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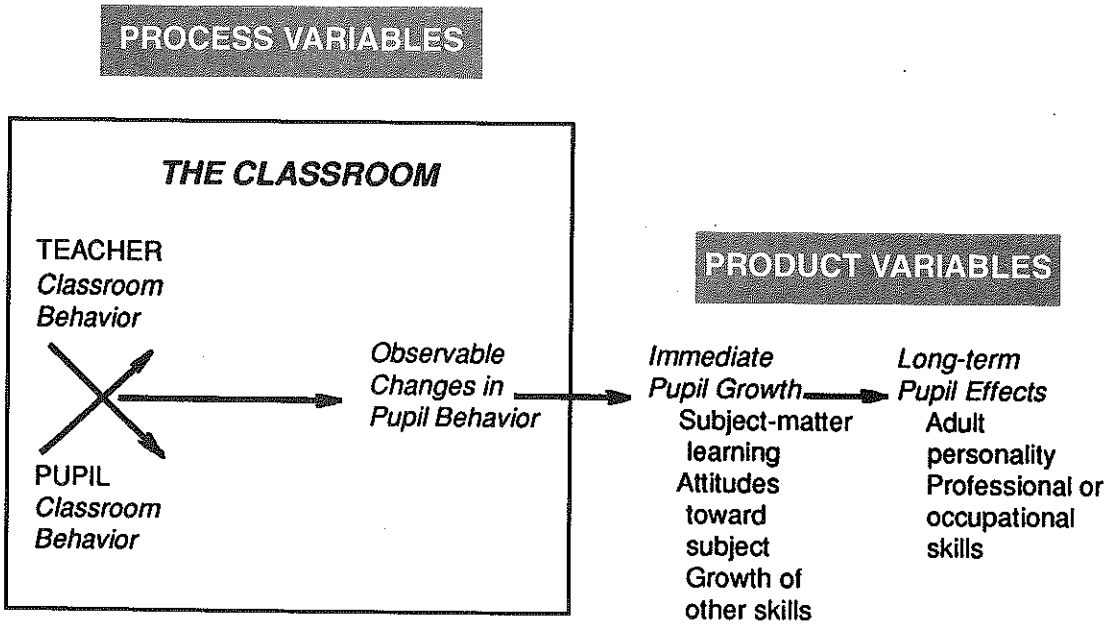

Research Findings: Using What We Know to Improve Teaching and Learning

Research on the Teaching of Agriculture
SAE Research Findings
Improving Leadership Development

THE
AGRICULTURAL EDUCATION
MAGAZINE

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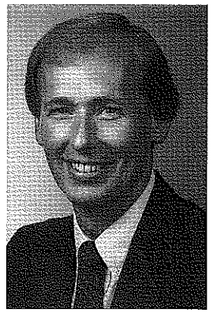
Research and Practice — Operating in Isolation



BY ED OSBORNE
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Most researchers in agricultural education would readily agree that the quality and quantity of agricultural education research has dramatically improved in the past 20 years. Perhaps so. But how has practice in agricultural education changed as a result of what has been discovered through research? We may be hard pressed to cite specific changes that have occurred due to research findings. Instead, researchers tend to discuss findings among themselves, while decisions made by practitioners continue to be based mostly on intuition and very little on what has been learned through research.

Problem solving teaching (PST) serves as a good example to illustrate the separate tracks that research and practice have taken. Although PST continues to be promoted as the preferred approach to teaching and learning in agricultural education, its effectiveness has been examined by only a handful of studies. The empirical evidence to support or refute problem solving teaching is too limited to be conclusive. Furthermore, many teachers and teacher educators do not use PST. Research and practice in this case are out of sync.

Another example is the research on levels of cognition reached in instruction and testing. Although a healthy stream of research has developed on this topic, its impact on practice has been limited. Why? Because in agricultural education, the primary consumers of research have been other researchers. And, in general, most teachers continue to base their instructional and testing decisions on philosophy and intuition. By contrast, private companies often can't wait to get research results from scientists in agronomy and engineering. In fact, research in these areas is often funded by businesses and agencies, which quickly turn that research into new products and methods. What new products and methods have developed in agricultural education as a result of research discoveries?

Who are the consumers of research in agricultural education? Who should be the consumers of research in agricultural education? Based upon informal observations by this writer, agricultural education research is mostly internally consumed. That is, most consumption that occurs is by other researchers. However, the real consumers of agricultural education research should be agricultural educators in the field. Both researchers and practitioners in the field are to blame for the isolation of research and practice.

Researchers often disseminate their findings only to other researchers. Stopping short of wider dissemination to practitioners in the field makes a study have academic value but little or no impact on practice. This is true even though much of the research in agricultural education has been drawn out of practices and problems in the field. The nature of research in agricultural education also contributes to this problem. Compare a journal article or research summary on an agricultural education topic with one completed on an animal science topic. Agricultural education research tends to be broad sweeping, lacking in focus and singularity by comparison. As a result, findings from agricultural education research tend to fall short of providing clear answers to the problem being addressed. The impact of such research on practice quickly fizzles. The difficulty in focusing (narrowing) agricultural education research should be recognized, but it should not be offered as an excuse for conducting research that does not translate into changes in practice.

Teachers must also admit that they have made a weak attempt to understand research and to alter how they teach based upon what had been discovered through research. In private business strong financial incentives drive a keen interest in research. On the other hand, the incentives for teachers to change their instructional practices are much less definable and compelling. For these and other reasons, research-based practice in agricultural education is hard to pinpoint.

Research in agricultural education is often criticized for lacking a sustained focus. Yet even when clear findings emerge, they are often ignored, or at least, do not result in widespread change. Nonetheless, the quality of research in agricultural education is improving. Greater dialog between researchers and practitioners in the field is sorely needed. More focused, programmatic, long-term research conducted by individuals or teams of scientists should significantly increase the impact of research in agricultural education. Teachers in the field must be more motivated to study research findings and consider how this new knowledge can be used to strengthen their educational programs. Just as university faculty must find the time in their overloaded schedules to conduct meaningful research, teachers must find the time in their equally demanding schedules to become active consumers and beneficiaries of this research. Finally, systematic dissemination of research findings to practitioners is a prerequisite for research-supported change in the field. These and other strategies must be implemented if we are to bring research and practice in agricultural education together. ■

Using Research Findings to Enhance Educational Programs—From Bookshelf to Practice

BY JIMMY G. CHEEK,
THEME EDITOR
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One of the most common complaints about educational research is that it is conducted, published, and then sits on the bookshelves of researchers, teachers, and administrators with little, if any, attempt to put it into practice. This criticism is not only true of educational research, but of other types of research as well. However, this criticism is most acute in the field of education.

Recent Progress

In recent decades, significant strides have been made in agricultural education research. Some of those accomplishments are as follows:

- The quantity of research conducted at various universities throughout the country has substantially increased. One need only to look at the *Journal of Agricultural Education* and the National Agricultural Education Research Meeting to note the number of papers that have been written, submitted, presented, and published in the past 20 years. The growth is dramatic.
- The quality of this research has increased tremendously. The academic rigor and statistical and research methodologies have greatly improved in the past 20 years.
- The relevance of the research has also increased. Research topics are more relevant to practitioners and address some of the most critical issues facing the profession. Likewise, there has been an emphasis at many universities toward "programmatic research." Programmatic research is conducted, over time and space, to solve a variety of problems related to a specific topic. Programmatic research usually involves numerous studies conducted by several researchers over several years.

Despite all of these advances, many of the research findings do not find their way into practice. They are not used by educators to solve problems and improve programs. This is unfortunate, because research has answered many questions that would help practitioners and improve programs.

Challenge for Researchers and Practitioners

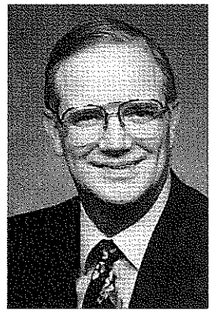
The challenge for researchers is to conduct research significant to the profession and to clearly communicate the findings and their application to practitioners in meaningful ways. In turn, the challenge for practitioners is to use research findings to help improve educational programs for students, adults, and other clientele who are the direct beneficiaries of their programs. To do this, a variety of things must occur:

- Knowledge of the research findings. The first challenge for practitioners is knowledge regarding research findings. Researchers must take the necessary steps to inform the profession about their findings in a clear, concise fashion.
- Understanding research findings. Educators must understand the research's implications, limitations, and application to their programs.
- Application. The third challenge is to apply research findings to educational programs. Research has relevance when it improves programs, increases learning, and solves significant problems.
- Improvement of programs. As a consequence of knowing, understanding and applying educational research findings, the ultimate aim of research—to improve programs—is reached, thereby enhancing the education of clientele participating in programs.

It is appropriate that this issue of *The Agricultural Education Magazine* is dedicated to a review of research literature and its application to practice. In this issue, a very competent and distinguished group of scholars has synthesized research findings as they relate to classroom instruction; supervised agricultural experience; FFA; adult education; and curriculum planning. It is their intent to identify ways in which practitioners can use those findings in further developing their educational programs.

