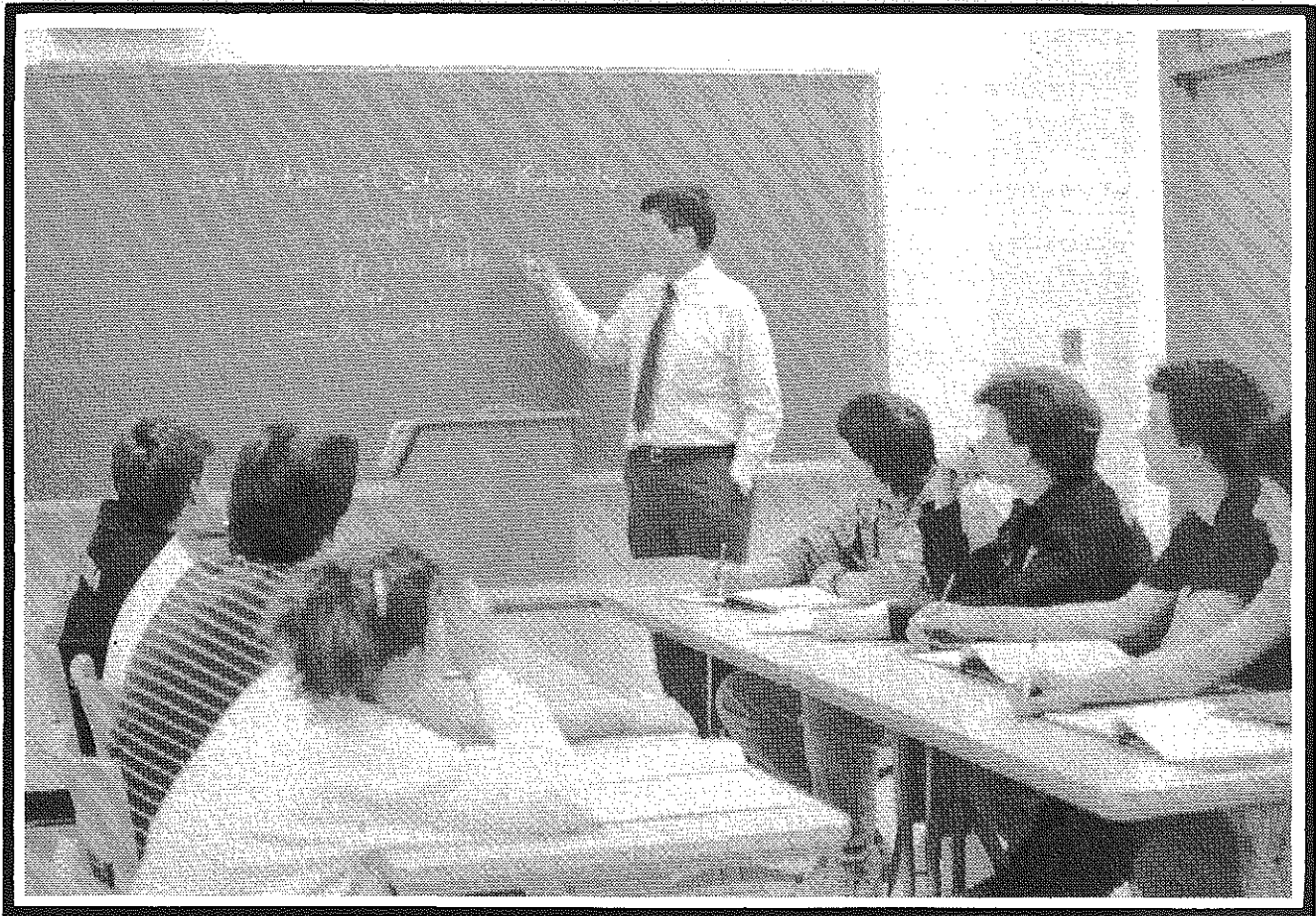


*The*

# Agricultural Education

September, 1989  
Volume 62  
Number 3

Magazine



**THEME: Focus On Teaching**

# THE AGRICULTURAL EDUCATION MAGAZINE



September, 1989

Volume 62

Number 3

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## Table of Contents

	Page
<b>EDITOR'S PAGE</b>	
Importance of Teaching . . . . . <i>Phillip R. Zurbrick</i>	3
<b>THEME: Focus On Teaching</b>	
Teaching Deserves Our Focus . . . . . <i>David E. Cox</i>	3
Effective Teaching Requires Marksmanship . . . . . <i>Glen E. Shinn</i>	4
Ten Essential Elements to Problem Solving . . . . . <i>Harry Boone</i>	5
Teaching: Building a Climate for Success . . . . . <i>David Spotanski &amp; Martin Frick</i>	7
A New Era In the Classroom: The Economics of Agriculture . . . <i>Stan J. Bevers &amp; Fred J. Ruppel</i>	8
Student Behavior Problems . . . . . <i>Pierce Faragher</i>	10
Excellence: The Teacher Makes the Difference . . . . . <i>Tony Brannon &amp; Wes Holley</i>	12
Using Personal Warmth . . . . . <i>Eddy Finley</i>	15
Brighten Up Your Laboratory . . . . . <i>David Drueckhammer</i>	16
Protection From Hearing Damage . . . . . <i>Glen M. Miller</i>	17
<b>ARTICLE</b>	
Super Teacher! . . . . . <i>Thomas L. Grady</i>	19
<b>FEATURE COLUMNS</b>	
Agricultural Mechanization . . . . . <i>Joe G. Harper</i>	20
<b>STORIES IN PICTURES</b> . . . . .	24

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# Importance of Teaching

As the official publication of the agricultural education profession it seems appropriate that an issue be devoted to teaching. Further, the month of September represents the beginning of the traditional school year and therefore it seems an appropriate month to devote to the teaching theme. It is our plan to annually devote the September issue of *The Agricultural Education Magazine* to a teaching theme. It is our hope that the emphasis upon teaching will encourage all of us to rise to the occasion and renew our efforts to do an even better job of teaching.

It is said that we all know how to teach better than we demonstrate. It is easy to get in a rut with our teaching. We are tempted to use the same lesson plans, tests, visual aids and build the same projects year after year. After all, we know they work and it is easier to revise slightly than it is to create new ones!

Dr. Floyd G. McCormick, former Head of the Department of Agricultural Education, University of Arizona often asks the question, "Why do teachers, once they learn the system, quit teaching?" I suspect the answer varies for each



