligations will be confronted. Of necessity, education will be lifelong (pg.355).

As American society in the last decade of the 20th

Century experiences major transformations in virtually every aspect of its environment, the transformation of mainstream values, economic changes and competition, and technological advancements, so will American schools have to be transformed. The impact of these changes on education will be profound. It is therefore imperative that educators continually scan the external environment for change, strategically plan for the change process, and implement educational policies and practices which respond to changing needs.

Section II

Vocational Education Reform

In reviewing national reports on the state of education today, one can see the lack of consideration for the needs of students wishing to pursue vocational programs. The push for academic excellence, too often, appears to exclude vocational education. Gordon Swanson (1983), in commenting on these national reports, expressed concern that they confused means with ends. He felt three essential questions need to be addressed by policy makers in discussing excellence in education--what should be taught, to whom, and for what purpose? The national reports on excellence focused on the first question but ignored the more important second and third questions.

In contrast to these reports on secondary education, the National Research Council Committee on Vocational

Education and Economic Development in Depressed Areas prepared a comprehensive report on the role vocational education should play in secondary education. In their book, Education for Tomorrow's Jobs (Sherman 1983), the committee states:

> Vocational education is a vital part of the public education system in this country, one that has long been slighted in favor or academic education. Basic academic as well as occupational skills are of fundamental importance in preparing young people for productive lives in our society. The public elementary and secondary schools in this country should offer students who will not go to college a thorough grounding not only in language skills, reasoning, and mathematics, but also in the mechanical and technical skills and work habits that will prepare them for working life (p. 1).

The committee for Economic Development in 1985 issued a report, Investing in Our Children: Business and the Public Schools. Part of the warning signs they cite in education reflect employer dissatisfaction:

> Employers in both large and small businesses criticize the lack of preparation for work among the nation's high school graduates. Too many students lack reading, writing, and mathematics skills, positive attitudes toward work, and appropriate behavior on the job. Nor have they learned how to learn, how to solve problems, make decisions, or set priorities. Many high school graduates are virtually unemployable, even at today's minimum wage (p. 2).

A Nation At Risk and many of the other studies of the 1970s critical of public education focused on academic success and basically ignored the non-college bound student. Investing in Our Children specifically focuses on the needs of all students, including those not going on to college. This committee recommends that the term "vocational

education" be restricted to specific preparation of students to enter a field upon high school graduation. They then advocate that students be required to demonstrate achievement of an adequate level of academic competence before completing occupationally specific training. They also recommend close business linkages with education.

The Center for Public Resources surveyed educators and employers in 1982 for their views on basic skills deficiencies among high school graduates entering the work force. The results revealed that there was a considerable gap between the perceptions of school officials and the perceptions of employers when it comes to the adequacy of education for employment (Task Force Report, 1983). Employers were more critical of basic skills deficiencies.

Another study (Richardson, 1981) synthesized 11 earlier studies of employer expectations for young employees. Expectations centered on: basic academic skills, communication skills, knowledge of the world of work, interaction with fellow workers and superiors, positive attitudes toward work, dependability, craftsmanship and productivity. In looking at employer attitudes toward and perceptions of the deficiencies in the job performance of young people, one study of over 800 employers uncovered three basic problem areas: 1) poor performance in basic skills, particularly oral and written communications; 2) poor work attitudes; and 3) a general lack of understanding

about the world of business (Owens, 1983).

Identifying excellence in vocational education demands an understanding of what vocational education is intended to accomplish. Defining the purposes and expected outcomes of vocational education has been one of the biggest obstacles in planning and evaluating secondary vocational education. Although numerous studies of secondary vocational education have occurred, no consensus exists as to the key aspects of vocational education that should be measured (Darcy, 1979). Various approaches have been used to determine effectiveness of vocational education programs.

Research has shown the relationship of certain reform practices to student achievement. It becomes obvious, when reviewing school effectiveness literature, that conclusions regarding specific factors that lead to effective schools are tentative and should be viewed with caution. Variations in findings of school effectiveness are widespread; studies of expenditures, facilities and teacher qualifications, for example, have not been consistent in explaining the differences in student achievement as measured by standardized tests. Yet, other factors have been shown to be more effective, as evidenced from data generated by the Goal Based Education Program at the Northwest Region Educational Laboratory and by other researchers. The work of these groups indicates that research and development processes and results can be used for local school

improvement in a variety of contexts. The Goal Based Education Program has found that the following factors, when interrelated, are conducive to learning: 1) a clearly defined curriculum; 2) focused classroom instruction and management; 3) ongoing assessment and evaluation of students and programs; and 4) strong instructional leadership (Effective Schooling Practices 1983).

Integration of Academic and Vocational Education

One principle resulting from the 1983 A Nation At Risk report was the concept of integration of academic and vocational education. The issue of integration is not new. Phelps and Cole (1988) pointed to three major problems identified by John Dewey regarding the vocationalism movement of the early 1900s. These problems included "conceiving the content of the field as too narrowly technical, limiting its focus to trades rather than multiple vocations, and introducing it too early in the curriculum" (p. 4).

Integration refers to the application of both academic and vocational training methods and curricula to improve both basic skills learning and technical training for today's workplace. The Perkins Act, regulating federal funds for vocational programs, requires that all federally funded programs integrate academic and vocational education. Requirements apply equally to secondary and postsecondary programs.

The National Commission on Secondary Vocational Education (1984), in The Unfinished Agenda, found that "all secondary students need a balance of both academic and vocational experience to prepare themselves for life in a changing world" (p. 23). The Commission recommended that

> Secondary vocational education courses should provide instruction and practice in the basic skills of reading, writing, arithmetic, speaking, listening, and problem-solving. This addresses the current demand for the new basics without locking all students into the academic classroom (pp. 25-26).

Several approaches to the integration of academic and vocational education have been used. Identifying academic concepts covered in vocational courses has resulted in some school systems granting credit toward the academic requirements for graduation. Many vocational programs include instruction in math, science and communication. These basic skills are carried one step further by applying them to practical situations.

Two main factors contributed to this recent emphasis on integration. First, the increase in academic credits required for graduation in many states and school districts has diminished the time available for elective courses, including vocational programs. However, analysis of vocational courses revealed considerable academic content which was not being recognized as meeting high school graduation requirements.

Secondly, corporate leaders expressed concern that vocational graduates entering the work place were unable to

communicate, solve problems, or demonstrate basic technological literacy. Their lack of basic skills affected job safety, employee relations and job training. Meeting the needs of students and employers alike would require renewed emphasis on basic skills. However, rather than the three Rs, Francis Tuttle (1988), past president of the American Vocational Association, regards basic skills as the four Cs - communication, computation, computer literacy, and critical thinking.

Business people have cited an inadequate reading level as the greatest obstacle to a new employee's success. Competency in writing, speaking, and listening, as well as in math skills are vital to employee success and satisfaction. The ability to reason, assimilate information, predict outcomes, and communicate information are seen as essential supplements to the job--specific training traditionally received in vocational programs. Also, without computer literacy, vocational graduates may lose jobs to those who are better prepared to meet the needs of modern technology (Tuttle, 1988).

Because efforts to integrate academic and vocational education are still in their infancy, it is somewhat difficult to define what can or should be done. The Perkins Act requires a "coherent sequence of courses," which suggests a planned, carefully coordinated effort over time. However, there are no clear program guidelines.

National Center for Research in Vocational Education researchers have identified several integration models, ranging from modest efforts to increase remedial education within existing vocational courses to determined efforts to restructure schools. A couple of these models include: incorporating more academic content in vocational courses; making academic courses more vocationally relevant- "applied academics"; and curricular "alignment," modifying both academic and vocational education. Many schools are experimenting with these models and adjustments to existing curricula (United States Department of Education, 1992).

Vocational education has been virtually overlooked in the educational reform movement; however, vocational schools and programs will play a major role in providing many of the solutions to the problems that have been identified in America's schools. Our nation's economic strength and competiveness depend upon our ability to build and maintain a competitive work force. While education reform efforts have brought about undeniable progress, many experts agree that the non-college bound youth and dropouts have been least affected. Vocational educators must take aggressive action to close the gaps that exist between work place needs and work force capabilities and to prepare individuals with lifelong learning skills that will be necessary for the twenty-first century (Frantz & Miller, 1990).

Alternative models must be developed for vocational

education. Secondary schools and junior high schools should be reorganized. Greater importance should be placed on preparing youth for careers. Students need to be given greater opportunities to explore careers and lifelong learning. Increased attention needs to be directed toward at-risk youth in today's schools. Greater emphasis also needs to be placed on individualized learning programs and outcomes-based education models. The unstructured curriculum needs to be explored in greater depth, and new magnet schools developed to provide greater opportunities for students to pursue their educational interests. Vocational education needs to continue as an integral part of the education system at the secondary level; however, greater efforts must be made to develop a closer relationship between secondary education and postsecondary education. Schools must continue to develop better models for interfacing with their communities. Greater partnerships between parents, business and industry and schools must be formed to assure that schools are meeting the needs of everyone who has a vested interest in our country's future (Frantz & Miller, 1990).

Section III

Agricultural Education

Agriculture was first taught formally in the United States in Georgia in 1733. There, colonists were trying to learn native methods of cultivation and identify the crops

and techniques best suited to their new home. In 1734, the Salzburger family established what was probably the first specialized school of agriculture--an orphans' school in Ebenezer, Georgia, where children were taught to farm successfully (Moore, 1987).

In the first half of the nineteenth century, some schools offered instruction in agriculture. But as was true for most practical skills, agriculture was taught principally by parents, who passed along to their children the skills and knowledge they needed to take over the family farm or manage their own farm (National Research Council, 1988).

The passage of the Morrill Act in 1862 set the stage for more formal agricultural education. This act reflected the importance that policy-makers placed on agriculture. It provided for the support and maintenance of state colleges where citizens could be taught agricultural and mechanical arts (Tenney, 1977).

Agricultural education in the nineteenth century differed significantly from other occupational education in content and approach. An emphasis on science characterized most programs. Rural educators viewed instruction in science and nature as a way to make public education relevant to rural life (National Research Council, 1988).

The high school curriculum in many states included agronomy, laboratory and field work, rural engineering, and

farm mechanics (Crosby, 1912). These early programs served two purposes: one related to the out-migration of youth to the cities and the second to the need to provide new skills and learning potential to those children who remained on the farm (Rosenfeld, 1984).

During these years, vocational agriculture began to develop the philosophy and traditions that characterize it today. Agricultural education has always been much broader in scope than the occupational programs designed for business and other industries. In 1909 the U.S. Office of Experiment Stations published a paper on high school agricultural education, which urged that "the standard agricultural courses, whether in ordinary high schools or in special schools, should not be narrowly vocational, but should aim to fit the pupils for life as progressive, broadminded, and intelligent men and women, citizens and homemakers,as well as farmers and horticulturalists (True, 1929).

In 1917, Congress further defined the federal role in agricultural education with the passage of the Smith-Hughes Act, which included specific provisions for agricultural education. The passage of this act marked the point at which "vocational agriculture" diverged from general agricultural education in the schools. The act established a federally funded vocational education program that included very specific provisions for agricultural

education. Not all educators agreed with the shift toward a more vocational approach, and some schools did not adopt the new vocational agriculture programs (National Research Council, 1988).

Typically, curricula covered a wide range of topics. The new vocational agriculture programs were not rural versions of the vocational trade and industrial education programs being established in the cities. Farming was not simply a job, but a way of life. The challenges of farming were as varied as the American landscape. Nor was the farmer an employee who needed education in skills that subsequently would be used under the guidance of management in a structured work environment (National Research Council, 1988).

Agricultural educators strove for three basic goals in their curricula and programs. They tried to be comprehensive in coverage, scientific in method, and practical in impact and focus. One important innovation to achieve this complex union of characteristics was the use of "supervised farming," which agricultural educator Rufus W. Stimson pioneered. Stimson first used this approach when he became director of the Smith Agricultural School in North Hampton, Massachusetts, in 1908 (Moore, 1985).

Another important development was the founding of the Future Farmers of America in 1928. The FFA grew out of boys' and girls' clubs of the early 1900's and soon became

an integral part of high school vocational agriculture for boys. By working closely with business and industry, the FFA provided many rural young people with an opportunity for economic, political, and civic leadership. The FFA also provided parents and other members of the community opportunities for involvement in a variety of educational and recreational activities directly linked to local farming and business activities. The growth in the organization closely matched growth in enrollment in vocational agriculture programs (National Research Council, 1988).

Despite these pressures to become more like industrial education, vocational agriculture, with its own support system in rural communities and the agricultural industry, retained its distinctive identity among federal vocational education programs. Gradually, however, changing attitudes toward vocational education effected it. College became much more accessible and schools' curricula reflected the need to prepare students for advanced education. College-bound and vocational students began following different educational paths. By tracking college-bound and vocational students after graduation, educators learned more about the types of students who pursued the two paths, and the types of jobs the students took after graduation. As a result, the development of science and academic skills came to be equated with college preparation and were de-emphasized in vocational agriculture (Rosenfeld, 1984).

In 1963, Congress enacted a new vocational education law that reshaped vocational agriculture and altered its relationship to other vocational programs (P.L. #88-210). These changes in federal legislation have placed further emphasis on the special needs of women, members of minority groups and handicapped and disadvantaged students. The Carl D. Perkins Act, approved by Congress in 1984, de-emphasized some of the effects of the 1963 law by expanding the measures of success to include "basic employment competencies," instead of employment alone (P.L. #98-524). These competencies include many of the strengths upon which vocational agriculture is based: basic problem-solving skills, entrepreneurial development and attitudes, and practical applications of scientific concepts and experimental methods.

After considerable study, the National Commission on Secondary Vocational Education (1984) made several recommendations concerning the curriculum in vocational education. The commission recommended the gap between "academic" and "vocational" courses must be bridged. The commission also indicated business and industry need to be involved in the development of the curriculum, and the curriculum should be based on occupational analysis.

The passage of the Carl Perkins Act of 1984 was also of concern to agricultural educators. The act emphasized program improvement, innovation and development instead of

maintenance (Case, 1985). The impact of this act on the curriculum in vocational agriculture is unclear. Both the Perkins Act and the educational reform studies were major concerns of the agricultural education profession during the 1980's. Only time will tell insofar as the impact of these events on the curriculum in agricultural education.

Section IV

Michigan Agricultural Education Reform

Due to the significant decline in enrollment in secondary vocational-technical agriculture education programs and the low enrollment in postsecondary agriculture related occupational areas, along with the fact that agriculture is Michigan's second largest industry, the Michigan Council on Vocational Education initiated a study of the Status and Future Direction of Vocational-Technical Agriculture Education in Michigan. The study was to help determine why the downward trend in vocational-technical agriculture programs has been especially significant. There has been a national effort to stimulate the teaching of agricultural concepts in the general classrooms, especially in the elementary classes. Some grassroots efforts in Michigan have been supported by various private and commodity-based organizations as well as by leaders in the Michigan Department of Education, Michigan Department of Agriculture and Michigan State University.

The aforementioned study, the Status and Future

Direction of Vocational-Technical Agriculture Education in Michigan, conducted by Bobbitt and Warmbrod (1987), includes the following summary statements about agricultural education in Michigan:

* Agricultural education in the secondary schools is primarily vocational education in agriculture.
* Agricultural education in secondary schools (vocational agriculture) is a part of the federal-state system of vocational education. Leadership and incentives from the Michigan Department of Education put highest priority for policy and program development, improvement, and revision on proposals and activities that are within current policies governing the federal-state vocational education system.
* During the past 10 years, there has been a steady and substantial decline in the number of secondary schools offering vocational agriculture programs and in the number of high school students enrolled. The extent of the downward trend in enrollment is greater than the decline in high school enrollments in all vocational education programs and total enrollments in public secondary schools in the state.
* Adult education, as a part of the secondary school vocational agriculture program, has to a major extent almost disappeared. Apparently, data are no longer collected about adult education programs conducted as a

part of the vocational agriculture program.

* There is little indication of a high degree of coordination and articulation between secondary vocational agriculture programs offered in local high schools and in area centers.
* Postsecondary agricultural education (less than baccalaureate level) is offered in some community colleges and universities. There does not appear to be formal articulation between these postsecondary programs and secondary school vocational agriculture programs.
* The policy of local autonomy is strong and real in Michigan and will be a significant factor influencing both the development of proposals and the implementation of proposals for change and reform.
* Persons directly concerned about and involved with vocational agriculture (teachers, school administrators, state advisory council members, State Department of Education personnel, and Michigan State University faculty members in agricultural education) see a need for revision and reform and demonstrate eagerness and willingness to propose and implement change.
* There appears to be agreement that there are purposes for instruction in agriculture at the secondary and lower grade levels that are broader than the purposes

of current vocational agriculture programs.

The purposes for offering instruction in and about agriculture in the public schools of Michigan should be redefined to include purposes broader than, and in addition to, the purposes of vocational education in agriculture. In addition to preparation for entrepreneurship and employment in occupations requiring knowledge and skill in agriculture (food, agriculture, and natural resources), purposes for instruction in and about agriculture include (a) understanding and appreciation of the nature and importance of food, agriculture and natural resources in our economy and society (agriculture literacy); (b) knowledge of occupational and professional opportunities in food, agriculture, and natural resources; and (c) preparation for advanced study of food, agriculture, and natural resources in colleges, universities, and other postsecondary institutions. The adoption of purposes that are broader than the purposes of vocational agriculture requires the initiation of non-vocational programs and courses as well as revision of current vocational agriculture programs and courses (Bobbitt & Warmbrod, 1987).

Curriculum revisions for vocational agriculture programs and the development of curriculum for new programs and courses for instruction in and about agriculture should be consistent with and contribute to the goals and objectives stated in Goals 2000: Education for a New

Century (State Board of Education, April 1987). Instruction about agriculture should be integrated into courses, other than vocational agriculture, currently being taught in grades K through 12. "Agriculture in the Classroom" should be expanded to achieve this purpose. Collaboration between the public schools and the 4-H program of the Michigan State University Extension can contribute to the achievement of this purpose (State Board of Education, 1987).

The vocational agriculture curriculum should be revised and updated (a) to reflect the current and anticipated status of the agricultural industry in Michigan; (b) to increase substantially emphasis on non-production aspects of agriculture; (c) to include more emphasis on economics, management, and marketing; (d) to emphasize the science base of agriculture and the application of science and mathematics through instruction in agriculture and (e) to introduce subject matter concerning the international dimension of agriculture (State Board of Education, 1987).