I am reminded of a quote by Joel Baker. He said, "Vision without action is merely a dream. Action without vision just passes the time. Vision with action can change the world." In this issue the authors have provided a vision of what could be a consequence of analyzing and applying research findings. If we take what is written here and put it into action, we can "change the world" for students who study in our programs and significantly improve their educational experiences. The challenge is ours. I trust that we will respond appropriately. ■

Philosophy and Research on the Teaching of Agriculture



BY J. DAVID MCCRACKEN
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Wherever a good teacher is found, a story may be uncovered of a long patient search for better ways of instructing young people. It is a story of growth through effort. (Lancelot, 1929, p. 4)

Is it time to rethink what we know about teaching? Terms such as the national information infrastructure, distance education, video conferencing, advance placement credit, interactive video, and computer-assisted instruction are commonplace. Are the traditional methods applicable to modern technology? Will the good teacher of the past be a good teacher in the future? What is good teaching? Should we look to research for answers about how we should teach, or should we base our practice on the particular philosophy we embrace?

Good teachers are interested in teaching, have a passionate desire to be superior teachers, seek to understand the principles which govern teaching and find better ways to apply them in their work, try ways to perfect their actual teaching skill, and find genuine pleasure and satisfaction in teaching (Lancelot, 1929).

The true role of good teachers is revealed by our own experience. We are ourselves different because we have had such teachers. In some way they reached into our lives, changing our interests, purposes and goals, our attitudes and feelings, our philosophy of life, our understanding of its problems, and our habits, abilities, and skills. They gave us a store of useful knowledge, which for some reason has remained with us. Those who were highly skilled taught us to think straight and far, to avoid mistakes, and to plan our own lives successfully. (Lancelot, 1929, p. 1)

Good teachers do much more than communicate subject matter effectively. How can we know what it is that makes a teacher good or bad? According to Fraenkel and Wallen (1993), we can know through sensory experiences, agreement with others, expert opinion, logic, and the scientific method. Some of what we have learned about good teaching has been based on research (the scientific method), but much of our knowledge is based on the "learning by doing" philosophical position of the agricultural education profession. This philosophical position has been grounded in sensory experiences, agreement with others, expert opinion, and logic.

Learning by Doing

Where shall we start on our venture into good teaching? There are many possible approaches, many entrances. . . A first principle of good teaching [is] that it should be concerned with meeting the needs of the learners. . . It should deal with essential knowledge. it should be practical. (Stewart, 1950, p. 2)

Burkett, Stevens and Hill in 1903 encouraged teachers of agriculture to:

Lead the pupils out into the field, make simple experiments before them, and have them also perform experiments. Let them learn directly from nature: a fact gained at firsthand will linger in the mind long after mere secondhand book knowledge has departed. Teach by observation and experiment. The young mind grasps the concrete but wearies with the abstract. . . In many cases it will be best to perform the experimental or observational work first, and turn to the text later to amplify the pupil's knowledge. (p. xi)

Charters (1913) suggested that agriculture be taught as one of the common subjects in rural and graded schools. The methods for teaching agriculture were described as (1) identification of a practical problem; (2) collection of data; (3) encouragement of intelligent guessing; (4) obtaining information from textbooks, bulletins, experiments, class trips; and (5) drill and memorization (when necessary).

In the years prior to the Smith-Hughes Act, most of the agriculture course work in the high schools appears to have been informational rather than vocational. Care was taken to prevent the new training from becoming the old traditional mode of rote memorization of facts. Most of the vocational agriculture students of the time lived on farms and were engaged in home projects. Much of the classroom instruction was based on problems encountered at home with production enterprises. This scheme fit well into the ideas of contemporary educational philosophers who were attempting to direct education away from the regimented methods of the traditional classical teachers (Herren, 1987). →

Dewey denounced the formalism of traditional education as having its emphasis on overly strict discipline, passive learning, and pointless detail. He saw the task of the teacher as a guide to the student on his or her journey through learning (Herren, 1987). He wanted schools to become communities in which intelligence was freed for inquiry, places where knowledge was not offered ready made, and where the record of knowledge was not mistaken for knowledge (Dewey, 1916).

If children are to become genuine inquirers, they must have real questions they want to answer; they must encounter problematic situations other than wondering what the teacher wants. They must be active agents, doing things in order to discover the consequences, not mere passive recipients of facts discovered by others (Robertson, 1992).

Problem-Solving Teaching

The problem-solving approach advocated by Dewey consisted of five steps which required the student to: (a) recognize a problem, (b) define a problem, (c) offer many possible solutions, (d) test the hypotheses, and (e) verify the final conclusion. (Colman, 1967, p. 112)

Agricultural educators have traditionally encouraged a problem-solving approach to teaching. In 1983, McCracken indicated:

We should be preparing teachers who use problem solving as an approach to teaching and learning, teachers who believe in and can orchestrate learning by doing, [and] teachers who encourage students to assume responsibility for their own learning. . . (p. 8)

However, in 1993 questions were being raised about the lack of legitimate problems in the agricultural education curriculum.

What is there about agricultural education that has continued too long, that has not kept up with the times? . . . As we examine the programs and structures that have served us well for many years we find the secondary program attempting to rely on . . . problem solving as an approach to teaching using contrived problems because students are not experiencing the curriculum. (McCracken, 1993, p. 10)

Newcomb, McCracken and Warmbrod (1986) asked us to:

Consider the fact that every day people learn on their own, without the presence of teachers. . . By identifying this process that people use rather automatically—and use successfully—then could one not teach students in a formal classroom following that same process? Would it not make sense for teachers to teach people by following the same process that people generally follow in learning on their own? (p. 65) An essential element of learning is that unless the subject matter under study is processed in a meaningful and understandable manner by the learner, little will be learned or retained. (p. 21)

Krebs (1967) suggested:

The emphasis on "teaching for understanding" is undoubtedly the most important single development in improvement of teaching in recent years. . . The problem-solving approach in teaching. . . makes greater use of the accumulated knowledge about learning than does any other approach to teaching. (p. 37) . . . it seems that problem solving, as a technique. . . can be a most successful and challenging approach to a real and vital educational program, one that goes a long way toward providing for readiness for learning, motivation, organization, and transfer of training—elements that most educators agree are crucial in the learning process. (pp. 65-66)

Research on Teaching

Dewey accorded a high value to science because it is a self-correcting enterprise. He believed it commonplace that what was regarded as scientific truths at one point in time might be rejected later in light of new discoveries. He believed that one could employ faulty methods, discover their faults, and make improvements, that our inherited beliefs could be tested and modified through a communal process of inquiry that makes use of intelligence. By discovering the causes and consequences of our actions, we can make judgments about the best course to pursue.

The methods of science are specialists methods, but the scientific attitude is available to everyone, not merely an elite. The scientific attitude involves a willingness to suspend action in the face of a problematic situation and an inclination to engage in inquiry in trying to decide how to resolve the problem. The problematic situation is always the impetus to inquiry, followed by a clarification of the problem, the development of hypotheses about how to solve the problem, and their evaluation and testing either imaginatively or overtly through action (Robertson, 1992).

The agricultural education profession has been challenged by scholars who have argued that there is little scientific evidence that problem-solving teaching is more effective than other approaches. Moore and Moore (1984) said that "the primary basis for the problem-solving approach to teaching appears to be philosophical . . . There appears to be virtually no research base to support the problem-solving approach to teaching" (p. 5). Wallen and Travers (1963) suggested that "proponents of the intellec- →

tual merits of less authoritarian procedures for the public schools have yet to ground their case on research with school children" (p. 477).

Four relevant research studies in agricultural education have been conducted on the problem-solving approach to teaching. In a study of the use of problem-solving teaching among secondary agriculture teachers in Illinois, Osborne and Hamzah (1989) reported that teachers' use of problem solving could be explained by their attitudes toward the method, their confidence in using problem solving as a beginning teacher, their use of problem solving as a student teacher, and the percentage of their students with supervised agricultural experience programs. Teachers tended to organize their lessons by problem area, but few actually taught using a problem-solving approach. Those with more teaching experience were more likely to teach using a problem-solving approach (p. 35).

In a quasi-experimental study comparing a problem-solving approach with a subject matter approach, Flowers and Osborne (1988) reported that the problem-solving approach was no more or less effective than the subject matter approach as measured by student achievement, regardless of the cognitive level of the questions. The two groups also had equivalent results on the delayed retention test. However, for high-level cognitive items, students taught by the problem-solving approach exhibited lower achievement loss than students taught by the subject matter approach (p. 26).

Boone and Newcomb (1990) in an Ohio study reported that:

Teachers in the study performed in one of two ways. Two teachers did not use the problem-solving approach to teach the instructional unit designated by the researcher to be taught using the problem-solving approach. The other four teachers incorporated many features of the problem-solving approach in their instructional unit designated by the researcher to be taught with a subject matter approach. . . A positive relationship between the degree to which a teacher used the problem-solving approach and the level of student achievement was observed. (p. 12)

This study confirms both the validity of problem solving as an approach to teaching and also the difficulty for teachers who have not internalized the problem-solving process of teaching to use it effectively. McKee and Warmbrod (1992) concluded that:

The research clearly indicates a lack of agreement among student teachers, cooperating teachers, and university supervisors about what constitutes problem-solving teaching. The hint is strong that there is misunderstanding and possible disagreement regarding what problem solving teaching is and how it is demonstrated. Analysis of the rationale, nature, and practice of problem solving teaching also requires a reassessment of instruments used to quantify both perceptions and actual use of problem-solving strategies and techniques.