By Phillip R. Zurbrick, Editor

(Dr. Zurbrick is Professor and Acting Head, Department of Agricultural Education, The University of Arizona.)

individual and few teachers would acknowledge that they have, in fact, quit teaching. What is perceived as "quitting" is failure to revise and up-date curriculum; failure to prepare or revise lesson plans; and a general lack of enthusiasm for the job. As teachers, we must retain our enthusiasm for both what we teach and who we teach. It is crucial that effective teachers remain "green and growing and not become ripe and rot." What are you doing to rekindle and demonstrate your enthusiasm?

# Teaching Deserves Our Focus

Welcome to the first, of what promises to be an annual, issue of *The Agricultural Education Magazine* dedicated specifically to "Focus on Teaching". It is appropriate for the bellwether publication in our profession to dedicate one issue annually to the improvement of the science and art of teaching. It is to that worthy purpose — teaching — which all of us in the profession are dedicated. The foundation of the profession of agricultural education is teaching. The act of teaching, which is performed daily by teachers of vocational agriculture across the country, is the sole purpose for the entire infrastructure of our profession. The role of supervisors and teacher educators is to support and assist those who teach and to prepare future generations of teachers.

The use of the term "teaching" as a part of the theme for this issue conjures up a variety of images in our mind. Each reader has a mental picture and ready definition of terms such as teaching; to teach; and teacher. It would be interesting if we could compare those mental pictures and definitions to see the degree of similarity. I would guess that great diversity exists, even in our profession, in those mental pictures and definitions. Maybe someone will make those comparisons one day.

Some schools of thought say that teaching is an art — a gift some possess and others don't. Others believe that teaching has a basis in science and that effective teaching consists of certain behaviors which can be identified and replicated. Still others believe that teaching can be "done" by anyone who possesses a body of knowledge (subject matter) in some field. The truth, when it is found, probably rests somewhere in all three.



By David E. Cox, Theme Editor

(Dr. Cox is Associate Professor, Department of Agricultural Education, The University of Arizona.)