New courses at the secondary school level, both vocational and non-vocational courses, should be developed in agribusiness, agricultural science, college preparatory agriculture, and other appropriate areas. Courses of varying lengths--year, semester, or quarter--should be considered (State Board of Education, 1987).

At the secondary level, vocational and non-vocational courses in agriculture should not be substituted for meeting

graduation requirements in science and mathematics, especially for students who expect to pursue postsecondary and higher education. Vocational and non-vocational courses in agriculture should emphasize the application of science and mathematics. Students completing these courses should be encouraged to complete science and mathematics courses in which all secondary school students enroll (State Board of Education, 1987).

Curriculum development and revision in vocational and non-vocational courses in agriculture should be accompanied by revision in the purposes, programs, and activities of the FFA. A basic question that must be addressed is: Should students enrolled in non-vocational courses in agriculture participate in a student organization as an integral part of the curriculum? The response to that question sets the bounds for the nature and magnitude of the change in FFA programs and activities that must be considered (Bobbitt & Warmbrod, 1987).

Personnel in secondary and postsecondary schools should initiate articulation agreements, particularly for students who enroll in vocational agriculture courses in high school or secondary institution. Instructional programs in agriculture should use extensively modern technology (computers, communications, etc.) in the delivery of instruction. The development of instructional and curriculum materials and personnel development demand high

priority when concerted efforts for reform and redirection are initiated (Bobbitt & Warmbrod, 1987).

In another report entitled, "Partnerships for a Progressive Future," Michigan Department of Education (1988), stated the need to forge a partnership among the federal, state and local interests for the purposes of:

* funding
* guiding
* supplementing

statewide, locally-based agricultural education programs. Agriculture education includes K-12 courses or units of instruction which provide opportunities for students to understand the food and agriculture systems and/or prepare students for careers requiring knowledge and skills in agriculture.

According to the Michigan Department of Education (1988), resources and grants should be provided to local education agencies in support of efforts in the following areas:

* agricultural curriculum development
* agriculture and food system career awareness
* business/education partnerships
* student leadership

In 1982, the Michigan Association of Teachers of Vocational Agriculture (MATVA) Board of Directors appointed a committee to focus on the direction vocational agriculture

should take. Board members agreed they should forge a partnership with Michigan State University (MSU) and the Michigan Department of Education (MDE) to provide leadership and direction for agriculture education. This committee was entitled Agriculture in the Year 2000. The committee held a series of meetings with various groups and the MATVA membership to identify the problems and needs of agriculture education. The committee recommended that a major NEW thrust was needed in the curriculum that was being taught in the secondary schools. The subject matter of instruction needed to be broadened to emphasize the why of agriculture, not only the how. In order to facilitate this idea, a curriculum project was started in the fall of 1988. The project director was charged with the development of an Agriscience and Natural Resources Curriculum.

The Agriscience and Natural Resources Curriculum development project was funded by the Michigan Department of Education. The project was based on a three-year plan. During this time, the following activities were to take place:

* Curriculum Development
* Curriculum Dissemination
* Program Review
* Articulation at two and four institutions
* Public Relations (Promotion)

The new curriculum was designed to use agricultural and

natural resource content and experiences as a context for integrating principles and concepts from many disciplines. For example, the curriculum focuses on utilizing content as a means for: thinking critically; improving basic skills such as reading, writing, and arithmetic; and problem solving (Elliot & O'Connell, 1990). The development process was to include three phases:

* writing of curriculum materials
* curriculum review by secondary teachers
* curriculum review by content experts

During this phase, fifteen guides were to be developed, four in the core area and eleven in the advanced/specialized area:

Core Area

* Natural Resources and Michigan Agriculture
* Plant Science
* Animal Science
* Business Management and Marketing

Advanced/Specialized Area

* Advanced Animal Science
* Small Animal Science
* Equine Science
* Greenhouse
* Landscape Design & Construction
* Floriculture
* Advanced Plant & Soil Science
* Conservation
* Forestry
* Ecology
* Advanced Business Management & Marketing

After two years of curriculum development, Michigan Department of Education discontinued funding. The

Greenhouse, Forestry, Ecology, Conservation and Advanced Business Management & Marketing advanced/specialized areas have yet to be completely developed.

To disseminate the core curriculum, many workshops were conducted. The workshops were designed to explain the use of the curriculum guides to teachers. All agricultural teachers in the state received a copy of the four core curriculum guides.

It was critical that the schools complete the restructuring process to change from vocational agriculture to Agriscience and Natural Resources Education. This process was outlined in the "Standards for Excellence", which was located in the Michigan Agriscience and Natural Resources Curriculum Overview (Elliot & O'Connell, 1990). The "Standards For Excellence" included four phases:

* Preparation
* Review
* Action Plan Development
* Implementation of Action Plan

Teachers attended a six hour inservice workshop on this restructuring. To support the program review process, three individuals were employed, as specialists, by Michigan State University. Funding was provided by a grant from the MDE authorized through state legislation. Their role was to assist teachers in the completion of the "Standards For Excellence" and to work with schools to establish new

programs. The plan called for these specialists to be employed from October 1990 to June 1994, but, due to the tight state budget, their employment was terminated March 31, 1992. School systems were expected to complete the restructuring process by the end of the 1992 - 93 school year in order to continue to receive Department of Education added cost funding.

Section V

Curriculum Reform

Based on the extensive review of educational reform literature, effective curricular reform and the use of evaluation to determine its effectiveness are both factors shown to increase learning (OERI, 1986). For most lay persons, curriculum today is equated with course guides, syllabi, or textbooks that establish the "course." Such a classic definition of the term also reflects the meaning of curriculum for the most conservative or structured educators in the field. The following definitions of curriculum are indicative of how conservative philosophies of education see or "envision" school programming:

> The curriculum should consist entirely of knowledge which comes from the disciplines...Education should be conceived as a guided recapitulation of the process of inquiry which gave rise to the fruitful bodies of organized knowledge comprising the established disciplines (Phenix, 1935, p. 166).
>
> The curriculum should consist of permanent studies - the rules of grammar, reading, rhetoric and logic, and mathematics (for the elementary and secondary school), and the greatest books of the western world (beginning at the secondary level of schooling) (Hutchins, 1936,

p. 82).

> The curriculum must consist essentially of disciplined study in five great areas: (1) command of mother tongue and the systematic study of grammar, literature and writing; (2) mathematics; (3) sciences; (4) history; (5) foreign language (Bestor, 1956, pp. 48 - 49).

Other writers in this century have seen the curriculum as an experience rather than a product of study:

> A sequence of potential experiences is set up in the school for the purpose of disciplining children and youth in group ways of thinking and acting. This set of experiences is referred to as the curriculum (Smith, 1957, p.3).

> The curriculum is now generally considered to be all of the experiences that learners have under the auspices of the school (Doll, 1970).

By the mid-1950's, it became increasingly evident that schools had a tremendous influence on students' lives. Some of those influences were structured; others were due to the congregation of youth. It was recognized that students also had experiences not planned by the school. During this period, definitions were dominated by those aspects of the curriculum that were planned, as opposed to simply the content or general experiences of students.

> The curriculum is all of the learning of students which is planned by and directed by the school to attain its educational goals (Tyler, 1957 p.79).

> A curriculum is a plan for learning (Taba, 1962).

> We define curriculum as a plan for providing sets of learning opportunities to achieve broad goals and related specific objectives for an identifiable population served by a single school center (Saylor, 1974 p. 6).

Finally, beginning in the 1960's and continuing in the

1980s, there has been a concern for the performance of educational programs. This focus, often referred to as "accountability" in schools, has pushed the definition of the curriculum toward an emphasis on ends or outcomes:

> Curriculum is concerned not with what students will do in the learning situation, but with what they learn as a consequence of what they do. Curriculum is concerned with results (Johnson, 1970-71 p.25).
>
> Curriculum is the planned and guided learning experiences and intended outcomes, formulated through systematic reconstruction of knowledge and experience, under the authority of the school, for the learners' continuous and willful growth in personal-social competence (Tanner & Tanner, 1975 p.25).

Changes in the American society since 1980 have contributed significantly to the complexity of curricular concerns in schools. The public has generally become more sophisticated in understanding the value dimensions underlying decisions by educational planners and, with such understanding, has become more active in decision-making in schools. Important decisions affecting the lives of school children were made in the 1980's, and such decisions reflect the problems and issues of our society. Pressures on educational decision-making affect the role of the curriculum developer and present those who plan school programs with the difficult tasks of defining the school's missions (Wiles & Bondi, 1989).

In changing curriculum and pedagogy, the schools also changed many other facets of schooling, including staff composition, hiring practices, scheduling, relationships

with other schools, staff development and funding patterns (Bodilly, 1992). Many schools reported major barriers to new curriculum and pedagogical practices: existing regulations, poor funding, lack of existing materials, and lack of support for teacher efforts.

Another study (Schmidt, 1992), examined various curricular reforms. A selected few include:

* Revising the curriculum to eliminate the general track and develop study plans for all students accordingly.
* Helping academic teachers see the value of combining vocational and academic preparation. They will then be able to emphasize to their students the value of this preparation.
* Surveying area employers to determine the use of technology and basic skills in various work settings; then use survey findings as a basis for changes in both vocational and academic offerings.
* Learning from employers which basic skills are needed on the job and then have vocational and academic teachers work together to develop them in their instruction.
* Restructuring general (basic academic) courses so that they become applied courses - courses that relate learning to the real world, so students can see the validity of what they are learning. Have vocational and academic teachers work together to develop instructional examples for applied offerings.

In addition, according to the Education Commission of the States (ECS) (1992), many state leaders have concluded that schools should no longer be content with sending a minority of students to college and giving the rest "basic skills". Rather, schools' new business is to teach all students a much more challenging core curriculum and help them learn how to use their minds fully-how to think

critically and creatively, solve problems and continue learning for the rest of their lives.

According to ECS, some ways of changing standards include:

* **Create 21st century achievement standards** such as those expressed in the National Council of Teachers of Mathematics "Curriculum and Evaluation Standards for School Mathematics" or the American Association for the Advancement of Science's (AAAS) "Science for All Americans". Both are visionary documents emphasizing the importance of problem solving, inquiry, active learning, observing, predicting, experimenting, modeling and other higher mental processes. They establish expectations that are much higher than any in U.S. history and they can be achieved only through major changes in curriculum, instruction, assessment and management.

* **Develop "common-core" policy documents.** Unlike curriculum frameworks, common-core documents establish broad outcome categories across subject areas and support active learning and critical thinking, not passive memorization.

* **Develop curriculum frameworks and guidelines.** Such documents bring coherence to major subject matter. An example may include that of Michigan ("Michigan Essential Goals and Objectives for Science in Education") (pp. 4 & 5)

Curricular Evaluation

An integral part of developing and maintaining an effective school learning climate is regular and consistent use of evaluation techniques. The efficient use of assessment data is an important tool in making decisions regarding program improvement (Wiles & Bondi, 1989).

Evaluation is used in vocational education to: 1) assess teachers' occupational competency, 2) assess student readiness for particular learning, 3) evaluate student

progress and mastery of learning objectives, and 4) evaluate program effectiveness. As in effective school literature, it is important to plan not only how the data will be collected but also how they will be reported and used for student and program improvement (OERI, 1986).

Daniel Stufflebeam (1986) has developed an outline or evaluation structure that is general to all types of evaluation:

* Focusing of the Evaluation
* Collection of Information
* Organization of Information
* Analysis of Information
* Reporting of Information
* Administration of the Evaluation

Another useful resource for curriculum leaders responsible for designing evaluation systems is a classification outline developed by the Phi Delta Kappa National Study Committee on Evaluation (Wiles & Bondi, 1989). This outline presents the following four types of evaluation commonly found in schools according to their objective, method, and relationship to the decision-making (DM) process:

> **Content Evaluation** - to define the operation context, to identify and assess needs in the context and to identify and delineate problems underlying the needs.
>
> **Input Evaluation** - to identify and assess system capabilities, available input strategies and designs for implementing strategies.

Process Evaluation - to identify or predict, in process, defects in procedural design or its implementation, and to maintain record of procedural events and activities.

Product Evaluation - to relate outcome information to objectives and to context, input, and process information.

Clearly, evaluation follows the same path as the general curriculum cycle (cycle within a cycle) and the role of the curriculum management plan is to structure evaluation in such a manner that it directs the flow of curriculum work (Wiles & Bondi, 1989).

Using such organizers as targeted data, evidence data, standards of excellence, and relevant data, evaluation decisions can help schools and districts measure the kinds of items that help to assess real progress. What curriculum workers really need to know is whether they are on task and accomplishing what is intended.

If the evaluation stage in a Curriculum Management Plan (CMP) can tell the school board and other planners of their status, give general direction to planning and answer the question "Did we do what we wanted to do?" evaluation is a functional part of the curriculum cycle.

Evaluation, the fourth step of the curriculum development cycle, is the critical stage for the 1990's. School leaders are being held accountable for their performance and must be both effective and efficient in their work to develop quality school programs. Historic criteria for curriculum quality, plus sound educational

research, will guide curriculum leaders in their evaluation of school programming (Wiles & Bondi, 1989).

Section VI

Curricular Change

Change in education is becoming more and more commonplace. The numerous changes that are occurring affect the ways schools and school personnel function (Lunenburg & Ornstein, 1991). These changes include, but are by no means limited to, educational restructuring, site-based management, integration of vocational and academic education and Tech Prep. The potential exists for more changes to be initiated in the schools over the next few years than have occurred during the last two decades. Such changes will undoubtedly place greater demands and burdens on the school's entire professional staff, including administrators, teachers, and counselors. Of these staff members, teachers are most likely to be affected by change since they have direct responsibilities for helping students learn.

History and tradition seem to be universal in their impact upon change. Too often, students, faculty members and administrators are trapped in "mental concept prisons" and are uninterested or unwilling to take the risks that sometimes are involved in revising curricula. Woodrow Wilson, when president of Princeton, said that the process of reforming a college curriculum might very well be as

difficult as moving a graveyard (Walters, 1985).

Gee (1986) indicated that conformity to norms is one of the greatest barriers to curricular change. The fact that schools have traditionally been only reactive in educating students for gainful employment is another reason why change is often difficult; there is an inherent risk in educating students for a future that is difficult to predict.

Although not all curricular changes require additional funds, administrators and others often cite financial constraints as a major limitation to large-scale curricular changes. Other reports have cited limited resources as contributing to the status quo (Dinnerstein et. al., 1981; Gaff, 1983).

Academic "territorialism" and interdisciplinary competition often pose problems (Dinnerstein et. al., 1981; Gee, 1986). Accreditation itself can be an obstacle to curricular change; the requirements imposed by the accrediting body may define the boundaries of permitted change. However, Lozier and Covert (1982) indicated that bringing people together and promoting human contact across formal boundaries are necessary for stimulating change. Even if no change actually occurs, the linkages developed between academic units through the process can be beneficial.

The highest degree of specialization of faculty members, who often prefer depth within the discipline to

expanse across disciplines, can lead to resistance to change (Verulapalli, 1984). This can be a test of the philosophical tenets that form the basis of curricular decisions. During the past several decades, agricultural and natural resources curricula have moved to even higher degrees of specialization at the baccalaureate level. There is a great resistance to any effort to reverse this trend and move toward a broader, more general education. This resistance is found not only on college campuses; often it comes from outside the university, from the business community and commodity groups who, while professing their preference for students who can think broadly, solve problems, and articulate their thoughts, still insist that students' "training" be deep enough to allow them to move immediately into the job market (Johnston & Brandenberg, 1987).

Administrators who fear the loss of faculty positions and student credit hours as a result of change greatly resist any efforts to disturb the status quo. Students who wish to be trained rather than educated and employers who seek to hire "trained" students often argue persuasively against change that does not improve vocational capabilities. Most educators seeking change lack both the opportunity to act as Arthur E. Morgan did when he became president of Antioch College in 1921. He hired virtually an entirely new faculty in order to select individuals "who

possessed qualities of personality, scholarship and training that would enable them to contribute immediately" to his plan for curricular change (Newman, 1981).

Human acceptance of ideas is the real carrier of change; human resistance is the real barrier to change. Spicer (1967) has observed that people resist change if the change threatens basic securities; if the change is not understood; and if the change is imposed upon them. In writing about resistance to change, Watson, as cited in Bennis (1969, 1985), identified most of the forces that contribute to individual or social-system stability as key sources of resistance. For the individual, these forces include homeostasis, habit, dependence and self-distrust. For the social system, obvious sources of resistance include conformity to norms, vested interests, and rejection of outsiders.

The revitalization of the agriculture curriculum demands maximum input and extends beyond campus and state borders. A conference of administrators from North Central agricultural colleges stressed the need to make the curriculum more international in outlook (North Central Council of Administrative Heads of Agriculture (CAHA) & Farm Foundation, 1985). Agriculture's future strength depends in part upon the diversification of human resources. No longer can agriculture be exclusively for individuals with experience in vocational agriculture, FFA, 4-H or similar

groups. The agricultural curriculum must attract students with urban and rural backgrounds--students with appropriate academic training in the science, mathematics, humanities and communication.

According to Skilbeck (1990), national level curriculum and pedagogical change cannot be achieved by working on the curriculum and teaching methodologies alone. School organization, teacher education, terms and conditions of service, school workplace relations and school community values impact upon the curriculum and ways of teaching and learning. They all are part of an exceedingly complex picture whose elements are interrelated. Pressures for curriculum and pedagogical change are coming from outside education as well as from within, they are indirect as well as direct and the achievement of change requires, it seems, widespread participation. This, however, is in the form of a power struggle, not a concerted drive (Skilbeck, 1990).

The teacher is generally recognized as a key element in the educational change process. This is primarily because teachers oversee what occurs in their classrooms and laboratories. If teachers embrace an innovation and support its implementation, the potential for success is greatly enhanced. However, as Fullan (1991) indicated, even the most promising innovation may be doomed to failure if teachers do not support its implementation.

For any change to be successful, teachers must become

full partners in the change process. Thus, teachers should not only be knowledgeable about a particular change, they must also understand the ways change can improve instruction and learning. The change process also extends to each teacher's initial and continuing acceptance and support. Because teachers can be excellent facilitators of change, it is important for change "to support rather than detract from their professional roles" (Finch & McGough, 1991, p. 185). This is where relevant professional development activities can contribute to successful change, particularly when teachers are provided with personally rewarding, realistic and practical opportunities to engage in implementing change (Finch & McGough, 1991).