As we look at research conducted outside of agricultural education, we find that much is known about teaching and learning. This research deals with relationships between or among variables, including nearly all of the process-product research; a portion of the research pertaining to teacher thinking, cognitive processing, and teacher expectancy; and a number of studies dealing with the topics of learning to teach and staff development. Research as the preferred vehicle to discover knowledge about teaching is advocated in *The Scientific Basis of the Art of Teaching* (Gage, 1978). Gage contends that teaching is an art which is based on science. The science that is the basis for teaching is psychology. The more recent book by the same author, *Hard Gains in the Soft Sciences: The Case of Pedagogy* (Gage, 1985), indicates that knowledge about teaching becomes more trustworthy as it is confirmed through replications, that is, repetitions of more or less similar investigations. Such confirmations add more to the persuasiveness of the evidence than does the statistical significance, no matter how strong, of a single result.

Knowledge Base for the Beginning Teacher (Reynolds, 1989) was an attempt to codify the knowledge accumulated through scientific studies, and also demonstrate that teaching does have a distinctive knowledge base.

Research has shown that there are some powerful determinants of effective teaching. They include: (1) use of cues, engagement, corrective feedback, and reinforcement; (2) having high expectations for students; (3) use of frequent testing; (4) use of questioning; (5) having homework expectations that increase student engagement with subject matter; (6) use of inquiry methods where students develop hypotheses and conduct investigations; (7) students learning under teacher supervision as opposed to working on their own; (8) having subject matter well-organized and structured, involving some degree of redundancy; (9) being clear; and (10) demonstrating enthusiasm (Osborne, 1993).

Five teacher behaviors showing the most promise in influencing student achievement are: clarity, variability, enthusiasm, task-oriented and/or business-like behaviors, and student opportunity to learn criterion material. Clarity involves explaining and demonstrating concepts in a manner that can be understood by students, making points easy to understand, and answering questions in an intelligent and complete manner. Variability requires teachers to use a variety of teaching methods and techniques, even within a single teaching period. →

Enthusiasm from teacher to student tends to be contagious, inspiring interest on the part of students in the instructional content. Task-oriented and/or business-like behaviors are reflected by structured, organized, and guided teaching activities. Student opportunity to learn criterion material requires instruction and student learning activities based upon established objectives (Garton, Miller, & Torres, 1992).

Conclusion

The value of teaching our students how to think will be even more critical in the informational world of the future. . . We need to develop in agricultural students an intellectual autonomy, which implies the ability to conceptualize problems facing the agricultural industry of today and tomorrow, combined with a supportive and responsible attitude for identifying solutions to those problems. . . [We need to] develop in students the reasoning and problem-solving ability to transfer knowledge to real life situations beyond the school. (Crunkilton, 1984, p. 12)

There is no single teaching technique or approach that will with a 100% effectiveness transfer the ability to think and solve problems from one person to another, teacher to student. But, the best foundation discovered to date that captures all of the rudimentary elements of education into one process for developing this reasoning and problem-solving ability in students is through the problem-solving approach to teaching. (Crunkilton, 1984, p. 16)

Resolving to be an excellent teacher will require unusual effort to learn the science of teaching, and then to apply that science by employing the best of one's abilities and talents in the art and craft of teaching.

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SAE Research Findings

BY TRACY HOOVER AND LARRY R. ARRINGTON

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Experiential learning has long been recognized as being important to teaching and learning in agricultural education programs. Experiential learning has been provided through several means, including FFA activities, land laboratories, field trips, and supervised agricultural experience programs (SAE). SAE includes "the actual, planned application of concepts and principles learned in agricultural education. Students are supervised by agriculture teachers in cooperation with parents/guardians, employers and other adults who assist them in the development and achievement of their educational goals. The purpose is to help students develop skills and abilities leading toward a career" (National Council for Agricultural Education, 1992). Most agricultural educators have agreed that SAE helps teachers be more effective in causing learning to occur, assists students in understanding the relevance of classroom instruction, and promotes close cooperation with parents and the community. Research related to SAE has focused on a broad array of subjects over the past 50 years. The focus of this article is to provide an overview of research related to SAE.

SAE and Learning

Probably the most fundamental question that has been investigated through the years has been whether or not SAE participation is related to achievement in agricultural education.

> *"Probably the most fundamental question that has been investigated through the years has been whether or not SAE participation is related to achievement in agricultural education."*

Several researchers have investigated this topic using a variety of research procedures. Many of these studies have indicated a positive relationship between SAE participation and student achievement in agricultural education.

Morton (1978) found a positive relationship between the quality of supervised agricultural experience program and achievement as measured on a written test of agricultural knowledge. Similarly, Noxel and Cheek (1988) found a positive relationship between SAE scope and student achievement in horticulture for students enrolled in ornamental horticulture. Arrington and Cheek (1990) conducted a similar study with 10th grade students enrolled in general agricultural education programs in Florida and found a positive relationship between SAE participation and achievement as measured with a written test. Cheek, Arrington, Carter, and Randell (1994) found a moderate, positive correlation between SAE participation and student achievement in agriscience programs in Florida.

Gibson (1987) studied senior agricultural education students in Kentucky and reported a positive relationship between quality of supervised agricultural experience programs and student overall grade point average. Buyck (1989) concluded that students who have supervised agricultural experience programs will have higher grade point averages in vocational agricultural education. Bruton (1967) reported that first-year animal science students at Oklahoma State University who had participated in animal-related SAE programs in high school had higher knowledge levels.

Other studies have not found student achievement to be related to SAE participation. Potter (1984) reported that program scope was not related to mainstreamed handicapped student achievement in agriculture course work. Tylke and Arrington (1988) found no positive relationship between SAE scope and student achievement in livestock production.

What Factors Contribute to SAE Effectiveness?

Teacher Characteristics

Research related to SAE has also attempted to identify factors that contribute to SAE effectiveness. Several studies have focused on the identification of teacher characteristics associated with SAE program quality. The amount of supervision provided by teachers has probably been studied more than any other factor. Many of these studies have confirmed the positive relationship between the amount of teacher supervision (supervisory visits) and SAE program quality and/or scope (Thomason, 1965; Arrington, 1981; Harris, 1983; Gibson, 1987; Anyadoh, 1989).

Another factor related to supervision that has been found to be positively related to SAE →

quality is the amount of time committed to SAE by the teacher. Research has indicated a positive relationship between SAE and the amount of work teachers do with fairs and livestock shows (McMillion and Auville, 1976; Gibson, 1987). Studies have found a negative relationship between the number of outside-school activities beyond FFA for which the teacher is responsible and SAE program quality. McMillion and Auville (1976) found that SAE scores were negatively related to teachers having part-time jobs. Byers (1972) reported that the number of students enrolled in agriculture was related to student supervision. The fewer students enrolled, the greater the probability that students would receive supervision by the teacher.

Summer employment of teachers (extended contract) has also been shown to be positively related to SAE quality (Arrington, 1981; Gibson, 1987). Brock (1976) found that a twelve-month SAE program was perceived as beneficial to students by agriculture teachers.

Teacher knowledge and understanding of SAE is another factor that research has reported to be related to SAE. One indicator of this is studies that have reported that teachers with advanced degrees tended to be more effective with SAE and spend more time on SAE supervision (Basinger, 1954; Guiler, 1959). Harris (1983) reported that agriculture teachers who recognized the educational value of SAE tended to have students with higher quality SAE programs. Previous enrollment in high school agriculture by the teacher has also been reported to be positively related to SAE quality (McMillion and Auville, 1976; Anyadoh, 1989).

One final teacher characteristic related to SAE effectiveness is teacher commitment to teach about SAE in the classroom. Gibson (1987) reported a positive relationship between SAE program quality and the amount of classroom instruction on SAE.

Student Factors

Pals (1989) found that parents, instructors, and employer groups reported the five greatest benefits derived from SAE programs were that SAEs (1) promoted acceptance of responsibility; (2) developed self-confidence; (3) provided the opportunity for students to learn on their own; (4) developed independence; and (5) helped students learn to work with others. While these qualities from participation in SAE were perceived as benefits by parents, instructors and employer groups, Baker and McCracken (1994) did not find any relationship between participation in SAE programs and the career maturity of Ohio youth.

A student characteristic that has been reported to be related to SAE effectiveness/participation is "opportunity." Traditionally, a relationship exists between involvement in SAE and rural youth. McMillion and Auville (1976) found a positive relationship between percent of students living in rural areas and SAE scores. Arrington (1981) reported a positive relationship between SAE program scope and students living in a rural area. Gibson (1987) also found a positive relationship between student residence on a farm and SAE program quality.

As more students from urban areas enroll in agricultural education, schools and teachers have to look beyond traditional agricultural production SAE programs. Briers (1978) found that over one-half of the schools in his study provided a facility for SAE. Sinner (1979) studied agriculture programs in Florida and found that over 90% of the schools had land laboratory facilities, and that 47% were using these facilities for student-owned projects. Anyadoh (1989) found a positive relationship between a school farm being provided for SAE and the quality of supervised experience programs. Due to changing demographics of agricultural education students, it appears that teachers will need to be increasingly creative and use school laboratories/resources to ensure that all learners have the opportunity to maintain a quality of SAE.