As professional educators, we have the opportunity as well as the obligation to remain current in our field. However, what is "our field", in which to remain current? Historically, as teachers of vocational agriculture, we have kept current with the technology of agriculture, but have we kept current with our primary profession — teaching? It is relatively simple for us to remain current in the latest varieties, agricultural chemicals, regulations, machinery, techniques, cultivars, and cultural practices. But, when was

(Continued on page 21)

## About the Cover

Evaluation of the Results: Students at Greenbrier East High School, Lewisburg, WV., are using their SAE records to evaluate the solution to a problem. Woody Hanna, instructor, and his production agriculture students will use student records to determine if a satisfactory solution to the problem was reached. Photo courtesy of Harry Boone.

# Effective Teaching Requires Marksmanship

The value of marksmanship and good teaching has been recognized. I have a friend that is a real sharpshooter. He has a gun for every occasion; a squirrel rifle, a deer rifle for bush, a rifle with a scope for open country, and a dozen others. Would you believe he has a special rifle just for the back window of his pickup? As teachers, you and I have a dozen ways to improve our teaching effectiveness. We have an opportunity to choose from among presentation, student verbal-interaction, and application methods, and couple the lesson with electronic technology. Our teaching success, that is our marksmanship, continues to hinge on the effective selection and use of teaching tools, not shooting from the hip.

## What is Effective Teaching?

Effective teaching requires two basic groups of skills and competencies. Mish (1987) defines teaching as "to cause to know a subject; teaching applies to any manner of imparting information or skill so that others may learn" (p.1209). The first group of skills deals specifically with the mastery of the subject matter and the understanding of its nuances. The second group focuses on teaching skills and student management.

Many argue the merits of one group of skills over the other. Grossman, Wilson, and Shulman (1989) conclude that "the ability to transform subject matter knowledge requires more than knowledge of the substance and syntax of one's discipline; it requires knowledge of learners and learning, of curriculum and context, of aims and objectives, of pedagogy. It also requires a subject-specific knowledge of pedagogy" (p.32).

## Can You Recall the Best Teacher You Have Known?

Five characteristics of an effective teacher are identified in the literature. Effective teachers are clear and easy to understand. These teachers use a variety of techniques and activities in the classroom and laboratory. They are enthusiastic and involved with both the student and the subject matter. Effective teachers are task-oriented, encouraging the student to work hard and do creative work. Finally, these teachers provide students with the opportunity to learn high priority materials, and they evaluate student learning based on the pre-specified objectives (Rosenshine and Furst, 1971).

## What Are the Characteristics of Your Successful Students?

Successful students usually aim high and work hard. As teachers, we should encourage students to establish high aspirations, and to allocate adequate time for learning. Aspiration was a key variable in predicting academic success of students on a follow-through study of the high school class of 1972 (Rudolph and Yoder, 1987). John Carroll (1963) made popular a very simple observation; the amount of learning is directly related to the amount of time the student



By Glenn C. Shinn

(Dr. Shinn is Professor and Head, Agricultural Education Department, Clemson University.)

spends on the task. Brophy (1987) concluded that "students are more likely to want to learn when they appreciate the value of classroom activities and when they believe they will succeed if they apply reasonable effort" (p.40).

Shulman (1986) identified five variables which explain the amount learned by students. Ability, aptitude, and perseverance are three variables which teachers have limited success in changing. However, teachers have control of the other two; providing an opportunity for the student to learn, and the quality of our teaching.

## What Techniques Improve Teacher Effectiveness?

*Teacher expectation.* Our expectations for individual students are important. Kerman (1979) observed that students in the same classroom are very often treated differently, and the teacher may be unaware of differences. Students with poorer learning histories are called on less, thus they are given less opportunity for involvement. Often their responses are treated more negatively by teachers. Gradually, the students become less involved and feel less valued. Teacher expectation is also associated with legitimate praise and criticism.

Kerman found many teachers have rational explanations of the differential treatment; a desire not to embarrass the low achievers, and to allow higher achievers to talk more in order to bring out more nearly correct ideas. Regardless of the logic, low expectations result in low achievement. As teachers, we can improve instruction with a simple frequency chart, and a renewed awareness of the importance of our expectations.

*Advanced organizers.* There is evidence that advanced organizers were originally based on the "Aggie 3-Step Principle": (1) tell them what you're going to tell them, (2) tell them, and (3) tell them what you told them. David Ausubel's (1963) work found when advanced organizers were used students had much greater retention of the subject matter. When average students use advanced organizer techniques, their level of mastery compares to the 90th percentile students who do not have access to the technique.