There are several factors that relate to the way that an individual adopts (or does not adopt) an innovation. These factors include individual characteristics, an individual's attitude towards the innovation, and knowledge of the innovation (Rogers, 1971; Russell, 1971).

Mohr (1978) wrote of interactive effects of factors involved with innovation theory. He postulated conceptualizing innovation in terms of these interactions. Two of the most prominent interactive variables are motivation of the user and resources of the user. He states that the most effective way to answer whether an innovation will diffuse quickly is to go through every potential adopter and plug his/her individual characteristics into the

predictive model.

Mohr also breaks the adoption process into two essential elements--awareness of the innovation and the consideration of adoption of the innovation. This process--becoming aware of the innovation and then deciding on its adoption--is known as the "fair trial" for the innovation. He states that any amount of innovation or commitment beyond the fair trial point is no longer innovation. He concludes by stating that innovation is a multiplicative (interactive) function of benefits, costs, resources, and risk.

Darrow and Henderson (1987) identified the human acceptance and innovation as the real carrier of change, and human resistance to these ideas as the real barrier to change. The human acceptance of ideas and of innovations are important factors when considering curriculum adoption. Darrow and Henderson further identified the following factors as important to reducing the resistance to curriculum change and innovation:

1. The teachers must feel that the proposed curriculum change comes from their ideas, rather than one developed by outsiders.

2. The proposed curriculum change has wholehearted support from administration from the top down.

3. The teachers see the change as reducing rather than increasing their present workload.

4. The proposed curriculum is aligned with values and ideals that have long been acknowledged by the faculty.

5. The proposed curriculum offers the kind of new experiences that interest teachers.

6. The teachers feel that their autonomy and security are not threatened.

7. The teachers have been involved in diagnostic efforts leading its members to agree on the basic problem and to feel the problem's importance.

8. The proposed curriculum is adopted by consensus.

9. Proponents of the curricular proposal can empathize with opponents to recognize valid objections and to take steps to relieve unnecessary fears.

10. The implementers recognize that innovations are likely to be misunderstood and misinterpreted, and provision is made for feedback of perceptions about the proposal and for further clarification.

11. The curricular change is kept open to revision and reconsideration if experience shows that changes would be desirable.

Darrow and Henderson further summarized several steps that can lead to curricular innovation. The first is the identification of the need for change. Unless the need for change can be clearly justified and specific problems can be recognized, curricular revision will be delayed. The second step is analyzing the environment in which the curricular change will occur. The third step is identifying principal groups that need to be involved in the development of the curriculum. The final step is to identifying potential barriers to curricular change.

Christiansen and Taylor (1966) summarized that the curriculum implementation process can be made to work most effectively when individual characteristics of teachers, teacher values, and awareness of the development and implementation process are considered by the implementers.

It appears that teacher attitudes, characteristics and knowledge level are important factors in the adoption of a curriculum.

According to Christiansen and Taylor (1966), it is not easy to move from the discussion of reform to the action of implementing curricular changes. Yet, in spite of the obstacles encountered, schools must continue to examine their curricula and make those changes they perceive to be in the best interest of their students.

Section VII

The Concept of Perception

Perception is not so much a reaction to stimuli as it is a serial process in which a person notes and responds to cues to which they have already sensitized, forms hypotheses about the characteristics of the object with which they have confronted and then confirms these expectations by making further observations. Perceiving is never just receiving. There is always discrimination and selection. The manner in which anyone perceives his environment depends upon the meanings that various objects have for them as well as upon what they actually are doing. Perception is not a direct response to stimulation (Sherif & Sherif, 1956).

If a student likes or does not like to learn, for example, they have positive or negative attitudes toward learning (the object). If they have negative attitudes toward learning, he may perceive education as useless.

Thus, they perceive in a certain manner because they hold certain attitudes toward learning.

Early definitions of perceptions, such as that of Helmholtz (cited in Allport, 1955), focused on physical sensory stimulation. Allport broadened the definition by stating that perception involves both sensory awareness and understanding or meaning:

> Perception is dependent to a large extent upon the impressions those objects make upon our senses. It is the way things look to us, or the way they sound, feel, taste, or smell. But perception also involves, to some degree, an understanding, a "meaning" or a "recognition" of these objects (p. 14).

Allport suggested that perception is more complex than just the reception of sensory stimuli. It involves the meaning an individual associates with those sensory messages.

Combs and Snygg (1959) contributed to the description of perception by defining a perceptual field. Instead of focusing on perceptions of objects or events, the authors examined perceptions from a larger perspective. They stated:

> By the perceptual field, we mean the entire universe, including himself, as it is experienced by the individual at the instant of action. It is each individual's personal and unique field of awareness, the field of perception responsible for his every behavior (p.20).

Combs et al. (1976) asserted that these perceptions and personal meanings give direction to people's actions, choices, or behaviors.

> People do not behave according to the facts as others see them. They behave according to the facts as they see them. What governs behavior from this point of view are the person's unique perceptions of himself and the world in which he lives, the meanings things have for him (p. 20).

In essence, behavior is a function, not of an external event, but of the individual's perception of it. All behavior, then, is lawful or purposeful, relevant, and pertinent to the situation only as the individual understands it at the moment.

Combs et al. identified four dimensions of the perceptual field as it relates to a person's perception at a given time:

1. The perceptual field is fluid or constantly changing. This allows the individual to respond to new or changing conditions in the environment.

2. The perceptual field has stability as a result of imposing order and meaning on the environment.

3. The perceptual field has direction. It is always organized and meaningful; perceptions are never masses of meaningless stimuli.

4. The perceptual field has a figure-ground characteristic; that is, at any given time certain aspects of the field are brought into a clear figure or are seen with greater intensity than other aspects of one's field. This is called the process of differentiation.

Hilgard and Atkinson (1967) supported this definition when they wrote:

> Perception is the process of becoming aware of objects, qualities or relations by way of the sense organs. While sensory content is always present in perception, what is perceived is ... the result of complex patterns of stimulation plus past experience and present attitude (p. 632).

Hilgard and Atkinson added to previous definitions of perception the dimensions of past experience and current attitudes. They said that perception is a process of becoming aware--a process that helps the individual incorporate past knowledge or information with current inputs. Thus, perception can be seen as resulting from the complex interaction among incoming information, past experience, and current attitudes. As perceptions form, they become part of past experiences, which come to bear upon and influence the development of future perceptions.

Hilgard and Atkinson's notion of perception was similar to Dewey's views concerning habit and the continuity of experience. Dewey (1935) stated:

> The basic characteristic of habit is that every experience enacted and undergone modifies the one who acts and undergoes, while this modification affects, whether we wish it or not, the quality of subsequent experiences. It covers the formation of attitudes, attitudes that are emotional and intellectual; it covers our basic sensitivities and ways of meeting and responding to all the conditions which we meet in living (p. 35).

Perception is similar to habit in that both concepts affect an individual's attitudes and behaviors, based on how that person perceives and incorporates the experience. Dewey described this relationship as follows: "The principle of continuity of experience means that every experience both takes up something from those which have gone before and modifies in some way the quality of those which come after" (p. 35).

Combs et al. (1976) said that what an individual perceives will, to a great extent, depend on the kinds of opportunities provided to him. Exposure to events in no sense completely determines or guarantees the perceptions a person will have. Even with equivalent exposure to an event, different people's perceptions of that event might not be alike. Exposure to events is only one of the factors involved in determining whether an event will be differentiated. Opportunities to experience are essential to perceiving, but what is perceived is influenced by the unique perceptual field of each person.

Perception, then, involves both internal and external factors and depends on the experiences and attitudes of the individual. Krech, Crutchfield, and Ballachey (1962) supported the notion of the individual nature of perception when they stated:

> There are no "impartial facts." Data do not have a logic of their own that result in the same perceptions and cognitions for all people. Data are perceived and interpreted in terms of the individual perceiver's own needs, own emotions, own personality, own previously formed cognitive patterns (p. 24).

Because facts do not have the same meaning for all people, it is imperative to consider people's perceptions of the facts.

In summary, theorists have expanded the concept of perception throughout the years. Initial definitions of perception emphasized sensory stimuli; later ones incorporated the role of meaning or understanding.

Theorists have concluded that experiences and attitudes, as well as internal and external factors, influence perceptions.

Conceptual Framework

It is important to develop a clear picture of the concept of reform from general education to agriscience education in Michigan. The strength of reform movements is seen more in the curricular area than in any other area.

The reform movement has trickled down from general education to vocational education then to agricultural education. The literature review showed each area has had major impact on curricular reform. That curricular reform will in turn continue to impact reform at the local level.

Curriculum reform in Michigan's agricultural education programs has been focused on restructuring based upon the "Standards For Excellence." Therefore, teachers perceptions of local agriscience reform may be impacted by the "Standards For Excellence", teacher characteristics, school characteristics and other unknown characteristics.

A diagram of the paradigm shift that has occurred from educational reform to the reform in agriscience education is seen in Figure 1. The shift includes a look at more intrinsic values that are the true foundation of vocational education, and more specifically, agriscience education.

Figure 2 represents the cycle curriculum development must go through and its relationship to evaluation. This

study attempted to show how curricular reform in Michigan had evolved and the change that had occurred as perceived by agriscience teachers.

The related literature has provided important information that will guide this research study. Figure 3 shows the operational framework for objectives 1 through 11. This operational framework, based on the "Standards For Excellence" and the review of literature, was developed to provide direction to the study.

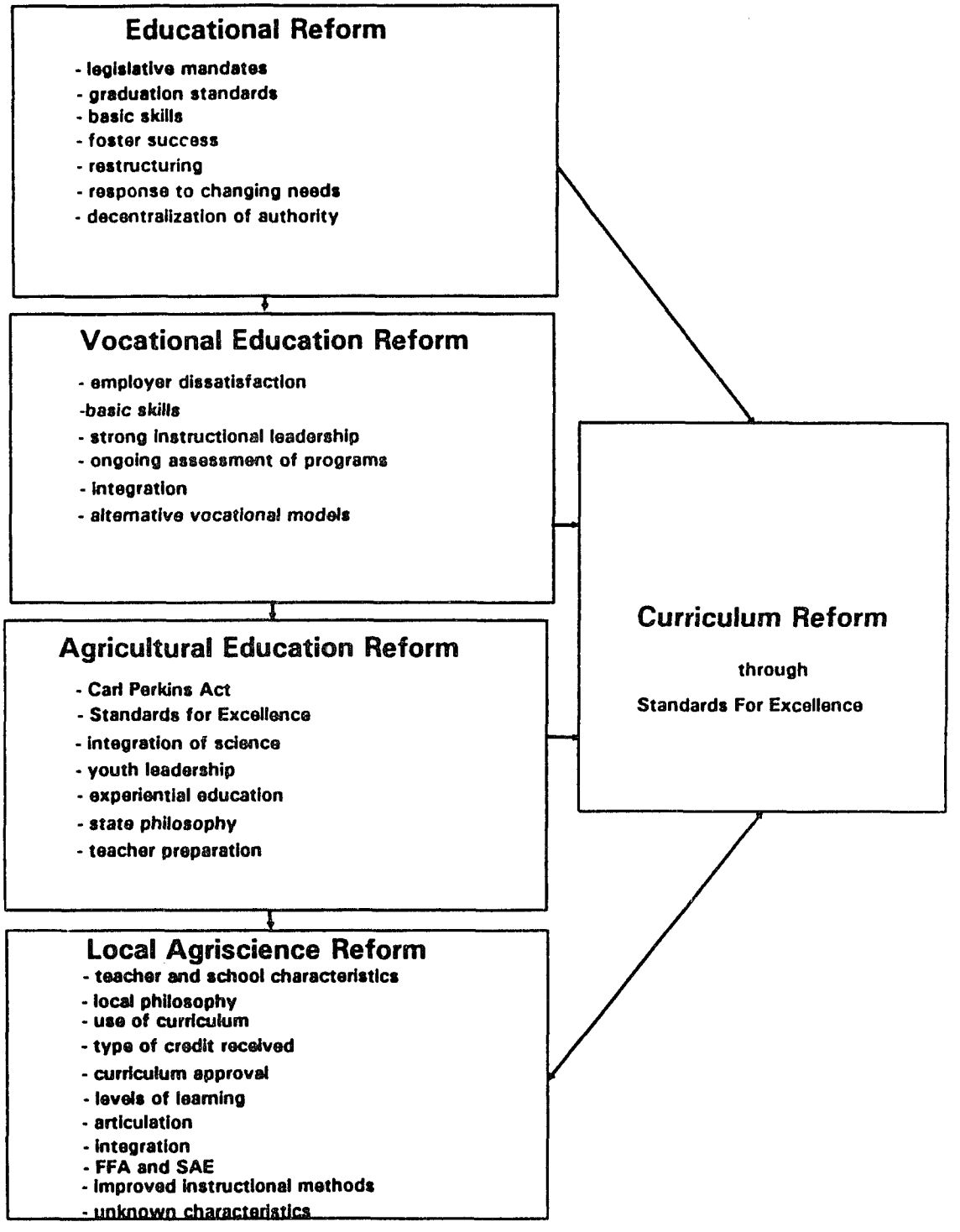

Figure 1. Curricular Reform (Conceptual Framework).

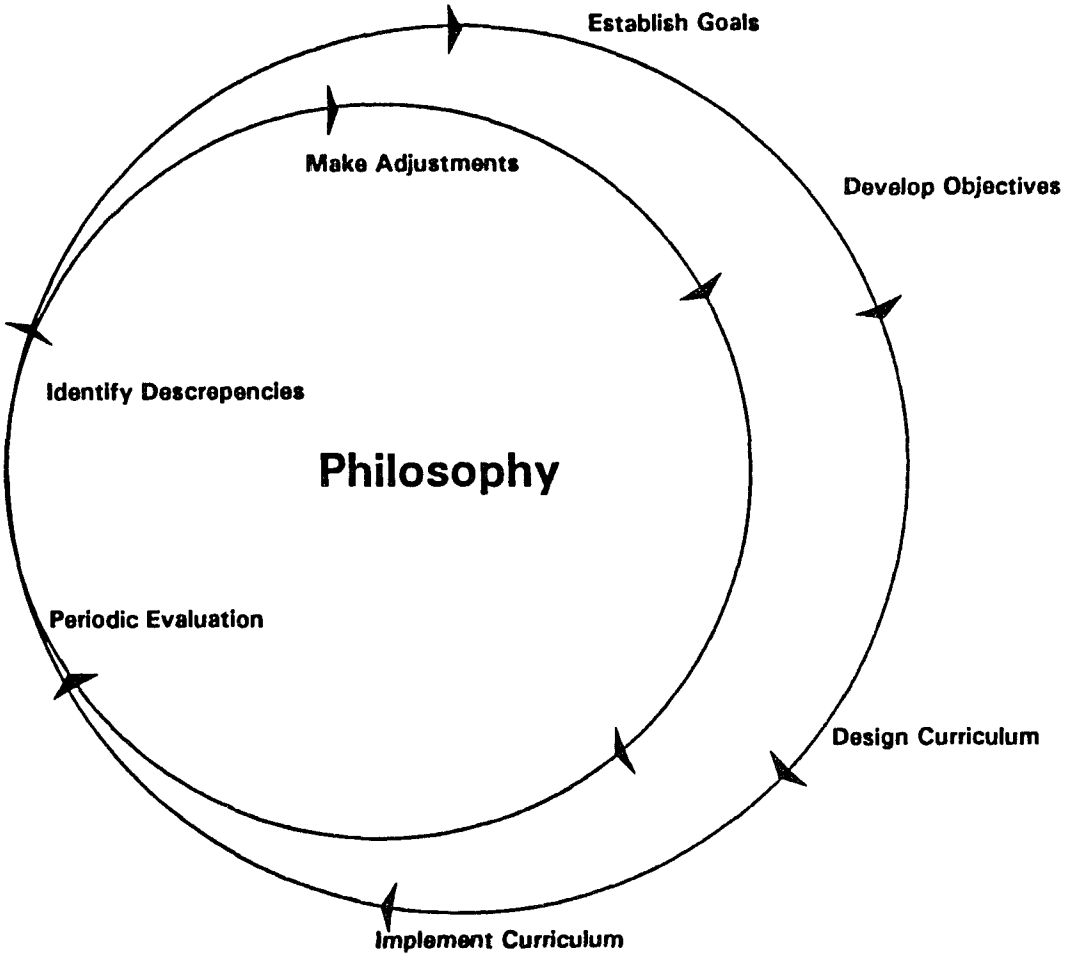

Figure 2. Cycle of Curriculum Development and Evaluation.

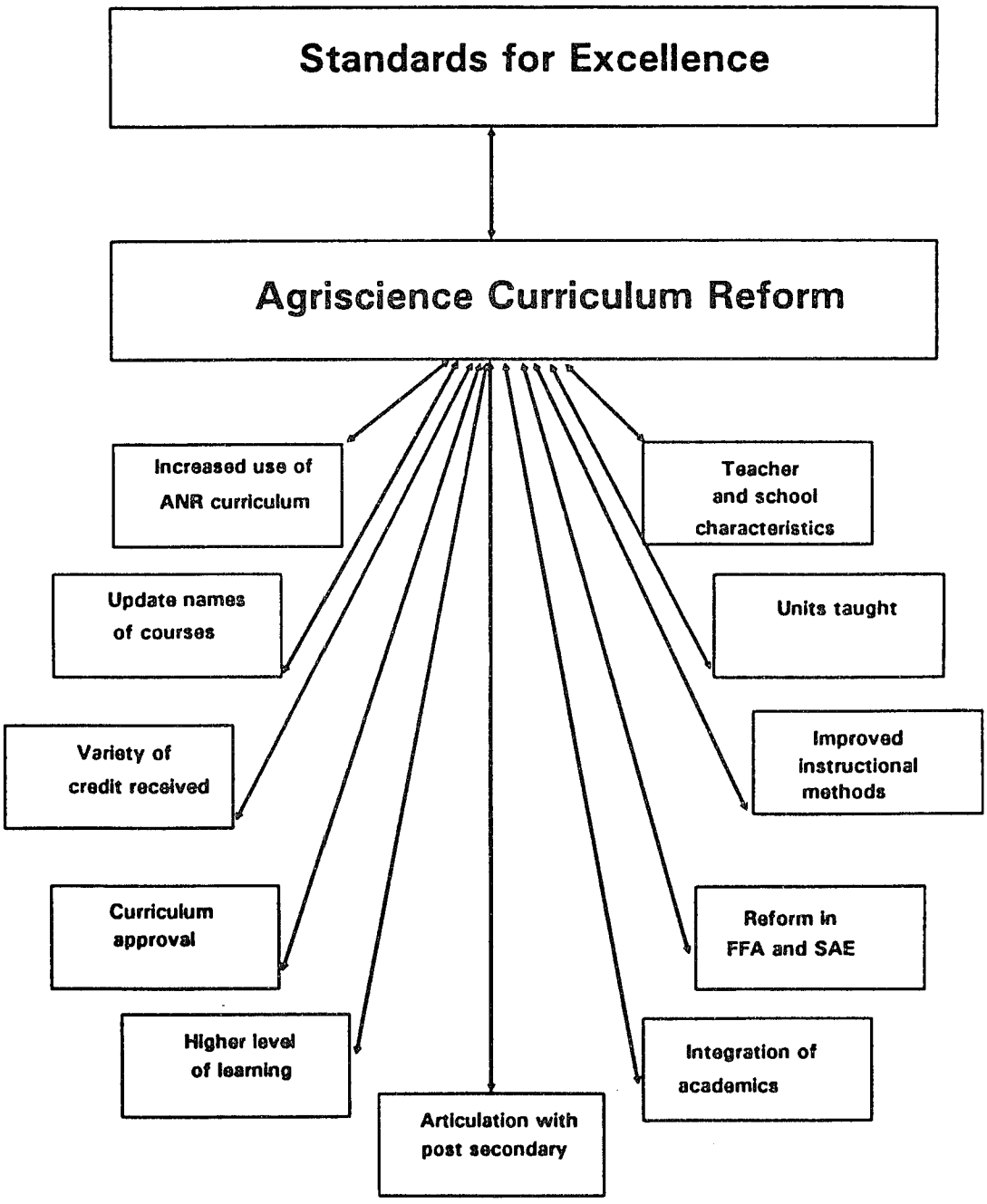

Figure 3. Local Curriculum Reform (Operational Framework).