An additional factor that may be related to SAE quality is FFA involvement. Cheek et al. (1994) found a strong positive correlation between FFA involvement and SAE scope. The researchers posed an interesting question to consider: do high achievers participate more in SAE and FFA, or does participation in SAE and FFA improve achievement?

Contemporary Changes to SAE

In 1992, the National Council for Agricultural Education, in cooperation with the National FFA Foundation, formed a task force to redefine and modernize the traditional SAE and make it reflect today's agricultural industry and educational programs.

Three major types of SAEs emerged from the efforts of the task force: exploratory, entrepreneurship, and placement. Exploratory SAEs provide students the opportunity to investigate a wide range of agricultural careers and subjects. Entrepreneurship SAEs assist students in developing skills and competencies needed to manage and own an agricultural operation or business. Placement SAEs involve the student in employment-related experiences (paid or unpaid) (National Council for Agricultural Education, 1992).

These changes to SAE will provide students additional opportunities to apply and investigate agriculture practices, principles, and occupations. However, as we begin to encourage youth to partake in these types of new SAEs, emphasis needs to be placed on appropriate awards and arenas in which to reinforce and showcase the efforts of students. The National FFA has implemented a task force to address the issue of contemporary awards and contests (Egan, 1994).

Conclusions

Several conclusions seem appropriate, relative to how we can use these research findings to improve teaching and learning through SAE. →

1. Teacher supervision is a primary key to having quality SAE programs.

2. Providing teachers with extended contracts contributes to effective supervision of SAE programs.

3. Teacher involvement with fairs and livestock shows contributes to the SAE program.

4. Teacher understanding of SAE contributes to SAE quality.

5. Teachers who want stronger SAE programs need to be committed to teaching about SAE in the classroom.

6. Opportunity is an important factor contributing to SAE participation. Teachers and/or schools should provide those students with limited resources the opportunity to maintain SAE programs in/on school laboratories.

7. Involvement in the FFA seems to be correlated with SAE scope.

8. Appropriate awards and contests are being developed to reinforce SAE involvement in contemporary and diverse areas of agriculture.

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Using FFA Research to Improve Teaching and Learning

BY BARBARA M. KIRBY, P. MICHAEL BARTHOLOMEW & BECKY J. MIZELLE

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As of June 20, 1994, FFA involved 426,523 members. Nearly one-half million agricultural education students and their teachers believe FFA to be important enough to pay their dues. As an integral part of the agricultural education program, the FFA is a valid area of inquiry. Our research may reveal new information about a puzzling situation; it may help us dispel rumors; or it may help us affirm what we suspect to be true.

If we ask teachers and students to devote their precious time to FFA, we must provide empirical evidence as to the value of this experience. Student teachers and beginning teachers are particularly interested in information that helps better prepare them for advising their chapters. Are the benefits educational, social, psychological, or political? Why enroll in agriculture and join FFA? Answers to these questions and many others need to be sought and shared with the profession. Most importantly, information that can make a difference in how we effectively use FFA as a classroom tool must be communicated to those who make a difference—classroom teachers who are the FFA advisors.

Research Sources

Research is the pursuit of knowledge. Those seeking answers to FFA questions include university faculty, graduate students, administrators, teachers, FFA members, National FFA staff, foundation sponsors, business and industry, and community members. Recently, research firms have conducted FFA research in cooperation with agricultural educators. Numerous research designs and instruments have been used to collect information. For example, we gather data with mailed questionnaires, telephone surveys, car window surveys, magazine readership cards, focus groups, and personal interviews.

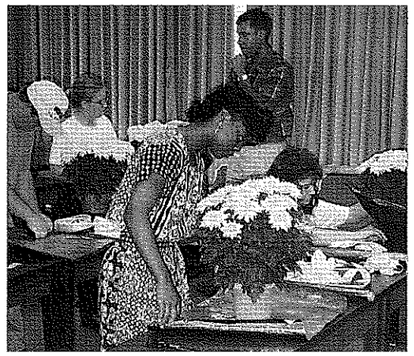
The FFA is that classroom tool often used to meet affective domain objectives—to help students develop leadership, citizenship, cooperation, responsibility, and scholarship. It is not easy to measure effect when there are so many other influences on student development. We primarily rely on self-reporting, assume honesty in the answers, and are careful in our generalizations. Researchers have developed formulas in order to calculate participation scores permitting more sophisticated analyses. Repetition and the use of qualitative, as well as quantitative, methods have strengthened our research. Over time, trends have emerged from our research giving us more confidence in the results. An exception can always be found somewhere, but for the most part, we are confident that the recommendations hold merit.

Doctoral research represents an important contribution to the FFA knowledge base. However, between 1906 and 1986, only 24 (slightly over 2% of the 970 agricultural education dissertations) focused on FFA issues (Moore, 1987). Since 1986, eight more doctoral dissertations have been completed focusing on FFA issues such as recruitment, the relationship between advisor attitudes and proficiency award recognition, contests and career aspirations, and leadership skills and styles. Recently, master's theses, university staff studies, and National FFA Organization-sponsored research have generated important, timely information.

Applying What We Know About the FFA

Leadership

Active participation and leadership opportunities should be encouraged, because student leadership traits are enhanced by participation in FFA activities. Those activities should be many and varied (Carter & Townsend, 1983). Leadership opportunities exist, regardless of school or FFA chapter size, number of teachers, or size of community (Malpiedi & Voth, 1984). Community leaders confirm that the vocational agriculture/FFA experience had a positive impact upon their lives (Brannon, 1988). In North Carolina, the current governor, superintendent of public instruction, numerous legislators, and business leaders admit that agricultural education and FFA contributed to their careers by helping them develop self-confidence and speaking abilities. Every state has similar leaders who continue to loyally support FFA. Quality leadership instruction pays benefits.



Horticulture contests are not just for girls. FFA needs to make opportunities available for a diverse membership.

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Science-related activities are of interest to FFA members.

Contests and Awards

One of the reasons students join FFA is to participate in its activities (Marshall, Herrin & Briers, 1990). Contest participation develops interpersonal benefits (Gamble, 1981). Dormody and Seevers (1994) shed interesting light on participation. In predicting youth leadership life skills development scores (YLLSDS), achievement-oriented FFA members, or those who seek challenging activities, scored higher than others. So, if contests are to be meaningful experiences, they need to include challenge and a balance of cooperative, competitive, and personal growth opportunities.

The National Contest Study (Blakely, Holschuh, Seefeldt, Shinn, Smith, & Vaughn, 1993) revealed that students participated in contests and awards because they liked the feeling of winning; they hoped to win prizes; liked to go on trips; enjoyed teamwork; and learned from the contest preparation. Students and adults concurred that classwork and FFA activities were closely intertwined and benefited each other as students learned knowledge and skills in class, and FFA members maintained interest through application and contest practice.

Perceived barriers included: other school activities, after school work, shyness, conflict with part-time jobs, students feeling that they do not fit, parental support, and negative stereotypes. Advisors need to keep these in mind, especially as they try to encourage gender and ethnic equity in contests. Since teamwork and cooperation are valued, contests need to include team and large group activities, in addition to traditional individual activity.

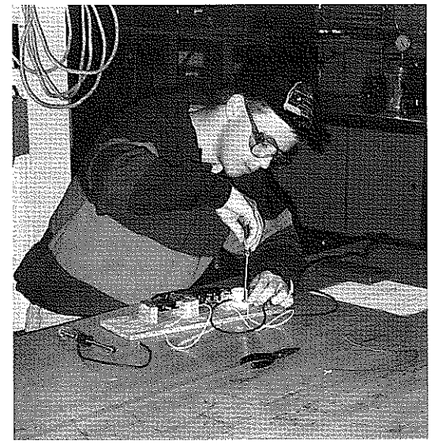
While students believed that the current contests were equally motivating for those with broad agricultural interests, the adult groups did not. Students indicated interest in new contest areas like environmental science, computers, and agricultural chemistry. In preparing students for the year 2000, students believed that the contests should keep current with industry, teach responsibility and leadership, and teach skills for specific careers. It is interesting that the research has shown that students who participate in contests usually have agriculturally related career aspirations but do not necessarily consider career interest as an important reason for selecting a contest area.

The National FFA has proposed 16 new contests with guidelines for future implementation as funding becomes available. Recognition for all participants must be addressed at the local, state, and national level. Forms of recognition need to include plaques and trophies, articles in the newspaper, recognition at local banquets, and recognition from family and friends. Recognition helps build student self-esteem and program image.

Recruitment

Program image is crucial for recruitment (Blakely, et al., 1993; and Rossetti & McCaslin, 1992). Recruiting from middle schools poses a slightly different challenge than recruiting at the high school level. Middle schoolers are greatly influenced by the image of the program and by the agriculture teacher. Also, hands-on activities and FFA activities are important influences on whether a student enrolls in agriculture and belongs to the FFA. In 1992 there were 52,968 middle school agricultural students, but only 33%, or 17,722, were FFA members.

Administrators and counselors are often blamed for students not enrolling in agriculture courses. While schedule conflicts have some influence, primary barriers cited by students include a negative program image and a desire



Students participating in agricultural mechanics/engineering courses often aspire to careers in that area.