*Questioning.* Finn (1986) recognized the importance of questioning in the tool box of the effective teacher. Rosenshine and Furst eluded to the importance of clear questions

(Continued on page 6)

# Ten Essential Elements of the Problem Solving Approach

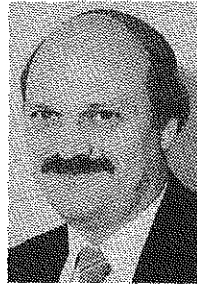
The problem solving approach has been widely accepted as the way to teach vocational agriculture. Variations of the problem solving approach have been recommended by various authors of agricultural education textbooks (Lancelot, 1944; Stewart, 1950; Hammonds, 1950; and Newcomb, McCracken, and Warmbrod, 1986). John Dewey, an educational philosopher, identified a six step learning process which offered the framework upon which the problem solving approach has been developed. The learning process was a scientific method of teaching which combined ideation with overt muscular acts. Dewey's six step learning process, also known as Dewey's steps in Reflective Thinking, *The Method of Science, The Learning Process, and The Scientific Method*; parallels the Six Step Problem-Solving Approach to Teaching identified in *Methods of Teaching Agriculture* (Newcomb, McCracken, and Warmbrod, 1986). The six steps in Dewey's Steps of Reflective Thinking are: 1) experiencing a provocative situation, 2) defining the problem, 3) seeking data and information, 4) formulating possible solutions, 5) testing proposed solutions, and 6) evaluating the results.

Why has the problem solving approach to teaching been so widely accepted as the method for teaching agriculture? What makes the problem solving approach unique to teaching high school vocational agriculture students? There are several factors which contribute to this uniqueness. These factors hinge upon the use of the scientific approach to teaching.

## Experiencing a Provocative Situation

Instruction using the problem solving approach is organized around real solvable problem statements. Real problems provide for direct involvement of the students in the lesson. The instructor takes a provocative situation and presents it in such a way that the students personally feel they need to learn more about the situation. The fact that the situation has a more personal appeal to the students gives the students motivation to learn and to inquire into the situation. The teacher has developed a felt-need-to-know in the students. Some possibilities that teachers may use to create the necessary provocative situation are:

1. Raising perplexing questions.
2. Showing specimens or samples such as a dead animal or a broken part.
3. Presenting a case study in which a job to be done is outlined and then students are asked to explain how to do the job.
4. Giving a skillful demonstration.
5. Showing pictures of success and failure — good or bad.
6. Giving a project assignment.



By Harry Boone

(Dr. Boone is Assistant Professor, Department of Vocational Education, University of Kentucky.)

7. Conducting a provocative role play.
8. Giving a computer exercise to complete.  
(Newcomb, McCracken, and Warmbrod, 1986, p. 69)

## Defining the Problem

The teacher explores and develops provocative situation with the students through a variety of well designed questions. The students identify goals they hope to achieve by studying the problem. By exploring the problem area and establishing goals for the situation, the students develop a clear-cut statement of the problem. The students complete the definition of the problem by developing a list of problems or questions to be answered in solving the problem. The teacher is able to accomplish this with the class by skillfully using leading questions in a group discussion.

Once the problem has been clearly identified, the students then discover information necessary to formulate possible solutions to the problem. The students participate in activities designed to seek data and information such as a supervised study period. During the supervised study period, the students will find and interpret information needed to analyze potential solutions to the problem.

## Formulate Possible Solutions

Each student will take the new information and data and attempt to arrive at possible solutions to the problem. Each solution must be a potential answer to the problem and must be clearly and properly stated.

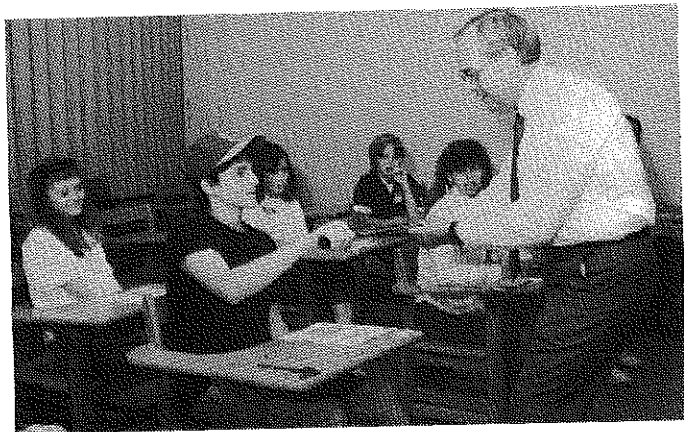
Once the students establish potential individual solutions to the problem, the teacher should organize the instruction utilizing a large group discussion. Each student will present their potential solutions to the problem. Through a well planned questioning strategy the students and teacher establish a group of factors which must be considered in accepting a possible solution.