Conclusion

Recognition that change is constant and that curriculum reform and development have not kept pace with what is needed in the schools has led to a realization that curricular reform and evaluation processes will be required. This is especially true in schools where vocational and academic education integration is being initiated. Teachers will need assistance so they can shift from instructing in an independent fashion to becoming members of the total school enterprise.

Earlier research studies showed the shift from general reform to the need for a more vocational approach. This will give agriscience teachers in Michigan more opportunities to impact students than ever before. The development of new curricula in agriscience and natural resources has placed agricultural education in the position to become a legitimate alternative to traditional agriculture or science programs. Teachers, administrators, parents, students and the community must all be thoroughly involved in the development of the curricular process if it is to be adopted. However, teachers' perceptions about curriculum and its process are also important to the success of Michigan's new curricular reform in agriculture education.

The curricular restructuring process in Michigan required a comprehensive review of the agriscience programs.

The review process included a set of standards that were measurable. The standards were used to determine whether educational goals and objectives were being met. The standards were designed to estimate level of quality, strengths and identify areas that needed improvement. The Michigan "Standards For Excellence" was the restructuring tool that was used as the framework for curricular change. The "Standards For Excellence" was also used as a guide in developing this study. The standards that were reviewed and evaluated involved the agriscience teacher, administration, parents, other teaching faculty, businesses and community members. The partnerships that were developed empowered the community to direct the focus of the local program. Individuals were challenged to develop and implement a program that had long term commitment to fundamental systematic change. In order to have lasting change, individuals directly involved in the curricular process must have a vested interest in its success. Therefore, this study was undertaken to determine if curricular change and adoption actually took place, based upon agriscience teacher's perceptions.

CHAPTER III

METHODOLOGY

Introduction

The methods and procedures used in this study are presented in this chapter. Sections include: Pre-experimental design, overview of the research questions, variables, validity, reliability, population, reducing sampling bias, instrument development, data collection and data analysis.

Pre-Experimental Design

The descriptive survey used a one-shot case study, pre-experimental design. Campbell and Stanley (1963) discussed this design when they stated, "Much research in education today conforms to a design in which a single group is studied only once, subsequent to some agent or treatment presumed to cause change" (p. 6). The design is represented as follows:

X O

The one-shot case study is used as a minimum reference for guiding future research studies. The design does not control threats to internal validity stated by Campbell and

Stanley. However, because descriptive research seeks only to explore phenomena and gain new insights into current events in life, the use of the one-shot case study design was appropriate for this study.

Overview of the Research Questions

Table 1 describes the research questions of the study, the type of tests used, and the questions from the measuring instrument that were used to obtain necessary research data.

Table 1

Research Question, Type of Tests and Related survey Questions

Research Questions	Type of Tests	Related Questions
1.To what extent do Michigan agriscience teachers report using various Michigan Agriscience and Natural Resources Curriculum guides?	Means, Frequencies, Standard Deviations and Regression Analysis	Teacher Survey Question #10
2.Have local secondary agriscience course titles changed due to curriculum restructuring?	Open ended questions	Teacher Survey Question #9

Table 1 (cont'd)

Research Questions	Type of Tests	Related Questions
3.What type of credit are agriscience and natural resources courses receiving before and after restructuring?	Frequencies, Wilcoxon Signed Test	Teacher Survey Question #11
4.To what degree do Michigan agriscience teachers report they are teaching unit and topic areas suggested by the Michigan State Department of Education?	Means, Standard Deviations and T-tests	Teacher Survey Question #17
5.To what degree do Michigan agriscience teachers report using various levels of Bloom's taxonomy when evaluating students both before and after restructuring of the Agriscience and Natural Resources Curriculum?	Means, Standard Deviations and T-tests	Teacher Survey Question #12
6.To what degree do Michigan agriscience teachers report integrating concepts and principles taught in other academic areas both before and after restructuring of the Agriscience and Natural Resources Curriculum?	Means, Standard Deviations and T-tests	Teacher Survey Question #16

Table 1 (cont'd)

Research Questions	Type of Tests	Related Questions
7.To what degree do Michigan agriscience teachers report using varieties of instructional methods used to deliver the Michigan Agriscience and Natural Resources Curriculum both before and after restructuring?	Means, Standard Deviations and T-tests	Teacher Survey Question #13
8.Did various local educational committees approve the Michigan Agriscience and Natural Resources Curriculum both before and after restructuring?	Frequencies, Wilcoxon Signed Test	Teacher Survey Question #14
9.Was the local Agriscience and Natural Resources Curriculum being articulated with post secondary institutions both before and after restructuring?	Frequencies, Wilcoxon Signed Test	Teacher Survey Questions #15
10.What are Michigan agriscience teachers' perceptions of various statements regarding the FFA and SAE before and after restructuring?	Means, Frequencies, Standard Deviations and T-tests	Teacher Survey Questions #18- #34

Table 1 (cont'd)

Research Questions	Type of Tests	Related Questions
11.What is the relationship between the implementation of the Michigan Agriscience and Natural Resources Curriculum and selected demographic characteristics of Michigan agriscience and natural resources teachers?	Means, Frequencies Standard Deviations and Regression Analysis	Teacher Survey Questions # 10,90b,104 - 107, 115-117, 124

Variables

Dependent Variables

The dependent variables for this study were as follows:

Research Question 3:type of credit courses are receiving.

Research Question 4: teaching of unit and topic areas suggested by the Michigan Department of Education.

Research Question 5: levels of Bloom's taxonomy used.

Research Question 6: integration of concepts and principles from other academic areas.

Research Question 7: variety of instructional methods used.

Research Question 8: curriculum approval from various local committees.

Research Question 9: articulation with postsecondary institutions.

Research Question 10: perceptions of various statements regarding FFA and SAE.

Independent Variable

The independent variable for all research questions was the restructuring of the Michigan Agriscience and Natural Resources Curriculum. The two levels of the independent variable were before restructuring and after restructuring.

Extraneous Variables

The extraneous variables to this design included personal characteristics of the subjects and characteristics of the schools that were part of the population. The personal characteristics of the subjects included gender, age, years teaching, years in current position, involvement in development of curriculum, and hours of inservice. School characteristics included the number of restructuring meetings the program held during restructuring. These variables were used only for regression analysis.

Validity

Internal Validity

This one-shot case study design had weaknesses in the areas of history, maturation, selection and mortality. The researcher could not determine the difference between the effect of the Michigan Agriscience and Natural Resources Curriculum and the possible effects from the history or the maturation of the respondents, therefore, leaving a possible threat. By conducting a census of all agriscience and natural resources teachers in Michigan the researcher controlled the threat to selection. Mortality was

controlled for by getting 100 percent of the agriscience and natural resources teachers to respond.

External Validity

Bracht and Glass (1968) identified threats to external validity that were addressed in this study. They placed the threats to external validity into two classes: population and ecological. The comparison of the experimentally accessible population and the target population was the first threat to population validity. This was controlled by conducting a census of all Michigan agriscience and natural resources teachers. Because all agriscience and natural resources teachers were surveyed, the target and experimentally accessible populations were the same.

The interaction of personological variables and the treatment was not a threat in the study because there were no active independent variables. The independent variable was the restructuring of the Michigan Agriscience and Natural Resources Curriculum. The curriculum consisted of four basic core units. All of the agriscience and natural resources teachers were familiar with the curriculum.

Multiple treatment interference was not present in this study because no active treatment was given to the population. The subjects' use of the Michigan Agriscience and Natural Resources Curriculum was the only naturally occurring treatment.

A threat to the study was the Hawthorne effect because

the agriscience and natural resources teachers knew the questionnaire was part of a research study. Responses may have been altered because the questionnaire was distributed from the Department of Agricultural and Extension Education, the same department that developed the Michigan Agriscience and Natural Resources Curriculum. This may have caused the teachers to give the curriculum more positive ratings. This was also the reason why novelty and disruptive effects were threats in this study. The curriculum was newly developed and teachers had only used it three years. Teachers could have responded differently to the survey questions because of the novelty of the new curriculum.

The experimenter effect was considered a threat to this study. The individuals who implemented the questionnaire were the same individuals who organized the curriculum development effort, therefore, teachers could have altered their responses on the questionnaire due to this factor.

Post-test sensitization, interaction of history and treatment effects, measurement of the dependent variable, and interaction of time of measurement and treatment effects were not present in this study because there was no active treatment given to the teachers. The questionnaire only sought the teachers' perceptions about the curriculum.

Face Validity

Face validity of the instrument was established by professionals in the area of agriscience and natural

resources. The questionnaire was edited and changed to reflect suggested improvements.

Content Validity

The instrument was evaluated for content validity by a panel of experts familiar with agriscience and natural resources education. Changes were made to improve clarity and reduce ambiguity in certain questions.

Reliability

Reliability of the instrument was established with a random sample of fourteen Michigan agriscience and natural resources teachers included in the study. Reliability was calculated using Cronbach's Alpha Coefficients in the Statistical Package for the Social Sciences (SPSS/PC+). Reliability coefficients ranged from .733 to .981.

Population

The target population for this study was all Michigan agriscience and natural resources teachers in the school year 1993-94; who completed the restructuring process, and who had more than one year of teaching experience. Because there were only 116 agriscience and natural resource educators in Michigan during 1993-94, who satisfied the target population criteria, a census of all educators was conducted. Therefore the experimentally accessible population, of 116 educators, was also the target population for the survey. All 116 educators returned a completed questionnaire for a 100 percent response rate.

Reducing Sampling Bias

Frame Error

Frame error for this study was controlled by cross-checking the names of Michigan agriscience and natural resources teachers in the directory with agricultural education faculty from the Department of Agricultural and Extension Education at Michigan State University. The list was also checked again with the Agricultural Education Supervisor from the State Department of Education. The purpose of this cross-check was to ensure that individuals on this list had not retired or unintentionally been deleted.

Selection bias

By conducting a census of 116 agriscience and natural resources teachers, selection bias was eliminated from this study. This eliminated the possibility of certain teachers having a better chance than other teachers of receiving a survey.

Non-response error

Non-response error was controlled by following the Total Design Method (Dillman, 1978). A total of three follow-up phone calls and mailings were conducted with replacement questionnaires. No further follow-up was necessary to control for non-response error since all 116 educators responded.

Instrument Development

The survey instrument (Appendix B) and corresponding supplementary pages (Appendix C) used in this study was developed by Randy Showerman and David Krueger by studying other instruments that measure demographic and attitudes toward changes. A written questionnaire, administered to all agriscience teachers, was selected as the measuring instrument. The questionnaire consisted of ten parts. The individual parts are as follows: Part I - Written Philosophy, Part II - Secondary Instructional Program, Part III - Student Services, Part IV - Agriscience and Natural Resource Teacher, Part V - Facilities and Equipment, Part VI - Advisory Committees, Part VII - Finance, Part VIII - School Personnel, Part IX - General Restructuring, and Part X - Personal Data. Each of the above sections correspond directly to those included in the Michigan Agriscience and Natural Resources "Standards for Excellence" (Elliot & O'Connell, 1990)and pertain to the research questions. The researcher only used Part II of the instrument for this study.

Part II included a variety of questions that measured respondents perceptions toward change in the instructional program before and after restructuring. Question 9 asked respondents to indicate the title of courses taught before and after restructuring. Question 10 asked respondents to indicate, by entering the appropriate percentage, to what

extent they perceived using the Agriscience and Natural Resources Curriculum. Question 11 asked respondents to indicate the type of credit the agriscience and natural resources courses received before and after restructuring of their programs. Question 12 measured the respondents perceived use of various verb levels from Bloom's taxonomy. A five-point likert-type scale was used for respondents perceptions both before and after restructuring. On the scale items were coded N - Never = 1, S - Seldom = 2, SO - Sometimes = 3, O - Often = 4, and A - Always = 5. Question 13 used the same five-point likert-type scale as question 12, but measured the respondents perceived use of various instructional methods. Question 14 determined if the curriculum was approved by various committees and groups both before and after restructuring. Questions 15 determined articulation with post-secondary institutions both before and after restructuring. Question 16 used the same five-point scale used in questions 12 and 13. The respondents were asked to what extent they perceived the integration of basic concepts and principles from other disciplines were taught in their programs before and after restructuring. Question 17 asked respondents to indicate to what extent they perceived teaching information within various unit titles. Question 18 through 34 measured respondents perceived agreement to various FFA and SAE statements both before and after restructuring. A before and after six-

point likert-type scale was used. On the scale items were coded FD - Firmly Disagree = 1, D - Disagree = 2, SD - Somewhat Disagree = 3, SA - Somewhat Agree = 4, A - Agree = 5, and FA - Firmly Agree = 6. Questions 23 and 34 ask teachers response to the percentage of students in FFA and with SAE projects both before and after restructuring.

Data Collection

Data were collected by personally administering the questionnaire at an annual teachers conference called Operation Synergism on September 23, 1993. The remainder of the agriscience and natural resource teachers not in attendance at Operation Synergism received the questionnaire by mail. Cover letters (Appendix D) and questionnaires were sent out during the last week in September 1993. A reminder postcard (Appendix E) followed seven days later. After two weeks, a telephone reminder and another questionnaire was mailed to non-respondents. A total of three follow-up phone reminders and mailings with cover letters (Appendix F - H) were sent with replacement questionnaires. All teachers in the target population responded.

Data Analysis

The survey instruments were analyzed using the Statistical Package for the Social Sciences (SPSS/PC+) (SPSS Inc., 1991). The data was analyzed using frequencies, means, and standard deviations. Statistical tests used included t-tests, Wilcoxon signed-ranks test, and multiple

regression. Table 1., at the beginning of this chapter, shows the tests used in the analysis of data by research question. Alpha were set a prior at .05. These statistical tests were used only as a tool to assist in decision making and examining in detail. Because the study was a census these statistical tests were not used as an inferential tool. A post hoc panel of agriscience teachers established the criterion for relevance of change in the mean scores from before to after restructuring. The following descriptions, mean changes and percent changes were established:

Mean Change	Percent Change	Description
.76 and above	.32 and above	very strong change
.51 to .75	.24 to .31	substantial change
.26 to .50	.16 to .23	moderate change
.11 to .25	.08 to .15	low change
.01 to .10	.01 to .07	negligible change

CHAPTER IV

FINDINGS

Research Question 1

Research question one asked to what extent do Michigan agriscience teachers report using various Michigan Agriscience and Natural Resources Curriculum guides. Nine curriculum guides were available for teachers use at the time of the study. They were Natural Resources and Michigan Agriculture (100), Plant Science (200), Animal Science (300), Business Management and Marketing (400), Landscape Design and Construction (AS200C), Advanced Floriculture (AS200D), Advanced Animal Science (AS300A), Equine Science (AS300B), and Small Animal Science (AS300C) (Elliot, et.al, 1989, 1990, 1991). The first four guides, 100, 200, 300 and 400, were considered the basic core curriculum. The remainder of the guides beginning with the prefix "AS" were considered advanced/specialized curriculum guides.

Ninety percent of the agriscience teachers in Michigan indicated they used some portion of the basic guides while 44 percent of the agriscience teachers indicated using some portion of the advanced guides (Table 2).

Table 2

Teachers' use of Basic or Advanced Curriculum Guides

	N	%
Basic	104	89.6
Advanced	51	43.9

When looking at the extent each guide was used agriscience teachers reported using 43.7% of guide 100, 57.9% of guide 200, 59.9% of guide 300 and 43.3% of guide 400 (Table 3).

Table 3

Extent of use of the Agriscience and Natural Resources Curriculum Guides

Guides	N	Mean %	S.D.
100	93	43.74%	27.54
200	101	57.90%	28.07
300	77	59.86%	26.02
400	75	43.26%	27.25
AS 200C	33	34.19%	23.95
AS 200D	30	47.66%	35.45
AS 300A	28	34.07%	29.12
AS 300B	18	32.18%	35.47
AS 300C	20	27.05%	34.24

Research Question 2

Research question two asked if local secondary agriscience course titles changed due to curriculum restructuring. This question was answered by allowing agriscience teachers to indicate the titles used in their school course catalogs or course listings both before and after the restructuring process. The course titles both before and after restructuring were then compared to determine if any change occurred or any trends appear.

Fifty-four unduplicated course titles were reported used before restructuring. Course titles were predominately production oriented with science only being mentioned six times and natural resources mentioned only eight times. (See Appendix I)

After restructuring, 73 unduplicated course titles were reported. The word science was used in the titles 21 times and natural resources 17 times. There was no mention of the titles Ag I, Ag II, Ag III, or Ag IV. Course titles like Basic Bio/Agriscience, Agriscience, Ecology, Agri-Biology and Zoology Animal Science were used. (See Appendix J)

Research Question 3

Research question three asked what type of credit the agriscience and natural resources courses received before and after restructuring. Credit for vocational education declined from 78% to 68% while science credit increased from 46% before restructuring to 73% after restructuring. The

post hoc panel of agriscience teachers considered the decline of vocational credit low change and the increase in science credit substantial change (Table 4).