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for participating in other activities. The message is clear that if we want to attract students to FFA, we must provide them the program and a better "deal" than what they can get somewhere else. Also, to avoid "burnout" of that continuing FFA member, middle school and high school FFA activities must be very different and present appropriate age-level challenges.

Recruiting at the high school level includes recruiting into the program and into FFA. There are few states who enjoy 100% membership status. Especially now, students may enroll in agriculture but not FFA because of other activities, work, or personal influences. Many students enroll in agriculture because they want to be in FFA, enjoy working outside the classroom, plan on an agricultural career, are interested in pursuing scholarships, and have friends in the program. Parents and friends are more influential on enrollment decisions for female and minority students. Advisors must be sure that opportunities for minority students exist and that these students have the chance to be as successful as others. Females and minority students must feel like they fit, and they must see successful role models.

FFA Publications

Publications are the means for and object of our research. Do you read your FFA *New Horizons* magazine? Conners, Elliot, and Krueger (1993) discovered that 78% of the members and 81% of the advisors read at least 50% of the magazine. FFA members and their advisors frequently read the cover story, features, FFA/career articles, "Chapter Scoop," and joke page. Advisors read "News in Brief," "Looking Ahead," "Front Line," and "My Turn." Articles that are reasonable in length, have pictures, and are of local or personal interest get the most attention.

FFA members are willing to pay more for the magazine if it will offer them more issues and articles, particularly career information. The current distribution system based on membership reporting is a problem. Member copies are often delayed. The magazine is a valuable, respected classroom tool. Knowing that students and advisors find it useful provides more opportunities for disseminating agricultural information.

Summary

In the limited space of this article, it is impossible to reference all the research that has implications for the FFA. The time has come to carefully catalog what we know and to provide a means for updating the profession with new findings. We need to disseminate the information in a pragmatic manner throughout the profession's publications. Teacher education programs need to work closely with the National FFA Organization and state associations to ensure that appropriate undergraduate and graduate courses provide up-to-date, comprehensive FFA information. Summaries of studies should be presented to the FFA Board of Directors by teacher educator consultants. The researchers and the consumers of our research need to talk about what has been found and how it should be used to best benefit our programs.

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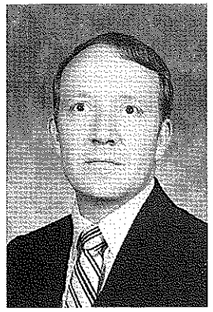
Teaching for Higher Level Cognition in Adult Education Programs



BY LARRY E. MILLER

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The goal of adult education programs should be to encourage learners to solve their own problems or be wise decision-makers. This would be a common goal for adult programs delivered through vocational or extension education. Achieving this goal would call for higher level cognition or critical thinking abilities. Do adult education instructional programs really teach learners to think at these higher levels of cognition?

Work in America has evolved into new organizational structures which are extremely flatted to allow for greater scope of interaction and collaboration among workers having diverse functions and backgrounds. In order to face such frequent and dramatic work and life changes, agriculturalists need to be able to detect, understand, and resolve unfamiliar problems just as would persons in other lines of work. Doing so requires continued learning throughout life and using skills and knowledge flexibly. These challenges are heightening the importance of well-developed cognitive capacities at all organizational levels (Thomas, 1992).

Bloom et al. (1956) proposed a hierarchy for the cognitive domain of learning which represented a continuum from (the simple) knowledge through comprehension, application, analysis, synthesis and evaluation (the complex), and many have defined higher order cognition and critical thinking as the upper four, more complex areas. The question posed by the current research is what are the levels at which we are teaching adults? Specifically, the objectives were to describe the levels at which adult instructors intend to teach and actually teach, and to use selected student and teacher personological characteristics to attempt to explain any variability in the intended and actual levels of cognition.

While much research has been conducted in cognitive psychology, a paucity of studies existed related to adult education. The outcomes could have importance for adult educators, because even if our content is technically correct and appropriate but adult educators are teaching at lower levels of cognition, then they would not be preparing adults to function in the current workplace. Educators need to reflect higher levels of cognition in their objectives, teaching activities, and evaluation methods to improve learning and utility of the instruction.

> *"Educators need to reflect higher levels of cognition in their objectives, teaching activities, and evaluation methods to improve learning and utility of the instruction."*

What's Been Learned?

This article synthesizes four research studies conducted over five years, and examines adult education programs in agriculture and vocational education as delivered by three primary adult education agencies: extension, secondary vocational programs, and agribusiness. Each investigation was a descriptive study and ranged from surveys to ex post facto research with reliable and valid instruments and appropriate designs used. The primary variables investigated were "intended level of cognition," as measured by examination of lesson planning or interviews related to objectives of instruction, and "actual level of cognition," as measured by analysis of the actual instruction. Antecedent variables included personological characteristics of the learners and the teachers which were used to help explain any variability in the primary variables.

Miller and Kitinoja (1992) found that participants perceived that their achievement was relatively high in adult classes and they had a positive attitude toward the content taught in the classes. However, they rated their resources for using the content and other outside influences as deterrents to using the knowledge. Participants only reported "some use" for what they had been taught. Teachers intended to teach, on the average, at the "application" level of cognition, but the actual level of instruction averaged near the "analysis" level. Only one class reached the "synthesis" level of cognition; several reached the "analysis" level but often skipped the application level. Kitinoja and Miller (1989) reported the actual level of cognition at which instruction was delivered averaged higher than the reported intended level. "Use" of the instructional content was featured during teaching with liberal application of slides, video tapes and brochures. They found learners were relatively positive about →

their prior learning experiences, about their attitude toward innovation, and their felt need, indicating they were favorably disposed toward learning. Participants indicated they perceived that they had learned and had a positive attitude toward the instruction and the innovation offered. Learner participation in instructional sessions tended to be high in Extension, secondary agriculture, and agribusiness classes, except for the very specialized courses in pesticide application. Highest levels of "use" of the innovations were reported for the more typical production agriculture instructional areas, with lowest levels in computerized record-keeping and analysis programs which would require the use of expensive computer hardware and software.

Bhardwaj and Miller (1990) found that Extension agents (teachers) had a positive attitude toward the use of educational objectives, saw their use more for evaluation than lesson planning, and those agents with more positive attitudes tended to plan to teach at higher levels of cognition. Bhardwaj (1989) reported that agents with many administrative and other duties tended to have lower attitudes than those without such duties, and those agents who made greater use of resource persons tended to have lower attitudes and taught at lower levels of cognition. Older and more experienced agents had more positive attitudes toward using objectives in program planning than younger and less experienced agents. Agents with pedagogical/andragogical training tended to have more positive attitudes than agents without, but tended to intend to teach at lower levels of cognition.

Miller and Ismail (1993) compared county agents with state specialist (university employees) Extension personnel. Agents and specialists intended to teach primarily at the comprehension and application levels, but actually taught at the analysis, synthesis and evaluation levels. Specialists intended to teach at higher levels than agents, but actually delivered at lower levels than intended, while agents delivered at higher levels than intended. Less experienced agents and specialists delivered instruction at higher levels than more experienced personnel. State specialists with greater proportions of research and resident instruction responsibilities tended to teach at lower levels than those with lesser proportions. Agents with greater administrative and other Extension responsibilities tended to teach at lower levels than those with lesser outside responsibilities. Specialists and agents with technical agriculture degrees intended to teach at higher levels of cognition than those with education or social science degrees, but did not deliver the actual instruction at significantly higher levels (Ismail, 1992).

Squire and Miller (1993) found that adult educators in vocational programs in Central Ohio intended to teach and evaluate at the analysis and synthesis levels of cognition. Those teachers who had participated in seminars or workshops on using educational objectives, which should include consideration of levels of cognition, tended to use them in program planning, in teaching, and in student evaluation. Most teachers indicated that they had studied the use of educational objectives in their teacher certification program, but saw less use for such objectives in the teaching function than in the planning or evaluation functions. Teachers perceived that they were not stakeholders in designing the vocational education programs. They indicated they were not satisfied with the current status of adult vocational education programs, but were optimistic about the future of such programs. Some teachers did not prepare any lesson plans to guide the instructional process. Recommendations were made for teacher educators and supervisory personnel to begin to design preservice and inservice programs to prepare teachers to teach at higher levels of cognition.

Conclusions

These findings brought to light varied information by group and type of program which has implications for practitioners, adult teacher trainers, and program planners in adult education. The intended levels of cognition of the teachers studied tended to average at the application level. The teachers tended to actually deliver instruction at higher levels of cognition than they had planned, however, and were often at the analysis or synthesis levels. Teachers who had received formal training in andragogy tended to intend to teach at lower levels of cognition than those without such training, but actually delivered instruction at higher levels of cognition. Less experienced teachers intended and actually delivered instruction at higher levels of cognition than teachers with more experience.

Application of these findings will have implications for the group studied and perhaps may be indicative of, or generalizable to, other adult education programs and teachers. If so, then teachers need to adjust the level of cognition of objectives, methods of teaching, and evaluation methods used in their instructional programs to accommodate higher levels of cognition. Instruction should do more than just "tell" information by providing methods to help participants learn to think, solve problems, and make decisions. Findings would indicate that more experienced teachers may become less concerned with preparing for and actually teaching, thus, resulting in fewer high-level cognitive activities. Although one could not prescribe an ideal level of cognitive activity for a given lesson topic, the results seem to indicate that higher levels of cognition should be planned for and included in the actual teaching methods.