(Continued on page 18)

## Effective Teaching Requires Marksmanship

(Continued from page 4)

framed from a real word problem. Questions should be sequenced beginning with basic knowledge and move the learner into higher levels of analysis and evaluation. Hopefully, none of your questions fall into the classification system my students have developed: "Guess what Shinn's thinking!"



Effective teachers are enthusiastic and involved with both the student and the subject matter. Often, teachers and students learn together about complex relationships such as torque and speed. (Photo courtesy of Lloyd Blanton).

The effective teacher should carefully frame the question based on the cognitive objectives of the lesson. If the objective is designed to develop knowledge, the question should ask what, who, or when? If the objective calls for evaluation by the student, the question should illicit value judgements and comparisons to standards. Finn concluded that "student achievement rises when teachers ask questions that require students to apply, analyze, synthesize, and evaluate information in addition to simply recalling facts" (p.38).

**Wait-Time.** Classrooms are often characterized by choppy statements or questions by teachers and students that are packed into periods of instruction. A rapid-fire lecture technique leaves students behind and locks them out of active class participation. Students are often lost as they attempt to catalog information and store it into short-term memory.

The wait-time technique provides a brief interval for each student to analyze the materials. It is a secondary benefit that more students are involved in the lesson. Research is seldom practical enough to suggest nominal amounts of time required to respond to a typical question. Experience would suggest ten to fifteen seconds of wait-time will involve most of the learners in the problem. Often because of this increased involvement, questions arise from class members and clarifications will be made by other students.

### How Can I Map a Teaching Strategy?

Variety is the spice of life, but variety in teaching should be based on sound decisions. The faculty of the USAF Air University from Maxwell Air Force Base (AL) developed a decision table (see Table on page 23) that provides sound recommendations to help map a strategy. Based on the objectives of the lesson, the teacher can identify the domains

and levels that are appropriate as student outcomes. For example, if the lesson goal is to develop comprehension, four teaching techniques are highly recommended.

Look at the decision table from another perspective. If each lesson culminates in an application-level activity, students are more likely to develop higher level cognitive, affective, and motor skills. The decision table also examines the expertise of the teacher. Substantial teacher expertise is required to manage application-level activities.

### How Can I Organize an Effective Classroom Lesson in Six Easy Steps?

In order to develop the lesson and incorporate purposeful variety, the following sequence has been successful. Begin each lesson with a succinct review of key points of the previous activity. This can be done by the teacher, or by a "listening team" of students. As a second step, follow the review with the objectives of the current lesson. The third step uses a brief interest approach to focus on the utility of the materials for the student in today's world. The fourth step identifies the problem, collects information, and involves the student in an examination and analysis of key points and relationships necessary for solutions. The fifth step includes a summary of the lesson linked to conclusions and recommendations by the teacher. The sixth, and often overlooked step, is a privileged view of the next lesson. This organizational step will allow motivated students to make advanced preparation for the next learning activity.

### Summary

The selection of teaching techniques is a deliberate choice to target the needs of the student. Techniques should not be chosen for the same reasons that a farsighted hunter chooses a shotgun; to compensate for poor marksmanship. As we learn more about learning and teaching, we likely will move away from the approach which Jerry Clower called for when confronted with a wild cat; "just shoot up in here amongst'st us, one of us has got to have some relief!"

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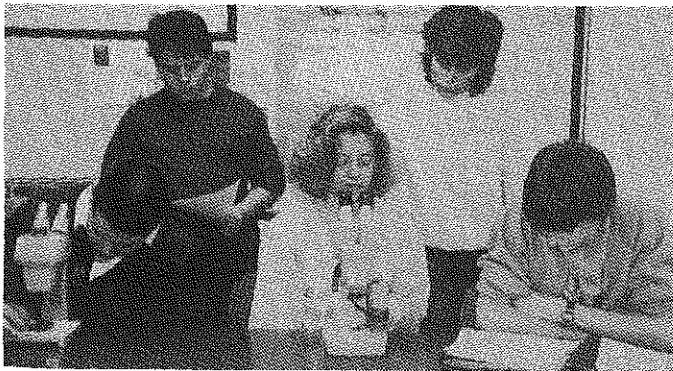
# Teaching: Building a Climate for Success!!