Table 4

Credit courses received before and after restructuring

	Before		After			
	N	%	N	%	Z	Sig. of Z
General Education	54	47%	55	47%	-.276	.767
Vocational	91	78%	79	68%	-2.269	.007*
Science	53	46%	85	73%	-4.464	.000*
Mathematics	1	1%	3	1%	-.913	.361
Speech	1	1%	2	1%	-1.00	.317
Economics	0	0%	0	0%	.000	1.00
Business	1	1%	4	1%	-1.604	.108

*p < .05

Research Question 4

Research question four asked to what extent the agriscience and natural resource teachers report they were teaching unit and topic areas suggested by the Michigan Department of Education both before and after restructuring. The unit and topic areas were those suggested in the Michigan agriscience and natural resources core objectives. All unit and topic areas showed moderate change or better as determined by the post hoc panel of agriscience teachers (Table 5).

Table 5

Teachers' reported use of unit and topic areas suggested by the Michigan Department of Education

	Before		After			
	Mean	S.D.	Mean	S.D.	T-value	Sig. of T
Ag Credit	2.11	1.09	2.53	1.158	4.07	.000*
Ag Marketing	2.27	1.067	2.79	1.138	5.82	.000*
Animal Health	2.48	1.24	3.04	1.45	4.65	.000*
Animal Anatomy & Production	2.51	1.322	3.156	1.524	5.23	.000*
Animal Products	2.29	1.202	2.76	1.38	4.00	.000*
Animal Genetics	2.39	1.266	3.12	1.52	5.91	.000*
ANR Government	1.85	.961	2.27	1.079	5.44	.000*
Basic Botany	2.87	1.28	3.69	1.14	7.39	.000*
Bus. Structure	2.24	1.03	2.80	1.151	5.96	.000*
Career /Pl Sci.	2.72	1.20	3.29	1.20	5.73	.000*
Communications	2.52	1.16	2.9	1.138	5.69	.000*
Computers	2.22	1.092	2.75	1.242	5.22	.000*
Domestic Animal	2.32	1.255	2.69	1.384	3.32	.001*
Economics ANR	2.28	1.078	3.0	1.212	6.69	.000*
Env. System	2.24	1.064	3.13	1.049	9.33	.000*
Financial Mgmt	2.28	1.173	2.78	1.15	5.60	.000*
Impact of Soci.	2.06	1.04	2.79	1.271	6.35	.000*
Land Measure	2.44	1.247	2.76	1.263	2.93	.004*
Livestock Sel.	2.33	1.315	2.57	1.307	2.13	.036*
Nutri. & Feed	2.44	1.30	2.93	1.40	4.26	.000*
Pest Science	2.64	1.243	3.28	1.281	5.67	.000*
Plant Nutrition	2.93	1.278	3.57	1.131	6.07	.000*
Soil & Pl Stru.	2.90	1.304	3.62	1.162	6.51	.000*

*p< .05

Research Question 5

Research question five asked to what degree agriscience teachers reported using various levels of Bloom's taxonomy when evaluating students both before and after restructuring. Moderate change was shown as mean scores were higher after restructuring in comprehension, application, analysis, synthesis and evaluation indicators. Only knowledge indicators showed negligible change as determined by the post hoc panel of agriscience teachers (Table 6).

Table 6

Teacher reported use of Bloom's indicators as an evaluating tool

	Before		After			
	Mean	S.D.	Mean	S.D.	T-value	Sign. of T
Knowledge	3.79	.653	3.8	.67	.14	.886
Comprehension	3.8	.66	4.11	.567	5.82	.000*
Application	3.68	.714	4.01	.788	6.13	.000*
Analysis	3.15	.818	3.47	.767	6.67	.000*
Synthesis	3.40	.722	3.73	.612	7.05	.000*
Evaluation	3.10	.836	3.46	.752	6.42	.000*

*$p < .05$

Research Question 6

Research question six asked to what degree Michigan agriscience teachers reported themselves integrating concepts and principles taught in other academic areas both

before and after restructuring. Very strong change was shown in science and low change in fine arts. All other areas showed moderate change as determined by the post hoc panel of agriscience teachers (Table 7).

Table 7

Teachers' reported integration of concepts and principles taught in other academic areas

	Before		After			
	Mean	S.D.	Mean	S.D.	T-value	Sign. of T
Business	3.3	.916	3.70	.745	5.05	.000*
Communication	3.37	.939	3.79	.795	6.01	.000*
Economics	2.99	.835	3.39	.863	5.52	.000*
English	2.91	.986	3.31	.92	6.00	.000*
Fine Arts	2.3	1.05	2.43	1.06	2.31	.023*
Health	2.66	.941	2.98	.952	4.59	.000*
Mathematics	3.44	.914	3.77	.839	4.73	.000*
Reading	3.33	.857	3.69	.816	5.60	.000*
Science	3.69	.826	4.44	.658	9.6	.000*
Social Sci.	2.68	.836	3.02	.946	5.21	.000*

*$p < .05$

Research Question 7

Research question seven asked to what extent Michigan agriscience teachers reported using varieties of instructional methods used to deliver the Agriscience and Natural Resources Curriculum both before and after restructuring. Only field trips and question and answer

techniques showed negligible change in mean score after restructuring. The use of lectures showed moderate negative change. SAE, interactive telecommunications, industry publications and audio visuals showed low change. Experiments, lab work and research showed substantial change while all other methods showed a moderate change as determined by the post hoc panel of agriscience teachers (Table 8).

Table 8

Teachers' reported use of instructional methods during the educational process

	Before		After			
	Mean	S.D.	Mean	S.D.	T-value	Sign. of T
Audio Visuals	3.68	.777	3.81	.72	2.31	.023*
Case Study	2.42	.884	2.76	.90	4.96	.000*
Comp. software	2.79	1.0	3.20	1.0	4.3	.000*
Demonstrations	3.66	.831	4.02	.639	5.95	.000*
Experiments	3.20	.892	3.94	.682	9.6	.000*
Field Trips	3.22	1.04	3.31	1.01	1.26	.209
Indiv. Instr.	3.37	.978	3.68	.845	4.9	.000*
Industry Publications	3.28	.904	3.50	.896	3.80	.000*
Interactive Telecomm.	1.77	.928	1.94	1.06	2.61	.011*
Lab work	3.39	.973	3.94	.736	8.0	.000*
Leadership Activities	3.61	.998	3.87	.892	3.25	.002*
Lectures	3.60	.739	3.28	.766	-4.05	.000*
Problem Solving	3.54	.846	3.88	.751	4.96	.000*
Question & Answer	3.77	.649	3.73	.709	-.63	.530
Research	2.69	.884	3.23	.924	7.41	.000*
Role Play	2.55	.961	2.84	1.03	4.53	.000*
Student Presentations	3.06	.806	3.54	.825	6.37	.000*
SAE	3.23	1.118	3.38	1.126	1.70	.092
Writing	3.37	.872	3.68	.827	4.48	.000*

*$p < .05$

Research Question 8

Research question eight asked if various local educational committees approved the agriscience curriculum both before and after restructuring. Very strong change occurred within the science committee, low change occurred within administration and moderate change occurred within the agriscience advisory committee as determined by the post hoc panel of agriscience teachers (Table 9). The "other" category was approval from Restructuring Committee and FFA Alumni.

Table 9

Approval of the local agriscience curriculum by various local educational groups or committees

	Before		After			
	N	%	N	%	Z	Sig. of Z
Vocational Committee	54	47%	59	51%	-1.121	.2622
Curriculum Committee	47	41%	55	47%	-1.811	.0702
Science Committee	27	23%	65	56%	-3.778	.0002*
Administration	86	74%	99	85%	-2.637	.0084*
School Board	59	51%	64	55%	-1.590	.1118
Agriscience Advisory Committee	82	71%	104	90%	-3.772	.0002*
Other	1	1%	3	8%	.0000	1.000

* P < .05

Research Question 9

Research question nine asked if the local Agriscience and Natural Resources Curriculum was being articulated with

post secondary institutions both before and after restructuring. Substantial change occurred with articulation at Michigan State University as determined by the post hoc panel of agriscience teachers. Thirty-four percent of the teachers indicated some form of articulation after restructuring compared to 8 percent before restructuring (Table 10).

Table 10

Curriculum officially articulated with other postsecondary programs

	Before		After			
	N	%	N	%	Z	Sig. of Z
Michigan State University	9	8.8%	37	36.3%	-4.623	.0000*
Community College	4	3.9%	12	11.8%	-1.467	.1424

*P < .05

Research Question 10

Research question ten asked for agriscience teachers' perceptions of various statements regarding FFA and SAE before and after restructuring. Agriscience teachers reported a moderate overall change in their perception of various FFA statements as indicated by the mean moving from 4.17 before restructuring to a mean of 4.45 after restructuring (Table 11). Only the statement that asked if the local FFA chapter was providing scheduled class time in which members participated in chapter activities, was there

low change in the mean score as determined by the post hoc panel of agriscience teachers. All other statements about FFA and their mean scores can be seen in Appendix K.

Table 11

Teachers' perceptions of various statements regarding FFA

Before		After			
Mean	S.D.	Mean	S.D.	T-value	Sig. of T
4.17	1.59	4.45	1.34	3.13	.002*

* $p < .05$

Teachers were also asked what percentage of their students were involved in FFA both before and after restructuring. As Table 12 indicates, negligible change was evident.

Table 12

Percent of students involved in the FFA

Before		After			
Mean	S.D.	Mean	S.D.	T-value	sig. of T
64%	40.44	66%	32.61	.18	.861

Agriscience teachers reported a moderate overall change in their perception of various SAE statements as indicated by the mean moving from 3.82 before restructuring to a mean of 4.11 after restructuring (Table 13). Only in the statements that asked if SAE programs included activities such as Ag Production/Ownership and Agribusiness placement, were there low changes in the mean score. All other

statements about SAE and their mean scores can be seen in Appendix L.

Table 13

Teachers' perceptions of various statements regarding SAE

Before		After			
Mean	S.D.	Mean	S.D.	T-value	Sig. of T
3.82	1.466	4.11	1.396	2.88	.005*

* p < at .05

Teachers were also asked what percentage of their students were involved in SAE programs both before and after restructuring. Negligible change was evident (Table 14).

Table 14

Percent of students with an SAE project

Before		After			
Mean	S.D.	Mean	S.D.	T-value	Sig. of T
64%	35.13	68%	32.31	1.14	.258

Research Question 11

Research question eleven asked if there was a relationship between the implementation of the Michigan Agriscience and Natural Resources Curriculum and selected demographic characteristics of Michigan agriscience and natural resources teachers. Eight demographic questions were selected from the survey instrument based on information gathered from the literature review and focus group meetings held in the Department of Agricultural and

Extension Education at Michigan State University. These demographic variables were analyzed and used in a multiple regression analysis to determine if relationships existed between the independent demographic variables and the dependent variables, extent of curriculum guides used and whether or not the curriculum had a positive impact on the local agriscience programs.

Twenty-six percent of the agriscience teachers in the population of this study indicated they were female. Seventy-four percent of the teachers reported they were male (Table 15).

Table 15

Gender

	N	%
Male	86	74.1
Female	30	25.9

The mean reported age of the agriscience teachers was 40.72 years. The minimum was 23 years and maximum 65 (Table 16).

Table 16

Age of a respondent

	Mean	S.D.	Minimum	Maximum
Age of Respondents	40.72	9.24	23	65

The teachers reported teaching a mean of 15.5 years. The minimum was 1 year and the maximum was 37 years (Table

17).

Table 17

Years of teaching agriculture

	Mean	S.D.	Minimum	Maximum
Years of Teaching	15.5	9.25	1	37

In their current teaching position, the agriscience teachers reported staying a mean of 13.36 years. A minimum of 1 year and maximum of 36 was reported (Table 18).

Table 18

Number of years in current teaching position

	Mean	S.D.	Minimum	Maximum
Years in current position	13.36	9.04	1	36

Teacher were asked if they were involved in the development and/or writing of the Michigan Agriscience and Natural Resources Core Curriculum. Fifty-two percent reported they were involved in either the development or writing of the curriculum (Table 19).

Table 19

Teachers involvement in the development and / or writing of the Michigan Agriscience and Natural Resources Core Curriculum

	N	%
Involvement in development & writing teams	60	52%

Teachers also reported their involvement on the "Standards For Excellence" Committee. Over 11% indicated some involvement on this committee (Table 20).

Table 20

Teachers involvement on the "Standards For Excellence" Committee

	N	%
Involvement in "Standards For Excellence"	13	11%

Teachers reported the number of clock hours of inservice or shadowing they completed over the last three years. The mean hours reported was 75.82 (Table 21)

Table 21

Clock Hours of Inservice completed over the last three years

	Mean	S.D.
Clock Hours of Inservice	75.82	48.49

Teachers reported on the number of formal restructuring meetings their school held. Twenty-six percent reported

holding three formal restructuring meetings followed by 24 percent holding four meetings and 20 percent holding two meetings (Table 22).

Table 22

Formal committee meetings held during restructuring process

Number of Committee Meetings held	Frequency	Percent
1	8	7%
2	23	20%
3	30	26%
4	28	24%
5	14	12%
6 or more	13	11%

Teachers reported on whether the curriculum had made a positive difference on their local ag ed program. The mean was 4.27, which was slightly agree on the six point likert scale (Table 23).

Table 23

The Agriscience and Natural Resources Curriculum has made a positive difference in the local agricultural education program

Mean	S.D.
4.27	1.211

Multiple Regression Analysis

A multiple regression analysis was conducted on the variables related to research questions one and eleven. The multiple regression analysis was conducted to determine if relationships existed between the eight independent demographic variables and the dependent variable, extent of the basic curriculum guides used. The regression analysis found that less than 25% of the variance was explained by the independent variables. The age of the respondent had a negative substantial relationship and was significant at .05. The years teaching had a positive strong relationship (Table 24).

Table 24

Multiple Regression of the extent of the basic curriculum guides used

Independent Variables	Beta (β)	T-value
Intercept		3.29
Formal Committee meetings	.184	1.401
Involved in development / writing	.058	.404
Age of respondent	-.617	-2.642*
Clock hours of inservice	-.104	-.763
Gender	-.148	-1.036
Serve on "Standards of Excellence"	-.005	-.043
Years in current position	-.298	-1.841
Years teaching	.854	1.841

* $p < .05$

$R^2 = .23$

A multiple regression analysis was also conducted to determine if relationships existed between the eight independent demographic variables and the dependent variable extent of the advanced curriculum guides used. The regression analysis found that 30% of the variance was explained by the independent variables. The total years of teaching had a positive strong relationship and the years in their current teaching position had a negative substantial relationship. None of the independent variables were significant at .05 (Table 25).

Table 25

Multiple regression of the extent of advanced curriculum guides used

Independent Variables	Beta (β)	T-value
Intercept		1.547
Formal Committee meetings	.268	1.304
Years teaching	.704	.947
Involved in development / writing	.431	1.560
Serve on "Standards For Excellence"	-.235	-.987
Clock hours of inservice	.023	.093
Gender	-.179	-.750
Age of respondents	-.514	-1.445
Years in current position	-.644	-1.004

R^2 = .30

The final multiple regression analysis was conducted to determine if relationships existed between the eight independent demographic variables and the dependent

variable. The dependent variable was whether the curriculum guides had a positive impact on the local agriscience program. The regression analysis found that 21% of the variance was explained by the independent variables. The clock hours of inservice was significant and showed low negative relationship. Formal committee meetings held was significant and had low positive relationship. Years teaching in current position showed moderate positive relationship and was significant. Years teaching was also significant and showed substantial negative relationship (Table 26).

Table 26

Multiple regression on whether the curriculum guides had a positive impact on the local agriscience programs

Independent Variables	Beta (β)	T-value
Intercept		5.06
Formal Committee meetings	.230	2.07*
Gender	-.154	-1.32
Clock hours of inservice	-.215	-1.97*
Serve on "Standards For Excellence"	-.203	-1.73
Years in current teaching position	.440	1.95*
Involved in development / writing	-.193	-1.65
Age of respondent	.109	.566
Years teaching	-.671	-2.39*

* $p < .05$

$R^2 = .21$

Comments

Michigan agriscience and natural resources teachers were given space on the questionnaire to provide written comments about the curriculum and restructuring process. A sample of the comments is shown below. Comments were categorized into positive, negative, and general comments. A complete listing of all comments from respondents is located in Appendix M.

Positive Comments

"The technical hours have been very beneficial. It helps get teachers released."

"I felt it was important to review our program."

"I hope that MSU will continue to move toward agriscience and that they will support us."

"Any time an administrator is forced into reviewing a program is a wonderful opportunity for teacher to obtain improvements and to show off their successes."

"Time well spent."

Negative Comments

"I find the curriculum very hard to use and ineffective."

"Restructuring didn't really change us a lot. We have clustered and FFA has helped."

"The major concern is how anyone can incorporate all the core curriculum into a program and still cover needed information required of the given programs. Much of the curriculum for the core programs are covered in other classes in our school. There seems to be an overlapping of materials. Are we going to teach science and biology and not what makes many of our programs unique? It seems that a lot of the core curriculum should be already covered in other science classes in our schools or are we going to try to teach these fields and ours also?"

General Comments

"The process of creating the curriculum is far more valuable and important than the curriculums themselves."

"The curriculum is fine, but it is still 'Do What You Want - Don't Make Waves - No One Validates'. The standards are not really there."

"We are actively working on integrating agriscience with other areas in hope of having it become part of a core program."

"We need continued inservice. One day would be better than the two days in September. We need one in the fall and one in late winter. We need to continue to have teachers sharing with teachers on 'things that worked for me'."

"Don't give up on articulation!!"

"We need college credit for advanced courses."

CHAPTER V

CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

Based upon the findings presented in this study the following conclusions, recommendations and implications were formed.

Research Question I

To what extent do Michigan agriscience teachers report using various Michigan Agriscience and Natural Resource Curriculum guides?

Conclusion

- Ninety percent of the agriscience teachers have used approximately fifty percent of the basic curriculum guides while only forty percent of the agriscience teachers have used approximately thirty-five percent of the advanced/specialized curriculum.