Those who prepare teachers of adults through preservice and inservice education should also be aware of these results because teachers with such preparation planned for lower levels of cognition than those without such preparation. One

(continued on page 19)

Using Research Findings to Plan a Curriculum

BY JAMES E. CHRISTIANSEN

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Mario, 15, liked doing mechanical things. But, Mario almost didn't take a second high school course in agriculture that fall. He would not have, except for the fact that a new teacher came during the summer—a teacher who opened the mechanics lab on Tuesday and Thursday mornings to help some students with projects, who arranged to take other students on tours of the SAE programs and to visit a few agribusinesses in the community on Wednesday mornings, and who asked Mario to help him get the mechanics lab ready for fall classes. In doing so, Mario discovered all of a sudden that he could run a pretty decent electric arc bead, much better than anything that he had done in his freshman year only three months previously.

Why had Mario not been keen on taking that second course? After all, he was interested in agricultural mechanics, and the previous teacher had spent a lot of time during Mario's freshman year teaching electric arc welding and other skills in agricultural mechanics. In fact, almost 40% of the first year curriculum in agriculture at that school was devoted to agricultural mechanics.

The answer? The class spent three weeks trying to learn to arc weld. They stuck the rod to a lot of metal, and the scrap box was full of practice beads and welds, of which probably 95% were not good. The teacher made it seem so easy when he demonstrated, but Mario and several of the other students never did get the "hang" of maintaining the proper arc length, using an even weaving motion, and keeping a constant speed of travel, even though they were using E-6013 rod on mild steel in a flat position.

But the teacher did not know that most 14- and 15-year-old students have not matured enough physically to have the hand-eye coordination necessary to maintain the proper arc length, the proper weaving motion, and the proper welding speed. If those freshmen had been introduced to brazing instead, where there exists considerably more latitude for "sloppiness" in brazing a satisfactory joint, or had been taught to use a carbon arc rod to solder whereby the rod could be dragged along the metal, thus not creating a problem of maintaining arc length, they would have learned faster, been more pleased with their achievements, been less frustrated, and would have liked the course better.

Better yet, if the teacher had waited to teach "real" arc welding in the sophomore year, just one year later, the students would have had the coordination needed, would have learned faster, and would have been better pleased with their work. This application of research findings would have helped both the teacher and Mario, and made the teaching-learning process both more effective and enjoyable.

What Does This Mean?

While agriculture teachers seek to develop students through the study and application of scientific principles, problems, and activities applicable to agriculture and agriculturally related occupations, they should first of all recognize that students at different ages have different, but definite, physical and emotional needs and desires. The 14-15 year-old students have characteristics and needs different from the 16-18 year-olds, and both groups possess characteristics different from those of 19-24 year-old young adults.

Because of these differences, this article addresses primarily the characteristics of 14 and 15 year-old students to be served, especially in the first two years of agriculture in the secondary school curriculum. In doing so, we examine also the attendant implications for both curriculum content and for effective teaching and learning. This is especially important considering that in 1986, Sedlack, Wheeler, Pullin, and Cusick reported that "... one-third of secondary school students actively resist the narrow, pedantic, and passive curriculum offered to them, an additional one-third resist passively" (Norman A. Sprinthall as reported in Reynolds, 1989, p. 234).

What Do We Know About 14-15 Year-old Adolescents?

1. *They need association with other individuals.*

Implications: Establish group projects. Make group assignments. Instead of sending one student to the lumber yard to get prices of lumber for a class project, send three people, even if they detour to the Dairy Queen on the way.

2. *They can be irresponsible or undependable and may be uncertain in their actions.*

Implications: Make individual assignments that are part of a series of activities needed to complete a group project so that peer pressure is brought to bear if they don't follow through. Plan and carry out activities with specific steps for which exist definite awards for accomplishing or definite penalties for not accomplishing.

3. *They are inclined to be intolerant and dogmatic in opinions and attitudes and to be rebellious against conventions, especially in early adolescence.*

Implications: Involve students in group activi- →

ties with others of different backgrounds. Ask for proof of assertions through individual and group assignments. Engage students in exercises in critical thinking.

4. *They have excess energy and are often self-assertive.*

Implications: Plan interactive class activities with students. Include hands-on activities in both classroom and laboratory settings. Change the pace and nature of class activities every 15-20 minutes.

5. *They are inclined to hero worship and have strong loyalties.*

Implications: Use respected people in the community as resource people for field trips and in-class topics. Establish a system of respected mentors with whom students can work and to whom they can turn as individual problems arise.

6. *They are awkward physically and mentally and are aware of physical changes that often disturb them.*

Implications: Remember Mario? Arrange curricular content at the levels of physical readiness and mental awareness possessed by the students in your classes. Just because something was appropriate one year does not mean that it will be appropriate the following year. Include topics on personal development in the curriculum.

7. *They experience perplexities and need counsel.*

Implications: Schedule times (and give students the schedule) when you as a teacher are available to talk about anything under the sun, either individually or in group settings.

8. *They desire social approval.*

Implications: Give individual assignments that are presented in group settings so that approval from peers is likely to occur. List individual accomplishments in departmental or FFA chapter newsletters, homeroom or intercom announcements, and awards programs. Take photographs and display on bulletin boards. Compliment both verbally and in writing. Inform parents or guardians of students' successes.

9. *They are concerned with the new, fresh, and unfamiliar in experience.*

Implications: Provide demonstrations, use field trips, bring resource personnel to class, and use newspaper and magazine articles.

10. *They desire security. Success fosters it; fear and failure develop a feeling of insecurity.*

Implications: Establish routines in classes (in other words, be predictable). Establish activity and discipline procedures (rules) and follow them. Follow through to completion the teaching of topics that are begun in class (don't skip around).

11. *They desire success and victorious accomplishment.*

Implications: Help students develop and have ownership in productive enterprises in agriculture, get placed in cooperative work settings, and acquire a variety of supervised agricultural experiences. Specify clearly defined course, unit, topic, and daily objectives and show students the progress that they are making through the year.

12. *They need and strive for independence, but may not realize that it must be demonstrated or exercised with reasonable safety.*

Implications: Let students do individual work in the classroom or laboratory, but teach, demonstrate, and give tests on safety regulations. Incorporate units on safety throughout the curriculum.

13. *They need vocational counseling, work experience, and opportunity to develop abilities and to earn an income in one or more vocations.*

Implications: Supervised agricultural experiences, including opportunities to earn money, must be built into the curriculum. Time and topics related to vocational counseling need to be built into the curriculum.

14. *They need time for play and recreation.*

Implications: Show ways by which supervised agricultural experiences may turn into hobbies. Include playful activities in exercises that are designed to develop creativity. Help FFA officers and committees design and incorporate recreational activities in the chapter program of work.

15. *They need a philosophy of life and stimulation and guidance in thinking through their own problems and in forming their opinions and attitudes on important issues.*

Implications: Include "life" discussions in instruction. Use current articles from newspapers and magazines about agricultural issues and incorporate group "position-taking" exercises into teaching-learning activities. Include topics on emerging issues in each unit of instruction wherever possible.

The 15 characteristics and needs listed above were identified years ago by R.W. Cline and W.A. Schafer (1948, p. 4-5) at the University of Arizona. However, there are others that we must consider. Among them are the following:

16. *Adolescents begin to wonder about the kind of world in which they will live for the rest of their lives* (Rhoades and Rhoades, 1980, p. 21).

Implications: Include a unit on "futuring" as related to agriculture in different courses in the curriculum. Include in each unit a topic on "future trends and issues" as it relates to that topic. Use newspapers and magazine articles to enlarge students' horizons about different aspects of agriculture.

17. *They need privacy, a universal need, but they also need interaction with others; consequently, there must be a balance between privacy and interaction* (Heyman, 1978, p. 14).

Implications: Assign individual projects, but also have students participate in group problem-solving activities and group projects. See #1 above.

18. *They possess an ethnic culture and often bring ethnic diversity to the school setting* (Banks, 1977).

Implications: Mix students of different backgrounds when engaged in group activities and projects; rotate students among work groups so as to attain diversity and to minimize the formation of cliques. Use as articles showing aspects of agriculture as conducted in different parts of the world →

among people of different cultures.

19. *They need a chance to feel appreciated, influential, and needed* (Lippitt, 1975).

Implications: Use students in peer-teaching activities and as a way of individualizing instruction. Students learn to act cooperatively rather than competitively. An increase in academic achievement occurs when cooperative learning takes place (Hilke, 1990, p. 25).

20. *They need to be motivated in order to think creatively* (Torrance and Torrance, 1973).

Implications: See #11 above. Engage students in brainstorming activities. Use successful role models as resource personnel to share with students their methods of tackling problems.

What Does It All Mean?

In summary, don't forget Mario. As teachers, we must actively involve students in the teaching-learning process. However, that process must consider the characteristics and needs of students, as well as the nature of the content of the curriculum if the Marios of this world are to learn effectively and efficiently.

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Teaching for Higher . . .