Conduct a brief survey in your classes or school and ask students to identify the highlights of your program. Do students identify the accomplishments of the FFA? Do they indicate the field trips and activities included in the program? Or, do they identify the variety of things students learn in the program as the highlight? If the majority of the responses do not relate to the last question it may be time to establish a new climate.

The climate referred to in this article are the affective aspects of your program, such as the feelings generated by and about the teacher, the students, or the subject matter, along with aspects of the classroom/laboratory itself which contribute positively or negatively to the learning atmosphere. Student perceptions can provide a good indication of the student's expectations for your program. The problem may arise when student perceptions do not represent the purpose of the program.

The agriculture instructor plays a major role in establishing the educational climate and expectations for agricultural education in every school system. In a book entitled *DYNAMICS FOR EFFECTIVE TEACHING* (Kindsvatter, Wilen, and Ishler, 1988), the authors provide useful strategies for the instructor to simulate a productive learning climate by implementing four elements of effective teaching as identified in the research. These four elements include establishing an educational climate, promoting high standards, maintaining an orderly environment and enhancing teacher expectations for student success.

Developing a climate for success in agricultural education programs is a continuous process and requires the personal commitment of the instructor to develop or enhance existing teaching skills. Each of four elements for establishing an educational climate should be considered and evaluated to identify those areas in your program which could be developed to "Build a Climate for Success".



Incorporating science and technology into your program can attract non traditional students and enhance instruction (Photo courtesy of Sophomore Agriculture Students, North Polk High School, Alleman, IA).

## Establishing An Educational Climate

The existing educational environment which you provide on a daily basis sends strong signals to students about your



By David Spotanski and Martin Frick

(Mr. Spotanski is a Graduate Student, Department of Agricultural Education, Iowa State University. Mr. Frick is a Graduate Student, Department of Agricultural Education, Iowa State University.)

attitude toward them, teaching, and learning. When students select courses each year they may rely heavily on their own perceptions, or peer perceptions, before enrolling in your program. If existing perceptions are not positive, the student may hesitate or neglect to include your program in their schedules. Student expectations for the program will usually determine if they enroll and their reasons for enrolling. If the student enters your program with low expectations for learning, the student's perception may interfere with the overall learning process.

The following practices are recommended for the instructor to generate an educational climate in the classroom/laboratory.

1. Be task oriented.
2. Keep students on task.
3. Encourage students to do their work.
4. Give daily feedback.
5. Show confidence in students' ability.
6. Provide challenging learning activities.
7. Be supportive of students' efforts.

Instructors who consistently provide meaningful instruction and involve students in the learning process develop a learning, working atmosphere. In most cases agricultural education programs can provide a great deal of flexibility in curriculum and subject matter offered. Instructors should identify information which could be taught to maintain interest as well as provide a challenge to the student.

Developing a positive educational environment also requires frequent feedback and support for student accomplishments. Everyone appreciates the occasional "pat on the back" for learning something new or accomplishing a new skill. Providing this type of reinforcement to students, when appropriate, can help develop the students' self esteem and desire to want to learn more.

(Continued on page 14)

# A New Era In the Classroom: The Economics of Agriculture

Since its debut, vocational agriculture has traditionally provided training to students whose career objectives were either to return to the farm or to enter some other phase of the agricultural industry. At the time of the Smith-Hughes Act of 1912, very few alternatives were available to interested students other than production agriculture. The number of on-farm employment opportunities was much greater than the number of positions providing external support for agricultural production. Today, innovation and technology have changed the production methods and labor requirements to produce the same quantity of agricultural commodities. Along with these changes, the demand for students with training in management, marketing and finance has also increased. Are vocational agriculture programs providing the supply for this new demand?

Vocational agriculture has done an outstanding job of adapting programs to accommodate technological changes in production agriculture. This can be seen by the expansion of vocational agriculture into the fields of horticulture, forestry and floriculture. Practical experience is gained by students through the in-class use of greenhouse technology and through student placement into supervised occupational experience programs. In spite of strides made in production agricultural education, many programs in vocational agricultural are not providing students with the tools necessary to make practical decisions regarding the financial or operational management of agricultural operations.