Recommendation

- The existing curriculum guides, which are not being used extensively, need to be reviewed and fine tuned. Special inservice workshops should also be conducted to enhance their effectiveness.

Implications

- If the agriscience teachers are expected to use more of the Agriscience and Natural Resources Curriculum guides teachers should be introduced to the curriculum early in their career.
- More inservice workshops will be necessary if agriscience teachers are expected to use more of the basic and advanced curriculum guides.

Research Question 2

Have local secondary agriscience course titles changed due to curriculum restructuring?

Conclusions

- Agriscience teachers used science and natural resources more in their course titles after restructuring.
- The number of course titles increased by nearly fifty percent after restructuring.
- There was no further mention of titles like Ag I, Ag II, Ag III and Ag IV after restructuring.

Recommendations

- Course titles should be standardized if agriscience and natural resources courses are to be accepted for science credit and for advanced placement at post secondary institutions.
- Continued inservice workshops should focus on helping agriscience teachers move from production oriented

course titles to those more oriented to agriscience.

Implications

- By changing course titles to reflect the move to agriscience, local agriscience programs will be recognized by administrators and other science teachers as a valid science option.
- The opportunity for articulation with post secondary institutions in the agricultural sciences will be greatly enhanced as course titles reflect the move to agriscience.
- By changing course titles, agriscience as a whole will be viewed as a more scholarly discipline.

Research Question 3

What type of credit (vocational, science, business, etc.) are agriscience and natural courses receiving before and after restructuring?

Conclusions

- Students from agriscience classes are now receiving less credit counting toward vocational education.
- Students from agriscience classes are now receiving more credits counting toward science education.

Recommendations

- The agriscience teachers should involve themselves more closely with science teachers and school administrators in local school districts to examine and adopt

additional advanced agriscience curriculum and course offerings.

- Efforts should be mobilized which would result in increasing the amount of agriscience credits being recognized at post secondary institutions for admissions purposes.

Implications

- As students from agriscience programs continue to receive more science credit, stronger partnerships with science programs, local school districts and post secondary institutions must be forged.
- Science credit can help strengthen agriscience programs by attracting more students and by giving agriscience programs more respect and recognition.

Research Question 4

To what degree do the Michigan agriscience teachers report they are teaching unit and topic areas suggested by the Michigan Department of Education?

Conclusion

- After restructuring, agriscience teachers reported moderate change in the fact that more of every unit and topic area suggested by the Michigan Department of Education was being used.

Recommendation

- Additional efforts are necessary in terms of inservice workshops to assist teachers in moving toward more substantial change in covering more unit and topic areas.

Implication

- Impacting students on increased science topics will enhance future career opportunities and broaden the knowledge base in the agricultural sciences.

Research Question 5

To what degree do Michigan agriscience teachers report using various levels of Bloom's taxonomy both before and after restructuring of the Michigan Agriscience and Natural Resource Curriculum?

Conclusion

- After restructuring, moderate change was apparent as agriscience teachers reported using higher levels of Bloom's indicators when evaluating students.

Recommendations

- Inservice workshops should be held to assist teachers to incorporate higher levels of learning.
- Teaching at a higher level of learning can be accomplished by adapting more of the Agriscience and Natural Resources Curriculum.

Implication

- The Michigan Agriscience and Natural Resources Curriculum was designed not only as a context for integrating principles and concepts from many disciplines but also focusing on developing process abilities to think critically, make decisions, improve basic skills, and solve problems. The curriculum objectives also contain the affective, cognitive, and psychomotor domains of learning. This curriculum model may be used as a model to enhance other disciplines with similar objectives.

Research Question 6

To what degree do Michigan agriscience teachers report integrating concepts and principles taught in other academic areas both before and after restructuring of the Michigan Agriscience and Natural Resource Curriculum?

Conclusions

- Agriscience teachers reported integrating more concepts and principles taught in other academic areas after restructuring.
- Very strong change toward integration of science concepts and principles were reported by agriscience teachers.

Recommendations

- Agriscience teachers should continue to integrate more science concepts into their curriculum to further enhance the opportunity for science credit.
- The agriscience teachers should involve themselves more closely with science teachers and school administrators in local school districts to examine and adopt additional advanced agriscience curriculum and course offerings.

Implication

- The integration of other academic principles and concepts is enhanced when using the Agriscience and Natural Resources Curriculum.

Research Question 7

To what degree do Michigan agriscience teachers report using varieties of instructional methods used to deliver the Michigan Agriscience and Natural Resources Curriculum both before and after restructuring?

Conclusions

- Agriscience teachers reported using less lecturing after restructuring.
- Substantial change was reported as teachers used more experiments, lab work and research methods.

Recommendations

- Inservice workshops should focus on the promotion of more scientific teaching techniques.
- Undergraduate teacher preparation programs should focus on more scientific teaching techniques when preparing teachers.

Implication

- The implementation of the Agriscience and Natural Resources Curriculum has allowed teachers to use a greater variety of instructional methods. The new curriculum helps promote experiential and interactive learning. These attributes can be used by agriscience teachers to assist other science teachers to improve their programs.

Research Question 8

Did various local educational committees approve the Michigan Agriscience and Natural Resources Curriculum both before and after restructuring?

Conclusion

- After restructuring, agriscience teachers indicated their curriculum was approved more by their administrators showing low change, advisory committee showing moderate change and science committee showing very strong change.

Recommendations

- Agriscience teachers who have reported successful interaction with science teachers should be used as facilitators to assist other agriscience teachers accomplish the same task.
- Agriscience teachers should continue to help promote greater involvement with administration, advisory committees and other educational committees.

Implication

- Since the Agriscience and Natural Resources Curriculum is being approved more by science committees and administrators, a broader variety of credit (science, math, business, etc.) may be achieved.

Research Question 9

Was the local Agriscience and Natural Resources Curriculum being articulated with post secondary institutions both before and after restructuring?

Conclusion

- Agriscience teachers reported more official articulation with Michigan State University after restructuring.

Recommendation

- Agriscience teachers should continue to work closely with their administrators and Michigan State University to standardize their course titles and work more toward

articulation with all post secondary institutions.

Implication

- Restructuring to agriscience programs and implementing the Agriscience and Natural Resources Curriculum will enhance opportunity to articulate with Michigan State University and other post secondary institutions. One obvious benefit to post secondary institutions includes improved recruitment.

Research Question 10

What are agriscience teachers' perceptions of various statements regarding the FFA and SAE before and after restructuring?

Conclusions

- Agriscience teachers perceived a positive overall change in their FFA program after restructuring.
- Agriscience teachers reported no increase with student involvement in FFA due to restructuring.
- Agriscience teachers perceived a positive overall change with SAE after restructuring.
- Agriscience teachers reported no increase in students with an SAE project due to restructuring.

Recommendation

- The agriscience teachers and their administration should view FFA and SAE as an integral component of the curriculum for purposes of enhancing students'

leadership and experiential activities. FFA and SAE should be open to all students in a program, not just those who are members.

Implication

- By demonstrating the integral nature of FFA and SAE, other science teachers can see how student activities and events can help strengthen experiential learning opportunities for students.

Research Question 11

What is the relationship between the implementation of the Michigan Agriscience and Natural Resources Curriculum and selected demographic characteristics of Michigan agriscience teachers?

Conclusions

- The more formal committee meetings held during restructuring increased the teachers' perceptions that the curriculum had a positive impact on their local program.
- The more inservice workshops conducted increased the teachers' perceptions that the curriculum had a positive impact on their local program.
- The longer the agriscience teachers stayed in their current teaching position, the more likely they reported the curriculum had a positive impact on their local program.

- The more years teaching experience the less teachers perceived the curriculum had a positive impact on their local program.
- The agriscience teachers with more teaching experience reported using less of the basic curriculum guides.

Recommendations

- Special inservice workshops should be designed for more experienced teachers.
- Additional inservice workshops on the use of curriculum for all teachers will be necessary if teachers are expected to fully adopt the new curriculum.

Implication

- All teachers need to be encouraged to integrate the new curriculum into their agriscience programs if expectations of articulation are to be accomplished.

Recommendations For Further Research

Listed below are three recommendations arising directly or indirectly from this study, that suggest future research in this area.

1. Conduct a longitudinal study to determine the impact restructuring had on the teachers of this study five years from now.

2. Conduct a qualitative research study, interviewing teachers, students, administrators and community

members to determine the impact restructuring had on the agriscience program, school and community.

3. Conduct a pretest - posttest study of student teachers preparing to teach agriscience to determine the impact of the Agriculture and Natural Resources curriculum. Replicate the study with the same individuals after their first year and after five years of teaching.

4. Conduct a study of change and adoption by other groups of teachers. This change process could be compared to other change processes used by other educators and organizations.

APPENDICES

APPENDIX A

UNIVERSITY COMMITTEE FOR RESEARCH INVOLVING HUMAN SUBJECTS

MICHIGAN STATE
UNIVERSITY

September 14, 1993

TO: Randy Showerman
Dave Krueger
410 Agriculture Hall

RE: IRB #: 93-430
TITLE: AN INVESTIGATION OF THE AGRISCIENCE AND NATURAL RESOURCES EDUCATION CURRICULUM AND THE RESTRUCTURING PROCESS
REVISION REQUESTED: N/A
CATEGORY: 1-C
APPROVAL DATE: September 13, 1993

The University Committee on Research Involving Human Subjects' (UCRIHS) review of this project is complete. I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and methods to obtain informed consent are appropriate. Therefore, the UCRIHS approved this project including any revision listed above.

Renewal: UCRIHS approval is valid for one calendar year, beginning with the approval date shown above. Investigators planning to continue a project beyond one year must use the enclosed form to seek updated certification. There is a maximum of four such expedited renewals possible. Investigators wishing to continue a project beyond that time need to submit it again for complete review.

Revisions: UCRIHS must review any changes in procedures involving human subjects, prior to initiation of the change. If this is done at the time of renewal, please use the enclosed form. To revise an approved protocol at any other time during the year, send your written request to the UCRIHS Chair, requesting revised approval and referencing the project's IRB # and title. Include in your request a description of the change and any revised instruments, consent forms or advertisements that are applicable. the year, please outline the proposed revisions in a letter to the Committee.

Problems/ Changes: Should either of the following arise during the course of the work, investigators must notify UCRIHS promptly: (1) problems (unexpected side effects, complaints, etc) involving human subjects or (2) changes in the research environment or new information indicating greater risk to the human subjects than existed when the protocol was previously reviewed and approved.

If we can be of any future help, please do not hesitate to contact us at (517) 355-2180 or FAX (517) 336-1171.

Sincerely,

David E. Wright, Ph.D.
UCRIHS Chair

DEW:pjm

cc: Dr. Carroll H. Wamhoff

OFFICE OF
RESEARCH
AND
GRADUATE
STUDIES

University Committee on Research Involving Human Subjects (UCRIHS)
Michigan State University
225 Administration Building
East Lansing, Michigan
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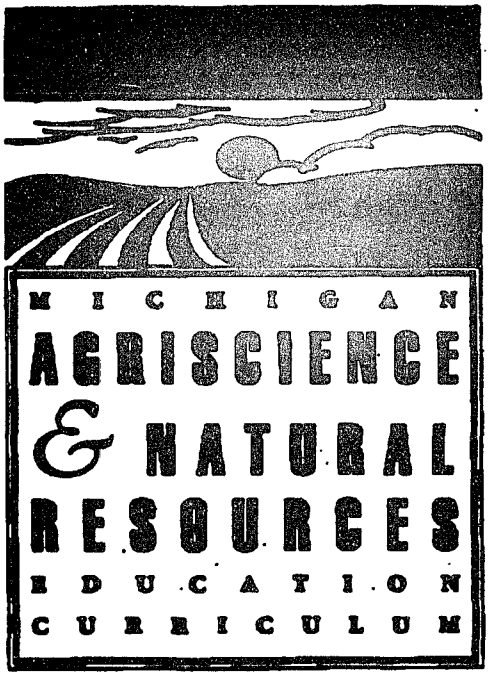
APPENDIX B

SURVEY INSTRUMENT

An Investigation of the Agriscience and Natural Resources Education Curriculum and the Restructuring Process



Michigan State University
Agricultural & Extension Education

An Investigation of the Agriscience and Natural Resources Curriculum and Restructuring Process

BACKGROUND:

Over the past three years agricultural education in the state of Michigan has gone through dramatic reform. Extensive time and effort has been devoted to the development of the Michigan Agriscience and Natural Resources Education curriculum. This reform has been made possible through efforts of local agriscience instructors, business and industry, MSU, MDE and others.

PURPOSE:

By carefully and honestly filling out this questionnaire, you will be providing valuable information that will assist in the future direction of the Michigan Agriscience and Natural Resources Education curriculum and program reform. It is critical that the information provided is factual. Your confidential response by no means will have a negative effect. The information being gathered will be used to improve future program development.

DIRECTIONS:

Answer each question as accurately as you can. Many questions can be answered by circling the item that best describes your opinion or situation. A few questions will require a written response. If you do not understand a question please ask Randy Showerman or Dave Krueger for assistance. All answers will be kept completely confidential.

Example 1:

Please indicate the extent to which you agree or disagree with each of the following statements.

If you Firmly Disagree, circle 1
If you Disagree, circle 2
If you Slightly Disagree, circle 3
If you Slightly Agree, circle 4
If you Agree, circle 5
If you Firmly Agree, circle 6

FD	D	SD	SA	A	FA	
1	2	3	4	5	6	I enjoy teaching agriscience. (The respondent agrees with the statement.)

Example 2:

Please indicate to what extent you use/or used the following verbs during the educational process.

If you Never used circle 1
If you Seldom used circle 2
If you Sometimes used circle 3
If you Often used, circle 4
If you Always used, circle 5

Before Restructuring						After Restructuring				
N	S	SO	O	A		N	S	SO	O	A
1	2	3	4	5	Debate	1	2	3	4	5
1	2	3	4	5	Identify	1	2	3	4	5

Have you gone through the "Restructuring Process" ?
(Check one)
____ Yes ____ No

(If you have not gone through the Restructuring Process please respond only to portions of the questions related to "Before Restructuring").

Part I - Written Philosophy

1. **Does your district have a written philosophy statement for the agriscience and natural resources program?**
   (Check one)
   ____ Yes ____ No

If "NO" skip to question #9.

What are your preceptions of various statements in relationship to philosophy? Please indicate your level of agreement with the following comments.

(FD = Firmly Disagree; D = Disagree; SD = Slightly Disagree; SA = Slightly Agree; A = Agree; FA = Firmly Agree)

FD	D	SD	SA	A	FA		
1	2	3	4	5	6	2.	The Agriscience and Natural Resources Education program Philosophy statement is consistent with the district's/LEA's philosophy statement.
1	2	3	4	5	6	3.	The Agriscience and Natural Resources Education Program Philosophy statement is consistent with the Michigan Agriscience and Natural Resources Education Philosophy Statement.
1	2	3	4	5	6	4.	The Standards for Excellence encouraged the review committee to update the existing philosophy statement.
1	2	3	4	5	6	5.	The new philosophy statement was used in developing program goals.
1	2	3	4	5	6	6.	The new philosophy statement was used in designing program content.
1	2	3	4	5	6	7.	The new philosophy statement was used in implementing the program.
1	2	3	4	5	6	8.	The new philosophy statement was used in evaluating the program.

Part II - Changes in Secondary Instructional Program

9. Please indicate what course titles were used in your schools course catalog or course listing before and after restructuring and if you are utilizing the basic and/or advanced curriculum guides after restructuring.

First Semester

Course Titles Before Restructuring Course	Course Titles After Restructuring Course	Basic	Advanced
_____	_____	☐	☐
_____	_____	☐	☐
_____	_____	☐	☐
_____	_____	☐	☐
_____	_____	☐	☐
_____	_____	☐	☐
_____	_____	☐	☐
_____	_____	☐	☐
Non-Ag: (List) _____	Non-Ag: (List) _____		
_____	_____		
_____	_____		

Second Semester

Course Titles Before Restructuring Course	Course Titles After Restructuring Course	Basic	Advanced
_____	_____	☐	☐
_____	_____	☐	☐
_____	_____	☐	☐
_____	_____	☐	☐
_____	_____	☐	☐
_____	_____	☐	☐
_____	_____	☐	☐
_____	_____	☐	☐
Non-Ag: (List) _____	Non-Ag: (List) _____		
_____	_____		
_____	_____		

10. When teaching to what extent do you perceive using the following Agriscience and Natural Resources Curriculum Guides? (Enter the appropriate percentage.)