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might argue, however, that these might be more realistic objectives for a given audience. Almost no actual instruction was delivered at the evaluation and very little at the synthesis level. These results would imply that the cognitive abilities developed through the adult education programs were less than those needed in the current workplace. Henderson (1988) noted that adult education programs in agriculture must use the technical content to develop problem solving and critical thinking abilities in participants, but these results do not provide evidence that adult educators are adequately attempting to develop higher order cognition.

Teacher educators and program administrators would do well to begin to assess their preservice and inservice programs related to teaching for higher level cognition. More is being learned all the time from cognitive psychology which can be applied to adult education and help prepare a more "learned" adult ready to solve problems of the real world while simultaneously adding to our theoretical bases. Honest attempts to really improve "learning" must consider teaching for higher level cognition, not just teaching more "things."

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Improving Leadership Development in 4-H and FFA

BY THOMAS J. DORMODY & BRENDA S. SEEVERS

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Introduction

In 1992 we developed a scale to measure youth leadership life skills development among 4-H and FFA members. Miller (1976, p. 2) defined youth leadership life skills development as self-assessed and organization-specific "development of life skills necessary to perform leadership functions in real life." Our scale asks youth to assess their development of 30 different leadership life skills while a member of 4-H or FFA. These skills fall into seven areas: communications, decision-making, getting along with others, learning, management, understanding yourself, and working with groups. In our opinion, the scale has some skills that fit within the traditional "industrial construct" of leadership (e.g., leadership is the ability to influence others to achieve set goals) and others that fit within the "emerging" or collaborative paradigm of leadership (e.g., "leadership is a process of combining the ethics of individuals into the mores of a community") (Barker, 1994, p. 51).

After pilot testing the scale, it was used in parallel 4-H and FFA research studies. The primary purpose of the studies was to determine if members' participation in leadership activities predicts their leadership life skills development. The studies also sought to describe 4-H and FFA members' perceptions of which leadership activities contributed most to leadership life skills development and to what extent they participated in planning, implementing, and evaluating those activities. Questionnaires were mailed to 400 4-H and 400 FFA members from Arizona, Colorado and New Mexico. Close to 60% of those surveyed in each organization completed a questionnaire.

Summary of the Results

Leadership in 4-H

Four variables—participation in 4-H leadership activities, ethnicity, achievement expectancy, and gender—were predictors, explaining close to 20% of the variance in leadership life skills development scores. Participation in 4-H leadership activities had a positive relationship with leadership life skills development, and by itself explained close to 13% of its variance. Additionally, minority members and female members had slightly higher leadership life skills development scores than non-minority and male members, respectively. Eighty percent of the variance in leadership life skills development scores was left unexplained by the four variables.

Over half the 4-H members participated in fairs, demonstrations, teaching younger members, community service projects, holding office, committees, livestock shows, judging contests, and public speaking. Overall, participation was greatest at the club and county levels. However, over half the fair participants went to the state fair. Activities identified by over 50% of the participants as top leadership development activities were holding office, teaching younger members, judging contests, Citizenship Focus, and ambassadors. 4-H members were most likely to participate during the implementation phase (92%) and less likely to participate in the evaluation (62%) or planning (49%) phases of their top leadership development activities.

Leadership in FFA

Three variables—achievement expectancy, participation in FFA leadership activities, and gender—were predictors, explaining almost 17% of the variance in leadership life skills development scores. Achievement expectancy, or a combination of the level of evaluation FFA members expect from others and the level of performance they expect from themselves in FFA activities, explained almost 14% of the variance. Participation in leadership activities was a much weaker predictor of leadership life skills development for FFA members than for 4-H members. Female FFA members had slightly higher leadership life skills development scores than male members. Over 80% of the variance in leadership life skills development scores was left unexplained by the three variables.

Over half the FFA members participated in chapter meetings, fundraising, chapter banquet, judging contests, committees, parliamentary procedure, public relations, and SAEP. For activities offered at and above the chapter level, 66% of the time participants did not advance beyond the chapter level. However, 88% of the members who participated in judging contests advanced beyond the chapter level.

Judging contests, public speaking, holding office, and the Washington Conference Program were cited by over half the participants as top leadership development activities. As with 4-H, FFA members were most likely to participate during the implementation phase (85%) and less likely to participate in the evaluation (67%) or planning (48%) phases of their top leadership development activities.

→

Turning Research Into Practice

The correlational research design used in these studies does not allow us to say with confidence that increasing a 4-H or FFA member's participation causes increased leadership life skills. We can say with more confidence that participation helps predict or is related to leadership life skills development. Even if we would take a great leap of faith and entertain thoughts of cause and effect, we could only say that increased participation is causing small increases in leadership life skills, particularly for FFA members.

Some agricultural education professionals will interpret the prediction results in a positive light (i.e., that significant relationships between participation and leadership life skills development in both 4-H and FFA support the value of the programming). Others will focus on the strength of the relationships. If we focus on strength, there appears to be room for improvement in both organizations.

One way to strengthen the relationships between participation and leadership life skills development in 4-H and FFA in the three states would be to design new or redesign existing activities that teach the desired skills more fully. A second way would be to encourage participation in activities that are effective in developing leadership life skills.

Finally, 4-H advisors, volunteer leaders, and agriculture teachers should involve members in planning and evaluating leadership development activities more fully. Planning and evaluating are skills the members will use all of their lives. If we compare the activity planning phase to a problem-solving model, they have a lot in common. When we do all of the planning for our youth, they lose opportunities to identify and define problems, gather information, identify alternative solutions, and select the best alternative. Evaluation is not only the final stage in problem solving, it is the highest level of cognition in Bloom's taxonomy. Students lose opportunities for developing critical thinking skills if we evaluate leadership development activities for them.

A way to ensure that youth are involved in planning, implementing, and evaluating leadership development activities is to adopt the "program of work" or "program of activities" concept. With this approach, standing and special committees plan, implement, and evaluate organizational activities. In FFA a purpose of the program of activities (POA) is to provide every member with leadership development opportunities. However, only 20% of the FFA members said they had participated in POA work and only four of 220 members thought it was a top leadership development activity. This could partially explain why they were much less likely to plan or evaluate than to implement leadership activities. The profession should re-emphasize the POA concept. Adoption can be encouraged by providing curriculum and instructional materials, and preservice and inservice education for agents, volunteers, and teachers.

As part of their POA training, professionals and volunteers should be taught how to teach collaborative leadership. Youth won't learn to collaborate just because they are put on committees. Our youth should participate in activities where they learn the collaborative leadership skills they will apply during committee work. The problem-solving environment sought for collaboration will necessitate developing trust-building skills and behaviors like self-disclosure, active listening, managing agreement through consensus, sharing leadership and responsibility, mutual respect, and self-monitoring. Conflict will naturally arise during committee work. Therefore, conflict resolution methods should also be taught. If handled correctly, conflict is a force for change and a source of synergy (when the solution becomes greater than the sum of its parts).

Future Directions

Certainly the results of our research cannot be generalized to all states, and further research along these lines should be conducted. However, because the concept of leadership is evolving, we can begin to ask ourselves if our agricultural education youth organizations are developing leaders for the 21st century. If the answer is "no" or "not completely," we can initiate improvement by first agreeing on the way we conceptualize "modern leadership." Should we subscribe to the industrial construct or the emerging paradigm of leadership? Is General H. Norman Schwarzkopf (Wren, 1994) correct in saying that leadership is situational and therefore difficult to define? If so, we may want to consider a variety of leadership paradigms and the skills they suggest, stressing situational application.

And what about leadership and management? Are they different functions requiring different skills to master? Barker (1994, p. 50) says "the function of leadership is to create change while the function of management is to create stability." Certainly tomorrow's professional will need to be able to wear both leadership and management hats. However, we would challenge our profession to look at how many of the leadership activities in agricultural education today emphasize the development of skills that fall under a modern management paradigm.

Recently, National Public Radio carried stories about Ford Motor Company and Boeing and their successful collaborative leadership approaches. These companies are finding it takes less time from conceptualizing to marketing new models, and the new models have fewer

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Instructional Technology

BY WESLEY E. BUDKE

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Locating agricultural education curriculum materials can be frustrating and time-consuming. There is the temptation to return time and time again to sources near at hand. Although these sources may have proven adequate in the past, we should be ever alert for alternative sources, many of which serve all of vocational education. In the next few paragraphs you will be introduced to the alphabet soup (NNCCVTE, SLR, CCC, V-TECS, MAVCC, AAVIM) of vocational education curriculum networks, centers, and consortia. For some, these networks, centers, and consortia may already be a part of your scanning screen. For others, this may be an introduction to valuable new resources.

Curriculum Coordination Centers and State Liaison Representatives

The National Network for Curriculum Coordination in Vocational and Technical Education (NNCCVTE) is made up of six regional Curriculum Coordination Centers (CCCs) and a network of State Liaison Representatives (SLRs). SLRs serve as a link between the education community of a particular state and the regional CCCs and are often on the staff of the state department of vocational education's curriculum materials center. In addition to serving educators in their state, SLRs are often curriculum developers. The materials that they produce and distribute in their state might be accessible through the CCCs, consortia members, and the ERIC database. They may also be available through one of the consortia discussed here or through a state learning resource center. The SLRs, one in each state and territory, provide educators with information about previewing or obtaining curriculum materials and can assist in the development of curriculum and instructional materials. Although specific services vary from state to state, in most instances an educator can call the SLR to assist in locating vocational education curricula. Many states have extensive catalogs of instructional materials, both print and non-print. If an appropriate curriculum is not available, the SLR will call the regional CCC to find one. The CCC will send a loan copy, if available, and/or will do an ERIC search to try to find the needed materials. One of the advantages of borrowing curriculum from your regional CCC is that it provides an opportunity for reviewing and evaluating materials before purchasing them. To identify the SLR in your state, contact your state department of education or your regional CCC.