The decreased demand from production agriculture for vocational agriculture students and the increased demand from the agribusiness community for agricultural managers begs the question, "Should vocational agriculture redirect its course content to successfully fulfill these new demands?" Are vocational agriculture instructors limiting themselves to just production agriculture, or should they adapt and expand their course offerings to incorporate basic economic concepts increasingly demanded by the agribusiness industry? This may be an appropriate alternative if vocational agriculture programs are to lead the ranks of high school courses into the 21st century as it has done in the past decades. The remainder of this article directs attention to 1) the current need for expansion into economics instruction and 2) suggestions for expanding the current course content in light of recent changes and expansion within the agricultural industry.

## The Need For Re-Direction

The need for new emphasis in vocational agriculture course content is associated with both national attitudes and state and local regulations. First, attitudes on the national level have changed with respect to the agriculture sector and to the literacy of the nation's youth. Legislators are becoming increasingly aware of the American taxpayers' unwillingness to finance unprofitable ventures. More and more, these



By Stan J. Bevers and Fred J. Ruppel

(Mr. Bevers is Research Assistant, Department of Agricultural Economics, Texas A&M University. Mr. Ruppel is an Assistant Professor, Department of Agricultural Economics, Texas A&M University.)

views are applied to the agricultural industry. Further, the push within secondary education has been towards reviving "basic" instruction. Here, the labeling of vocational agriculture as strictly "vocational" has been a problem. Deterioration of vocational agriculture programs due to limited federal funding can be attributed, in part, to these changing national values.

While many vocational agriculture programs maintain their state and local support, for others the national crisis has filtered down to affect local programs. Funding for vocational agriculture has had to be shared with new classes mandated by more stringent graduation requirements. Many potential vocational agriculture students have found it difficult to fit vocational agriculture into their schedules. Substituting three years of vocational agriculture for one credit hour of science has been a partial answer in some states. Many state and local programs have managed to keep up with the demands of an expanding agricultural industry and stiffer legislative requirements, but many programs have fallen further behind. For example, it is fair to say that any vocational agriculture program in the United States lacking hands-on computer instruction is in a state of obsolescence. If vocational agriculture programs are to regain their past prominence, a new direction may be in order. Since re-direction will likely require change, this expansion may be best directed toward instruction in fundamental economic concepts.

## Suggested Directions of Expansion

While some new emphases are needed in course content, many of the methods utilized by vocational agriculture instructors and programs need to be retained. Since the introduction of agricultural education, vocational agriculture programs have been famous for "learning by doing" and "hands-on" experience. These skills need not apply only to manual skills such as small engine repair or livestock production, but are also appropriate for situations such as determining an optimal marketing strategy or taking



an active part in a price determination process. Today's student needs to be exposed to the basic skills and concepts needed for a changing world, whether their decision will be to enter the labor force or go on to college. In effect, high school students today need to have the courses which would prepare them for college whether or not they are planning to go on to college. Below are five agricultural areas which have undergone substantial economic changes which need to be addressed in vocational agriculture instruction. Understanding the fundamental changes in each of these areas requires a basic understanding of economics, plus some detailed instruction of specialized subject matter.

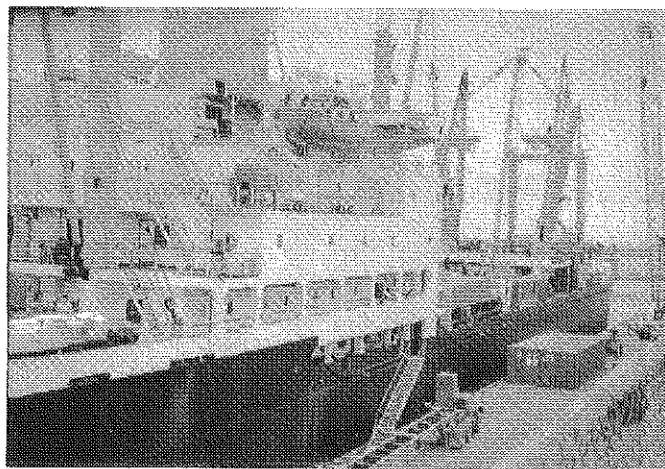
1) Production and Farm Management: While we have combined production and farm management in this article, in reality they are two different areas. Vocational agriculture was founded for the purpose of instruction in production agriculture. Accordingly, production has long been stressed. Today, however, there is more involved in producing a commodity than has been the case in the past. Management of the farm now involves decision-making which is based on projections of future product supply, demand and prices, in addition to current and future farm program benefits and requirements. Optimal production needs to be determined in the context of this information set. Production decision-making tools need to be taught in the classroom, with hands-on instruction in optimization techniques and scenarios analysis for various sets of input costs, technological constraints, and projected prices. New computer software is constantly being developed, and the availability of market information (such as that provided by the USDA and private forecasters) combined with technical know-how would make students better farm managers. It will be up to the vocational agriculture instructors to see that this instruction is incorporated into the classroom.