Natural Resources and Michigan Agriculture (100)	____%
Plant Science (200)	____%
Animal Science (300)	____%
Business Management and Marketing (400)	____%
Landscape Design and Construction (AS200C)	____%
Advance Floriculture (AS200D)	____%
Advance Animal Science (AS300A)	____%
Equine (AS300B)	____%
Small Animal Science (AS300C)	____%

11. Please indicate what type of credit your courses receive before and after restructuring. (Check all that apply)

Before Restructuring		After Restructuring
____	General Education	____
____	Vocational Education	____
____	Science	____
____	Mathematics	____
____	Speech	____
____	Economics	____
____	Business	____
____	Other _____	____
____	_____	____

12. In your classroom instruction when evaluating students please indicate to what extent you perceive you used/use the following verbs from Bloom's Taxonomy:
(N = Never; S = Seldom; SO = Sometimes; O = Often; A = Always)

Before Restructuring						After Restructuring				
N	S	SO	O	A		N	S	SO	O	A
1	2	3	4	5	..... Apply	1	2	3	4	5
1	2	3	4	5	..... Appraise	1	2	3	4	5
1	2	3	4	5	..... Collect	1	2	3	4	5
1	2	3	4	5	..... Define	1	2	3	4	5
1	2	3	4	5	..... Demonstrate	1	2	3	4	5
1	2	3	4	5	..... Describe	1	2	3	4	5
1	2	3	4	5	..... Design	1	2	3	4	5
1	2	3	4	5	..... Evaluate	1	2	3	4	5
1	2	3	4	5	..... Examine	1	2	3	4	5
1	2	3	4	5	..... Explain	1	2	3	4	5
1	2	3	4	5	..... List	1	2	3	4	5

13. Please indicate to what extent you perceive you used/use the following instructional methods during the educational process.
(N = Never; S = Seldom; SO = Sometimes; O = Often; A = Always)

Before Restructuring						After Restructuring				
N	S	SO	O	A		N	S	SO	O	A
1	2	3	4	5	Audio Visuals	1	2	3	4	5
1	2	3	4	5	Case Study	1	2	3	4	5
1	2	3	4	5	Computer Software	1	2	3	4	5
1	2	3	4	5	Demonstrations	1	2	3	4	5
1	2	3	4	5	Experiments	1	2	3	4	5
1	2	3	4	5	Field Trips	1	2	3	4	5
1	2	3	4	5	Individual Instruction	1	2	3	4	5
1	2	3	4	5	Industry Publications	1	2	3	4	5
1	2	3	4	5	Interactive Telecommunications	1	2	3	4	5
1	2	3	4	5	Laboratory Work	1	2	3	4	5
1	2	3	4	5	Leadership Activities	1	2	3	4	5
1	2	3	4	5	Lectures	1	2	3	4	5
1	2	3	4	5	Problem Solving	1	2	3	4	5
1	2	3	4	5	Question and Answer	1	2	3	4	5
1	2	3	4	5	Research	1	2	3	4	5
1	2	3	4	5	Role Play	1	2	3	4	5
1	2	3	4	5	Student Presentations	1	2	3	4	5
1	2	3	4	5	Supervised Agricultural Experiences	1	2	3	4	5
1	2	3	4	5	Writing	1	2	3	4	5

14. Please indicate if your curriculum was approved by the following groups before and after restructuring. (Check all that apply)

Before Restructuring		After Restructuring
____	Vocational Committee	____
____	Curriculum Committee	____
____	Science Committee	____
____	Administration	____
____	School Board	____
____	Agriscience Advisory Committee	____
____	Other (Please specify) _____	____

15. Was your curriculum officially articulated with other postsecondary programs before and after Restructuring: (Check all that apply)

Before Restructuring		After Restructuring
____	MSU	____
____	Community Colleges	____

16. Please indicate to what extent you perceive you were/are integrating concepts and principles taught in:
(N = Never; S = Seldom; SO = Sometimes; O = Often; A = Always)

Before Restructuring						After Restructuring				
N	S	SO	O	A		N	S	SO	O	A
1	2	3	4	5	Business	1	2	3	4	5
1	2	3	4	5	Communications	1	2	3	4	5
1	2	3	4	5	Economics	1	2	3	4	5
1	2	3	4	5	English	1	2	3	4	5
1	2	3	4	5	Fine Arts	1	2	3	4	5
1	2	3	4	5	Health	1	2	3	4	5
1	2	3	4	5	Mathematics	1	2	3	4	5
1	2	3	4	5	Reading	1	2	3	4	5
1	2	3	4	5	Science	1	2	3	4	5
1	2	3	4	5	Social Sciences	1	2	3	4	5
1	2	3	4	5	Other ((Please Specify) _____	1	2	3	4	5

17. Please indicate to what extent you perceive you were/are using information suggested from the Michigan Department of Education.
(N = Never; S = Seldom; SO = Sometimes; O = Often; A = Always)

Before Restructuring						After Restructuring				
N	S	SO	O	A		N	S	SO	O	A
1	2	3	4	5	Agricultural Credit	1	2	3	4	5
1	2	3	4	5	Agricultural Marketing	1	2	3	4	5
1	2	3	4	5	Animal Health	1	2	3	4	5
1	2	3	4	5	Animal Anatomy and Physiology	1	2	3	4	5
1	2	3	4	5	Animal Products	1	2	3	4	5
1	2	3	4	5	Animal Genetics and Breeding	1	2	3	4	5
1	2	3	4	5	ANR Government	1	2	3	4	5
1	2	3	4	5	Basic Botany	1	2	3	4	5
1	2	3	4	5	Business Structures	1	2	3	4	5
1	2	3	4	5	Careers in Plant Science	1	2	3	4	5
1	2	3	4	5	Communications	1	2	3	4	5
1	2	3	4	5	Computers	1	2	3	4	5
1	2	3	4	5	Domestic Animals and Products	1	2	3	4	5
1	2	3	4	5	Economics & Natural Resource in Ag	1	2	3	4	5
1	2	3	4	5	Environmental Systems	1	2	3	4	5
1	2	3	4	5	Financial Management	1	2	3	4	5
1	2	3	4	5	Impact of Society on ANR & Animal Welfare	1	2	3	4	5
1	2	3	4	5	Land Measurement	1	2	3	4	5
1	2	3	4	5	Livestock Selection and Evaluation	1	2	3	4	5
1	2	3	4	5	Nutrition and Feed	1	2	3	4	5
1	2	3	4	5	Pest Science	1	2	3	4	5
1	2	3	4	5	Plant Nutrition	1	2	3	4	5
1	2	3	4	5	Soil and Plant Structure	1	2	3	4	5

What are your perceptions of various statements in relationships to the FFA and SAE before and after restructuring? Please indicidate your level of agreement.
(FD = Firmly Disagree; D = Disagree; SD = Slightly Disagree; SA = Slightly Agree; A = Agree; FA = Firmly Agree)

Before Restructuring								After Restructuring					
FD	D	SD	SA	A	FA			FD	D	SD	SA	A	FA
							FFA						
1	2	3	4	5	6	18.	The local FFA chapter is an integral and intracurricular part of the instructional program.	1	2	3	4	5	6
1	2	3	4	5	6	19.	The local FFA chapter has a written Program of Activities that is an integral to the Agriscience and Natural Resources curriculum.	1	2	3	4	5	6
1	2	3	4	5	6	20.	The local FFA chapter is provided scheduled class time in which members participate in chapter activities.	1	2	3	4	5	6
1	2	3	4	5	6	21.	The local FFA chapter has a process to record individual student participation in FFA activities.	1	2	3	4	5	6
1	2	3	4	5	6	22.	The local FFA chapter conducts monthly chapter meetings.	1	2	3	4	5	6
						23.	What percent of the students in your Agriculture program were/are involved in the FFA. ____% Before Restructuring ____% After Restructuring						
							SAE						
1	2	3	4	5	6	24.	All students are encouraged to have an SAE program.	1	2	3	4	5	6
1	2	3	4	5	6	25.	SAE programs to engage students in activities that are related to their career objectives.	1	2	3	4	5	6
1	2	3	4	5	6	26.	SAE programs to engage students in activities that are related to the instructional program.	1	2	3	4	5	6
1	2	3	4	5	6	27.	SAE programs count toward credits for graduation.	1	2	3	4	5	6
							SAE programs includes activities such as:						
1	2	3	4	5	6	28	Research	1	2	3	4	5	6
1	2	3	4	5	6	29	Collections	1	2	3	4	5	6
1	2	3	4	5	6	30.	ANR Communications	1	2	3	4	5	6
1	2	3	4	5	6	31.	Mentoring/Shadowing	1	2	3	4	5	6
1	2	3	4	5	6	32.	Ag Production Ownership	1	2	3	4	5	6
1	2	3	4	5	6	33.	Ag Business Placement	1	2	3	4	5	6
						34.	What percent of the students in your Agriculture program had/has an SAE project. ____% Before Restructuring ____% After Restructuring						

Part III - Affect on Student Services

What are your perceptions of various statements in relationships to the effect on student services before and after restructuring? Please indicate your level of agreement.

Before Restructuring								After Restructuring					
FD	D	SD	SA	A	FA			FD	D	SD	SA	A	FA
1	2	3	4	5	6	35.	Guidance personnel in the local school district provide students with information regarding the agriscience and natural resource program.	1	2	3	4	5	6
1	2	3	4	5	6	36.	Guidance personnel in the local school district encourage students to enroll in Agriscience and Natural Resources Education programs.	1	2	3	4	5	6
1	2	3	4	5	6	37.	Guidance personnel in the local school district inform students that the Agriscience and Natural Resources Education curriculum will meet other graduation requirements such as science.	1	2	3	4	5	6
1	2	3	4	5	6	38.	Guidance personnel in the local school district advise students about the opportunities in the Agriscience and Natural Resources Education industry.	1	2	3	4	5	6
1	2	3	4	5	6	39.	A variety of agriscience and natural resources opportunities are provided for students to explore.	1	2	3	4	5	6
1	2	3	4	5	6	40.	Enrollment policies are flexible to permit easy entry and exit from the Agriscience and Natural Resources Education program.	1	2	3	4	5	6
1	2	3	4	5	6	41.	The curriculum addresses the requirements of special needs students.	1	2	3	4	5	6
1	2	3	4	5	6	42.	The curriculum is relevant to all populations.	1	2	3	4	5	6

Part IV - Support and Assistance for the Agriscience and Natural Resources Teacher

What are your perceptions of various statements in relationship to the support and assistance for the Agriculture and Natural Resources teacher before and after restructuring? Please indiciate your level of agreement.
(FD = Firmly Disagree; D = Disagree; SD = Slightly Disagree; SA = Slightly Agree; A = Agree; FA = Firmly Agree)

Before Restructuring								After Restructuring					
FD	D	SD	SA	A	FA			FD	D	SD	SA	A	FA
1	2	3	4	5	6	43.	I attend courses, workshops, and convention related activities that provide technical inservice in the area of Agriscience and Natural Resources Education.	1	2	3	4	5	6
1	2	3	4	5	6	44.	I receive support from the school administrations.	1	2	3	4	5	6
1	2	3	4	5	6	45.	I use a comprehensive list of community resources.	1	2	3	4	5	6
1	2	3	4	5	6	46.	I utilize the local Agriscience and Natural Resources Education Advisory committee.	1	2	3	4	5	6
1	2	3	4	5	6	47.	I promote the Agriscience and Natural Resources Education program to community members.	1	2	3	4	5	6
1	2	3	4	5	6	48.	I participate in regional meetings for Agriscience and Natural Resources Education teachers.	1	2	3	4	5	6
1	2	3	4	5	6	49.	I participate in the state teacher associations for Agriscience and Natural Resources Education teachers.	1	2	3	4	5	6
1	2	3	4	5	6	50.	I actively seek new knowledge and ideas by reading professional publications.	1	2	3	4	5	6

Part V - Improvement to Facilities/Equipment

What are your perceptions of various statements in relationship to improvement to facilities and equipment before and after restructuring? Please indicate your level of agreement.

Before Restructuring								After Restructuring					
FD	D	SD	SA	A	FA			FD	D	SD	SA	A	FA
1	2	3	4	5	6	51.	Storage space is provided for equipment, instructional materials and supplies.	1	2	3	4	5	6
1	2	3	4	5	6	52.	An Agricultural library is available for student use.	1	2	3	4	5	6
1	2	3	4	5	6	53.	The Agriculture program receives the total amount of added cost funds generated based on student enrollment.	1	2	3	4	5	6
1	2	3	4	5	6	54.	Instructional materials are available for a variety of learning experiences.	1	2	3	4	5	6
1	2	3	4	5	6	55.	Current resource materials are used.	1	2	3	4	5	6
1	2	3	4	5	6	56.	Current textbooks are used.	1	2	3	4	5	6
1	2	3	4	5	6	57.	Equipment in the department compliments the course offerings.	1	2	3	4	5	6
1	2	3	4	5	6	58.	Supplies in the department compliments the course offering.	1	2	3	4	5	6
1	2	3	4	5	6	59.	A library is maintained and kept current.	1	2	3	4	5	6

The Land Laboratory Includes:

Before Restructuring				After Restructuring	
___ Yes	___ No	60	Animal Facilities	___ Yes	___ No
___ Yes	___ No	61.	Greenhouse	___ Yes	___ No
___ Yes	___ No	62.	Nursery	___ Yes	___ No
___ Yes	___ No	63.	Floral Shop	___ Yes	___ No
___ Yes	___ No	64.	Natural Resources Area	___ Yes	___ No
___ Yes	___ No	65.	Cropland	___ Yes	___ No

Part VI - Changes in Advisory Committee

What are your perceptions of various statements in relationship to changes in the advisory committee before and after restructuring? Please indicate your level of agreement.
(FD = Firmly Disagree; D = Disagree; SD = Slightly Disagree; SA = Slightly Agree; A = Agree; FA = Firmly Agree)

Before Restructuring								After Restructuring					
FD	D	SD	SA	A	FA			FD	D	SD	SA	A	FA
1	2	3	4	5	6	66.	The local advisory committee includes representatives from agribusiness.	1	2	3	4	5	6
1	2	3	4	5	6	67.	The local advisory committee includes representatives from production agriculture.	1	2	3	4	5	6
1	2	3	4	5	6	68.	The local advisory committee includes representatives from high the school teaching staff.	1	2	3	4	5	6
1	2	3	4	5	6	69.	The local advisory committee includes former students.	1	2	3	4	5	6
1	2	3	4	5	6	70.	The local advisory committee includes parents.	1	2	3	4	5	6
1	2	3	4	5	6	71.	Advisory members are appointed for staggered terms.	1	2	3	4	5	6
1	2	3	4	5	6	72.	The advisory committee meets a minimum of 3 times per year.	1	2	3	4	5	6
1	2	3	4	5	6	73.	The advisory committee operates within the framework of written policies and bylaws.	1	2	3	4	5	6
1	2	3	4	5	6	74.	The advisory committee reviews the Agriscience and Natural Resources Education program.	1	2	3	4	5	6
1	2	3	4	5	6	75.	The advisory committee makes recommendations to improve the Agriscience and Natural Resources Education program.	1	2	3	4	5	6
1	2	3	4	5	6	76.	The advisory committee actively supports the Agriscience and Natural Resources Education program.	1	2	3	4	5	6

Part VII - Funding Availability

What are your perceptions of various statements in relationship to funding availability and school personnel support before and after restructuring? Please indicate your level of agreement.

Before Restructuring								After Restructuring					
FD	D	SD	SA	A	FA			FD	D	SD	SA	A	FA
1	2	3	4	5	6	77.	Funds are provided for upgrading program facilities.	1	2	3	4	5	6
1	2	3	4	5	6	78.	Funds are provided for upgrading program equipment.	1	2	3	4	5	6
1	2	3	4	5	6	79.	Funds are provided for upgrading instructional materials.	1	2	3	4	5	6
1	2	3	4	5	6	80.	Funds are provided for an extended contract for the Agriscience and Natural Resources Education teacher.	1	2	3	4	5	6
1	2	3	4	5	6	81.	Funds are provided for FFA activities.	1	2	3	4	5	6
1	2	3	4	5	6	82.	Funds are provided for professional activities for the Agriscience and Natural Resources Education teacher.	1	2	3	4	5	6

Part VIII - School Personnel Support

Before Restructuring								After Restructuring					
FD	D	SD	SA	A	FA			FD	D	SD	SA	A	FA
1	2	3	4	5	6	83.	The high school teaching staff support the Agriscience and Natural Resources Education program.	1	2	3	4	5	6
1	2	3	4	5	6	84.	Administration recognize the FFA as an integral part of the instructional program.	1	2	3	4	5	6
1	2	3	4	5	6	85.	The high school teaching staff recognize the FFA as an integral part of the instructional program.	1	2	3	4	5	6
1	2	3	4	5	6	86.	Administrators actively attend FFA activities.	1	2	3	4	5	6
1	2	3	4	5	6	87.	Other teachers encourage enrollment in the Agriscience and Natural Resources Education program.	1	2	3	4	5	6
1	2	3	4	5	6	88.	Administrators encourage enrollment in the Agriscience and Natural Resources Education program.	1	2	3	4	5	6

Part IX - General Restructuring

What are your perceptions of various statements in relationship to the general restructuring process? Please indicate the extent to which you agree or disagree with each of the following statements.
(Firmly Disagree = FD; Disagree = D; Slightly Disagree = SD; Slightly Agree = SA; Agree = A; Firmly Agree = FA)

FD	D	SD	SA	A	FA		
1	2	3	4	5	6	89.	There is time to implement the Agriscience and Natural Resoruces Education Curriuclum.
1	2	3	4	5	6	90.a.	The Agriscience and Natural Resources Education restructuring process is a "quick-fix" solution.
1	2	3	4	5	6	90.b.	The Agriscience and Natural Resource Curriculum has made a positive difference in the local Agricultural Education Program.
1	2	3	4	5	6	91.	The Standards for Excellence was of value during the Restructuring Process.
1	2	3	4	5	6	92.	The Agriscience and Natural Resources Education curriculum project was developed from the grassroots.
1	2	3	4	5	6	93.a.	MSU, AEE personnel provided support for the development of the restructuring program and curriculum project.
1	2	3	4	5	6	93.b.	MDE-OCTE personnel provided support for the development of the restructuring program and curriculum project.
1	2	3	4	5	6	94.	There are too many competing demands to infuse the Agriscience and Natural Resources Education curriculum into my local district.
1	2	3	4	5	6	95.	The only reason for Restructuring the program was for the added cost funding.
1	2	3	4	5	6	96.a.	The 86 hours to qualify to teach the Agriscience and Natural Resources Education curriculum was of great assists.
1	2	3	4	5	6	96.b.	Additional inservice hours should be required in the future.
1	2	3	4	5	6	97.	The change to Agriscience is a positive move.

During the restructuring process which phases were used: (Check all that apply)

____ 98. Preparation
____ 99. Review
____ 100. Action Plan
____ 101. Implementation
____ 102. The Review Committee members visited and observed the local Agricultural Education program in action.
____ 103. The Review Committee reviewed the support materials.

Part X - Personal Data (Demographics)

104. Gender (Check one)
a. ____ Male
b. ____ Female

105. Age of respondent: (include this year) _____ years.

106. How many years have you been teaching agriculture? (include this year) _____ yrs.

107. Please indicate the number of years in current teaching position: (include this year). _____ yrs.

108. Do you teach in a: (Check one)

a. _____ comprehensive high school (go to question 110).
b. _____ career center (go to question 109).
c. _____ comprehensive high school that is designated career center. (go to question 109).

109. If you teach in a career center what is your specialty area: (Check all that apply)

a. _____ Floriculture
b. _____ Greenhouse
c._____ Landscape
d. _____ Ag Mechanics
e. _____ Agriscience
f. _____ Forestry

110. What percent of the day are you teaching Agriscience and Natural Resources? _____%

111. Do you consider yourself a: (Check one)

a. _____ Production Agricultural Instructor
b. _____ Horticulture Instructor
c. _____ Agriscience Instructor
d. _____ Ag Mechanics Instructor

112. Please indicate your highest degree completed. (Check one)

a. _____ High School Diploma
b. _____ Associate's
c. _____ Bachelor's
d. _____ Masters
e. _____ Specialist
f. _____ Ph.D
g. _____ Post Doctoral

113. Please indicate your current certification. (Check one)

a. _____ Secondary Provisional Certificate with Vocational Endorsements
b. _____ Permanent (Continuing) Certificate with Vocational Endorsements
c. _____ Temporary Vocational Authorization
d. _____ Full Vocational Authorization
e. _____ Annual Authorization

114. Please indicate if you are involved on any of the following district wide committees: (Check all that apply)

a. _____ Vocational Committee
b. _____ Curriculum Committee
c. _____ Science Committee
d. _____ Math Committee
e. _____ School Improvement
f. _____ Negotiation Committee
g. _____ Other (Please specify) _____

115. Were you involved in the development and/or writing of the Michigan Agriscience and Natural Resources Core Curriculum?