Northeast Curriculum Coordination Center, New Jersey Department of Education, Division of Academic Programs and Standards, Office of Adult and Vocational Education, Crest Way, Aberdeen, NJ 07747 (201) 290-1900 — FAX (908) 290-9678. (CT, MA, ME, NH, NJ, NY, PR, RI, VI, VT)

Southeast Curriculum Coordination Center, Mississippi State University, Research and Curriculum Unit, P.O. Drawer DX, Mississippi State, MS 39762 (601) 325-2510 — FAX (601) 325-3296. (AL, FL, GA, MS, NC, SC, TN)

East Central Curriculum Coordination Center, K-80, Sangamon State University, Shepherd Road, Springfield, IL 62794-9243 (217) 786-6173 — FAX (217) 786-6036. (DC, DE, IL, IN, MD, MI, MN, OH, PA, VA, WI, WV)

Midwest Curriculum Coordination Center, Oklahoma Department of Vocational-Technical Education, 1500 West 7th Avenue, Stillwater, OK 74074-4364 (405) 743-5423 — FAX (405) 743-5142. Internet: VOTEMAH@osucc.bitnet (AR, IA, KS, LA, MO, NE, NM, OK, TX)

Northwest Curriculum Coordination Center, Clover Park Technical College, Building 15, 4500 Steilacoom Blvd., SW, Tacoma, WA 98499-4098 (206) 589-5764 — FAX (206) 589-5503. (AK, CO, ID, MT, ND, OR, SD, UT, WA, WY)

Western Curriculum Coordination Center, University of Hawaii, Wist Hall 216, 1776 University Avenue, Honolulu, HI 96844-0001 (808) 956-7834 — FAX (808) 956-3374. Internet: 1zane@uhunix.uhcc.edu (AS, AZ, CA, GU, HI, NV, CNM, FSM, ROP, Rep. Mar.)

State Vocational Education Resource Centers

The state vocational education resource center may or may not be the home of the SLR. Some resource centers are maintained as a library of vocational education materials. In addition to curricula, they may house collections of audiovisual materials and resource material valuable to vocational educators. They may also provide services such as curriculum development workshops, in-service workshops, program evaluation, publication sales, newsletters, or technical assistance. They often maintain an electronic bulletin board for their state and conduct computer searches of the ERIC database. Centers are usually funded by the state department of vocational education; call your state department, SLR, or regional CCC to identify centers in your state. →

Consortia

In addition to the vocational curricula that are available through ERIC, a State Liaison Representative, a state vocational education resource center, and the regional CCCs, there are various consortia and commercial producers of instructional and research materials. These agencies offer a variety of types and formats (e.g., task lists, competency-based materials, videos, computer software, position papers) in all areas of vocational and technical education. Contact the agencies for their current product catalogs.

Vocational-Technical Education Consortium of States (V-TECS), 1866 Southern Lane, Decatur, GA 3003-4094 (404) 329-6543.

The purpose of V-TECS is to promote the systematic development and implementation of competency-based vocational and technical education by securing the active participation of state departments, vocational and technical education agencies, and other organizations, in the analysis of jobs and the organization of job-related information; the development of vehicles for assessing student achievement; and the design, development, or acquisition of instructional materials that provide a validated link between education and employment.

V-TECS offers catalogs that include worker tasks, tool and/or material lists, information on how to perform those tasks, and the standards of component task performance. All components are validated by workers in the specific occupation. V-TECS curriculum guides include units of instruction that complement the V-TECS catalogs with the support knowledge needed for task performance, learning activities, performance evaluation, and student information. Materials are developed by instructors and workers in the particular occupation.

V-TECS also has criterion-referenced test items and offers customized in-service programs, workshops, seminars, and technical assistance. It maintains a network of professionals who can meet the demands of a particular program.

Mid-America Vocational Curriculum Consortium (MAVCC), 1500 West 7th Avenue, Stillwater, OK 74074-4364 (405) 377-2000.

MAVCC, an organization of 10 states, develops competency-based instructional materials mutually needed by those states. Publications are for sale to anyone. MAVCC also develops competency-based curriculum guides that provide instructors with a valuable tool for better lesson planning, classroom instruction, evaluation of student progress, and testing for program accountability. The guides include lists of objectives, suggested activities, information sheets, transparency masters, assignment sheets, job sheets, unit tests, and answer sheets. MAVCC develops printed materials, audiovisual materials, and computer software.

American Association of Vocational Instructional Materials (AAVIM), 220 Smithonia Rd., Winterville, GA 30683 (800) 228-4689.

AAVIM products provide students, teachers, and administrators with up-to-date training practices and procedures. Modules, guides, and tests are designed for group and individual use. AAVIM produces an array of print and audiovisual materials and computer software in all areas of vocational and technical education. Their competency-based administrator education (CBAE) materials are an approach to the preparation and professional development of vocational-technical leadership personnel. The performance-based teacher education (PBTE) materials are an approach to instructor preparation that requires demonstration of essential teaching tasks in an actual teaching situation. They are designed for preservice and inservice training of secondary and postsecondary vocational and technical educators.

There are many other vocational education curriculum centers and consortia that are valuable agricultural education resources, but there are too many to highlight in a short article. For additional information, refer to the directories cited below.

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Leadership Development . . .

(contined from page 21)

defects with collaborative leadership. Are we reflecting leadership trends in agricultural education? Let's start the dialogue.

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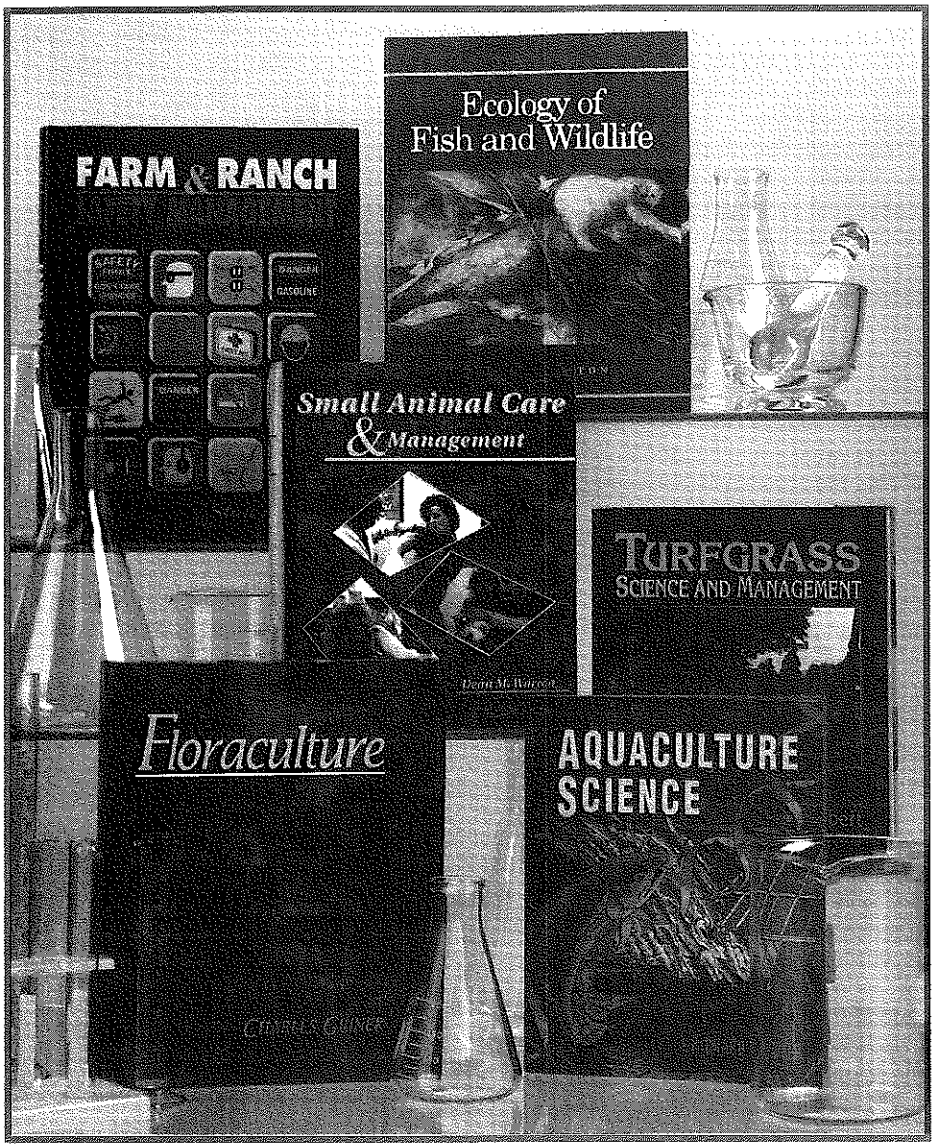

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