(Check one) _____ Yes _____ No

(Please continue on back cover)

116. Were you involved or did you serve on the Standards For Excellence development committee?

(Check one) _____ Yes _____ No

117. Please indicate the clock hours of inservice/shadowing completed over the last three years. ____ Hrs.

118. Do you currently have an FFA Alumni Chapter?

(Check one) _____ Yes _____ No

119. Did your advisory committee serve as your review committee?

(Check one) _____ Yes _____ No

120. Is your FFA Alumni and Advisory Committee the same group?

(Check one) _____ Yes _____ No

121. Is your Advisory committee approved by the school administration?
(Check one) _____ Yes _____ No

122. Do you live in the community in which you teach?

(Check one) _____ Yes _____ No

123. Your school district is considered: (Check one)

a. _____ Rural b. _____ Urban c. _____ Suburban

124. During the restructuring process how many formal committee meetings did you hold? (Check one)

a. _____ one
b. _____ two
c. _____ three
d. _____ four
e. _____ five
f. _____ six or more

125. How many students are in your high school (sending schools)? _____ students.

126. Please address any concerns or comments regarding the restructuring process/or implementation of the Agriscience and Natural Resources curriculum. Include any reaction toward modification of the curriculum or the Standards Of Excellence.

_____

_____

_____

_____

_____

_____

_____

Thank you for completing this questionnaire

APPENDIX C

SUPPLEMENTAL MATERIALS FOR SURVEY INSTRUMENT

Key Points

* Instrument is long.

* Instrument contains BEFORE and AFTER Question

* Agriscience = Horticulture and Production Agriculture

SCALE

* If you feel the question should be yes or no but is on a scale

YES = (All the time) Firmly Agree

YES = (Most of the time) Agree

NO = (Never happens) Firmly Disagree

NO = (Most of the time) Disagree

"At what level?"

"Always a degree?"

Example 4:

10. When teaching to what extent are you using the following Agriscience and Natural Resources Curriculum Guides? (Enter the appropriate percentage.)

Natural Resources and Michigan Agriculture (100)	____%
Plant Science (200)	____%
Animal Science (300)	____%
Business Management and Marketing (400)	____%
Landscape Design and Construction	____%
Advance Floriculture (AS200D)	____%
Advance Animal Science (AS300A)	____%
Equine (AS300B)	____%
Small Animal Science (AS300C)	____%

"PERCEPTION"

Example 3:

11. Please indicate what type of credit your courses receive before and after restructuring. (Check all that apply)

Before Restructuring		After Restructuring
_____	General Education	_____
_____	Vocational Education	_____
_____	Science	_____
_____	Mathematics	_____
_____	Speech	_____
_____	Economics	_____
_____	Business	_____
_____	Other _____	_____
_____	_____	_____

"ACTUAL"

Example 2:

Please indicate to what extent you use/or used the following verbs during the educational process.

If you Never used circle 1 — If you Often used circle 4
If you Seldom used circle 2 — If you Always used circle 5
If you Sometimes used circle 3

Before Restructuring							After Restructuring						
N	S	SO	O	A			N	S	SO	O	A		
1	2	3	4	5		Debate	1	2	3	4	5	6	
1	2	3	4	5		Identify	1	2	3	4	5	6	

"PERCEPTION"

Example 1:

Please indicate the extent to which you agree or disagree with each of the following statements.

If you Firmly Disagree circle 1
If you Disagree circle 2
If you Slightly Disagree circle 3
If you Slightly Agree circle 4
If you Agree circle 5
If you Firmly Agree circle 6

FD	D	SD	SA	A	FA	
1	2	3	4	5	6	I enjoy teaching agriscience (The respondent agrees with the statement.)

"PERCEPTION"

* Perception is a combination of attitudes and experiences about "something" therefore all questions should be answered!

* ANSWER ALL QUESTIONS

PLEASE ANSWER EACH "FIVE AND SIX" POINT SCALE QUESTIONS WITH YOUR OWN PERCEPTION NOT ACTUAL PRACTICE!

APPENDIX D

FIRST COVER LETTER

September 23, 1993

1~

Dear 2~:

Secondary agricultural education programs in Michigan have experienced drastic changes over the past several years. Currently, programs have completed restructuring to become Agriscience and Natural Resources programs. Part of this restructuring process included the adoption of the Michigan Agriscience and Natural Resources Curriculum.

As a member of the agricultural education profession in Michigan, your use of, and opinions about the curriculum and restructuring process is important. In order to improve the quality of Michigan's Agriscience and Natural Resources Programs the return of your completed questionnaire is very important.

You indicate your voluntary agreement to participate by completing and returning this questionnaire. You may be assured of complete confidentiality. The questionnaire has an identification number for mailing purposes only. This is so that we may check your name off of the mailing list when your questionnaire is returned. Your name will never be placed on the questionnaire.

The results of the final questionnaire will be shared with the officers and members of the Michigan Association of Agriscience Educators, the Michigan Horticulture Teachers Association, and the Michigan Department of Education. Please return your completed questionnaire by October 8, 1993 in the enclosed self-addressed stamped envelope.

Thank you for your assistance.

Sincerely,

Carroll H. Wamhoff Chairperson, AEE	Dave Krueger Michigan FFA Foundation Executive Director	Randy Showerman Instructor

RS/dlv

APPENDIX E

POSTCARD REMINDER

Dear John:

Last week you were mailed a Michigan Agriscience and Natural Resources Curriculum survey. If you have already completed and returned the survey please accept our sincere thanks. If not, please do so as soon as possible.

The return of your completed survey is important in order to determine teachers' perceptions of the Michigan ANR Curriculum and restructuring process. The opinions of Michigan teachers will be used to improve future curriculum development activities. If by some chance you did not receive the survey, or it got misplaced, you will receive another survey within the next two weeks.

Sincerely,

Dave Krueger
&
Randy Showerman

APPENDIX F

SECOND COVER LETTER

October 11, 1993

1~

Dear 2~:

Two weeks ago you were mailed a questionnaire on Secondary Agricultural Education programs in Michigan. As of this writing, your response was not among the returned questionnaires. If you have returned the questionnaire, please disregard this letter.

As a member of the agricultural education profession in Michigan, your use of, and opinions about the curriculum and restructuring process is important. In order to improve the quality of Michigan's Agriscience and Natural Resources Programs the return of your completed questionnaire is very important.

You indicate your voluntary agreement to participate by completing and returning this questionnaire. You may be assured of complete confidentiality. The questionnaire has an identification number for mailing purposes only. This is so that we may check your name off of the mailing list when your questionnaire is returned. Your name will never be placed on the questionnaire.

We appreciate your help in completing the enclosed questionnaire and returning it in the enclosed envelope by October 15, 1993. Your response will provide essential information that will assist us in developing a viable and contemporary agricultural education program for the coming decade and beyond.

If you have any questions concerning this survey form or study, please call Randy Showerman or Dave Krueger at (517) 355-6580.

Thank you for your assistance.

Sincerely,

Carroll H. Wamhoff Chairperson, AEE	Dave Krueger Michigan FFA Foundation Executive Director	Randy Showerman Instructor

RS/dlv

APPENDIX G

THIRD COVER LETTER

October 25, 1993

1~

Dear 2~:

Two weeks ago you were mailed a second questionnaire on Secondary agricultural education programs in Michigan. As of this writing, your response was not among the returned questionnaires. If you have returned the questionnaire, please disregard this letter.

As a member of the agricultural education profession in Michigan, your use of, and opinions about the curriculum and restructuring process is important. In order to improve the quality of Michigan's Agriscience and Natural Resources Programs the return of your completed questionnaire is very important.

You indicate your voluntary agreement to participate by completing and returning this questionnaire. You may be assured of complete confidentiality. The questionnaire has an identification number for mailing purposes only. This is so that we may check your name off of the mailing list when your questionnaire is returned. Your name will never be placed on the questionnaire.

We appreciate your help in completing the enclosed questionnaire and returning it in the enclosed enveloped by October 29, 1993. Your response will provide essential information that will assist us in developing a viable and contemporary agricultural education program for the coming decade and beyond.

If you have any questions concerning this survey form or study, please call Randy Showerman or Dave Krueger at (517) 355-6580.

Thank you for your assistance.

Sincerely,

Carroll H. Wamhoff Chairperson, AEE	Dave Krueger Michigan FFA Foundation Executive Director	Randy Showerman Instructor

RS/dlv

APPENDIX H

FOURTH COVER LETTER

November 8, 1993

1~

Dear 2~:

Two weeks ago you were mailed a third questionnaire on Secondary agricultural education programs in Michigan. As of this writing, your response was not among the returned questionnaires. If you have returned the questionnaire, please disregard this letter.

As a member of the agricultural education profession in Michigan, your use of, and opinions about the curriculum and restructuring process is important. In order to improve the quality of Michigan's Agriscience and Natural Resources Programs the return of your completed questionnaire is very important.

You indicate your voluntary agreement to participate by completing and returning this questionnaire. You may be assured of complete confidentiality. The questionnaire has an identification number for mailing purposes only. This is so that we may check your name off of the mailing list when your questionnaire is returned. Your name will never be placed on the questionnaire.

We appreciate your help in completing the enclosed questionnaire and returning it in the enclosed enveloped by November 15, 1993. Your response will provide essential information that will assist us in developing a viable and contemporary agricultural education program for the coming decade and beyond.

If you have any questions concerning this survey form or study, please call Randy Showerman or Dave Krueger at (517) 355-6580.

Thank you for your assistance.

Sincerely,

Carroll H. Wamhoff	Dave Krueger	Randy Showerman
Chairperson, AEE	Michigan FFA Foundation Executive Director	Instructor

RS/dlv

APPENDIX I

UNDUPLICATED COURSE TITLES REPORTED BEFORE RESTRUCTURING

Course titles before restructuring

Ag I
Ag II
Ag III
Ag IV
Ag Buildings
Equipment
Ag Business
Production
Ag Careers
Ag Management
Ag Mechanics
Ag Technologies
Animal Husbandry
Animal Life
Animals
Animal Science
Basic Soils
Computer applications
Conservation and Natural Resources
Conservation Technology
Crops
Crop Science
Dairy
Eighth Grade Ag
Environmental Science
Exploring Ag
Farm Management
Farm Mechanics
Farm Shop
Floral Design
Floriculture
Flowershop Operations
Forestry
Forestry and Heavy
Forestry and Wildlife
Fruit & Vegetable
General Ag
Greenhouse
Horticulture
Intro to Ag
Landscape
Lawn Maintenance
Livestock Science
Modern Ag
Natural Resources
Natural Resources and Environmental Ed.
Ornamental Horticulture
Plant Life
Plant Science
Plant Tech
Production Ag
Small Engines
Small Animal Care
Soil Science
Vocational Forestry

APPENDIX J

UNDUPLICATED COURSE TITLES REPORTED AFTER RESTRUCTURING

Course titles after restructuring

Advanced Ag
Advanced Animal Science
Advanced Floriculture
Advanced Mechanical Systems I
Advanced Plant Science
Ag & Natural Resources Management
Ag Economics
Ag Management
Ag Sci & Technology
Agri-biology
Agribusiness
Agribusiness & Marketing Management
Agriscience
Agriscience & Horticulture
Animal Science & Management
Animal Physiology
Animal Science
Applied Technologies
Basic Animal Science
Basic Bio/Agriscience
Basic Botany
Basic Plant Science
Biology Related Technology
Botany (Plant Science)
Business Management & Marketing
Computer Applications
Conservation & Natural Resources
Conservation Technology
Crop Science
Ecology
Environmental Education
Environmental Science
Environmental Technology
Equine Science
Exploring Agriculture
Farm & Ranch Management
Farm Business Management
Mechanics
Farm Shop
Floral Design
Floriculture
Forestry
General Ag Animal Science
Golf Course Maintenance
Greenhouse Crops
Greenhouse/Landscape
Greenhouse Management
Horticulture / ANR
Intro to ANR
Landscape & greenhouse Mgmt.
Landscape Design & Construction
Landscaping
Lawn Maintenance
Michigan Ag & Natural Resources
Natural Resources
Natural Resources & Ecology
Natural Resources & Environmental Ed.
Natural Resources & Michigan Ag
Natural Resources Science
Physical Soil Science
Plant & Soil Science
Plant Science
Plant Science & Management
Pre-Veterinarian
Small Animal Care
Small Engines
Soil & Forestry Science
Soil Science
Turf Landscape
Turfgrass Management
Vocational Forestry
Wildlife
Zoology Animal Science

APPENDIX K

STATEMENTS REGARDING FFA
SUPPLEMENTARY TABLES

Table 27

The local FFA chapter is an integral and intracurricular part of the instructional program

Before		After			
Mean	S.D.	Mean	S.D.	T-value	Sign of T
4.60	1.871	4.86	1.57	2.13	.036

Table 28

The local FFA chapter has a written Program of Activities that is an integral part to the Agriscience & Natural Resources Curriculum

Before		After			
Mean	S.D.	Mean	S.D.	T-value	Sign of T
3.77	1.952	4.32	1.715	4.33	.000*

Table 29

The local FFA chapter is provided scheduled class time in which members participate in chapter activities

Before		After			
Mean	S.D.	Mean	S.D.	T-value	Sign of T
3.79	2.017	4.01	1.773	1.60	.113

Table 30

The local FFA chapter has a process to record individual student participation in FFA activities

Before		After			
Mean	S.D.	Mean	S.D.	T-value	Sign of T
3.92	1.789	4.38	1.591	4.23	.000*

Table 31

The local FFA chapter conducts monthly chapter meetings

Before		After			
Mean	S.D.	Mean	S.D.	T-value	Sign of T
4.36	1.870	4.57	1.64	2.26	.026

APPENDIX L

STATEMENTS REGARDING SAE SUPPLEMENTARY TABLES

Table 32

Students are encouraged to have an SAE program

Before		After			
Mean	S.D.	Mean	S.D.	T-value	Sign of T
4.48	1.763	4.81	1.602	2.69	.008

Table 33

SAE programs engage students in activities related to career objectives

Before		After			
Mean	S.D.	Mean	S.D.	T-value	Sign of T
4.122	1.626	4.42	1.546	2.65	.009

Table 34

SAE programs engage students in activities related to instructional program

Before		After			
Mean	S.D.	Mean	S.D.	T-value	Sign of T
4.18	1.65	4.44	1.527	2.71	.008

Table 35

SAE programs count toward credits for graduation

Before		After			
Mean	S.D.	Mean	S.D.	T-value	Sign of T
2.55	1.834	2.82	1.907	2.29	.024

Table 36

SAE programs includes activities such as:

	Before		After			
	Mean	S.D.	Mean	S.D.	T-value	Sign of T
Research	2.95	1.605	3.78	1.742	6.12	.000*
Collections	2.92	1.560	3.49	1.692	5.05	.000*
ANR Comm.	3.00	1.666	3.46	1.776	4.09	.000*
Mentor	3.00	1.054	3.53	1.788	4.75	.000*
Ag Prod. Own	4.02	1.868	4.02	1.810	.000	1.00
Ag Business	4.18	1.791	4.30	1.771	.96	.339

APPENDIX M

TEACHER'S COMMENTS

Teacher's Comments

"The process of creating the curriculum is far more valuable and important than the curriculums themselves."

"The technical hours have been very beneficial. It helps get teachers released."

"The curriculum is fine, but it is still 'Do What You Want - Don't Make Waves - No One Validates'. The standards are not really there."

"We are actively working on integrating agriscience with other areas in hope of having it become part of a core program."

"I have 100 science students and approximately 50 agriscience students, so agriscience is not where I can spend most of my time -- but I still attend all of the meetings etc. of agriscience teachers. We need time to implement all of the changes -- time during the school day."

"We need continued inservice. One day would be better than the two days in September. We need one in the fall and one in late winter. We need to continue to have teachers sharing with teachers on 'things that worked for me'."
"Don't give up on articulation!!"

"I find the curriculum very hard to use and ineffective."

"I felt it was important to review our program."

"Restructuring didn't really change us a lot. We have clustered and FFA has helped."

"The support of MSU and FFA has been great! We only use the floriculture curriculum (and it needs to be rewritten). The other curriculum guides seem to be written toward a particular area. For example, the business needs to be made generic for all areas. Not that much has changed since restructuring, except for clustering with the landscape / greenhouse program, which was dictated to use anyway by the school."

"I believe the switch to agriscience was long overdue, but with my particular set up of 2 hours ag classes, 1 8th grade and 2 regular science, I was incorporating already to some extent agriscience principles into my curriculum before this "switch" was made."

"We need college credit for advanced courses."

"New state science objectives need to be coordinated with the core curriculum. We need funding to implement curriculum changes. We need positive public relations for the changes we have made."

"I hope that MSU will continue to move toward agriscience and that they will support us."

"Improve inservice, make them more science & lab oriented and less production oriented."

"I believe we need to revisit our curriculum and be sure we are meeting the needs of our students and their ability to score well on the science MEAP test and the Science Competency Test. We need to be sure that our agriscience educators are involved in the writing of the Science Competency Test."

"The major concern is how anyone can incorporate all the core curriculum into a program and still cover needed information required of the given programs. Many of the curricular for the core programs are covered in other classes in our school. There seems to be an overlapping of materials. Are we going to teach science and biology and not what makes many of our programs unique? I seems that a lot of the core curriculum should be already covered in other science classes in our schools or are we going to try to teach these fields and ours also?"

"Overall, it is a positive step forward. State support would make it much more effective. Full articulation with Ferris and MSU for ag science programs will help the process and encourage higher level high schoolers to enter our field."

"Any time an administrator is forced into reviewing a program is a wonderful opportunity for teacher to obtain improvements and to show off their successes."

"Time well spent."

"The materials need to be 'streamlined' to become more user friendly."

"More communication with school administrators to let them know (from MSU) what we are doing and that it is time consuming. Teacher release time may be in order."

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