2) Marketing: Instruction in production and farm management provides the student with half of the market picture. However, it is the interaction of product supply with market demand which constitutes the price discovery process. Why do farmers receive the price they do? Who makes pricing decisions? Is there anything farm managers can do to assure themselves of a higher price? How can the risk of an opposite price movement be managed? These are questions which can easily be addressed within the vocational agriculture classroom. Because of the inherent volatility of farm prices, risk management has evolved into a new and exciting field, with boundaries far beyond agriculture. A number of marketing methods (such as forward contracts, futures and options) have allowed producers to "lock in" favorable prices prior to planting or harvesting their crops. Moreover, these marketing tools are not limited to use by production agriculture. Other agribusiness enterprises on both the input side and beyond the farm gate have utilized risk management strategies to increase profits through enhanced stability. Instruction in marketing and risk management would be relevant for many careers chosen by vocational agriculture students. These students need to be taught that profits do not result simply from taking a product to market. Strategic planning beginning with planting decisions and continuing through the marketing of the product needs to be stressed.

3) Finance: Virtually every business in the United States has a finance component (either a few individuals or an

entire department) which gathers the necessary funds for operating credit or expansion. While some agricultural producers have found themselves at the mercy of financial institutions, large corporations have found that the thrift industry depends upon borrowers to survive and have learned to negotiate strategic terms of credit. The corporate edge has depended on accurate and detailed records. While recordkeeping has long been a trademark of vocational agriculture programs, these skills need to be enhanced (or expanded) to include detailed financial analysis (statements and ratios), tax strategies and estate planning, and financial risk assessment and management. With enhanced financial training, vocational agriculture students are much better prepared for futures as either farm managers or agribusiness employees. Vocational agriculture instructors can teach these skills through interactive instructional computer programs and through the services of resource individuals in the banking community and in the state extension services.

4) Agribusiness: Decision-making skills and management expertise are becoming increasingly important in agribusiness firms. Farm supply stores juggle decisions concerning employment levels and optimal inventory holding. Food processors are constantly doing feasibility analyses on adaptability of new manufacturing processes. Technological progress has drastically changed the way retail merchants transact their business. For the large number of students who become an attractive alternative, agribusiness has gone from a supporting role in agriculture to an industry all its own. probably the most constraining issue to teaching agribusiness in the vocational agriculture classroom has been the lack of adequate curriculum. In a broad sense, curriculum lays down the basic framework or boundaries for a particular subject. This makes the development of agribusiness curriculum difficult in that these boundaries are not well-defined for the agribusiness sector. While the agribusiness sector has been a prominent employer of vocational agriculture students, this may be one of the most under-instructed topics in vocational agriculture.



Cargo ship in port at Houston TX (Photo Courtesy of Stan Bevers)

5) International Trade: The internationalization of American agriculture is probably the most characteristic of changes within the agricultural sector that vocational agriculture programs have kept up with. While these markets have played a large role in determining farm and

*(Continued on page 21)*

# Student Behavior Problems

Each year many teachers in the various disciplines, including Agriculture, give up teaching. Why? The answer is usually found in their inability to cope with student behavior problems. Various forms of physical discipline used in the past are no longer acceptable in today's society, and teachers in the 1990s will have to look at a host of other potentially effective solutions.

In the opinion of many teachers, student behavior problems intensify in proportion to the number of disadvantaged youth in their classes. Research indicates that this appraisal is accurate. Students dissatisfied with school and unable to succeed in the school environment are indeed likely to disrupt classes. Generally, too many teachers have been unable to solve student behavior problems. The problem is perplexing, but it can be resolved. Teacher behaviors, school environment, home environment, and student personality all interact to prevent or guarantee unacceptable student actions.

## Teacher Behaviors

Most teachers agree that getting off to a good start during the first few weeks of school is essential for good classroom management. During this time students learn behaviors and procedures needed throughout the year. Student cooperation is essential in following rules and procedures and successfully completing all work assignments. Attaining this cooperation will establish a classroom climate that supports learning and will help students acquire good work habits and attitudes toward vocational agriculture.

Teacher behavior influences classroom learning and teachers must be cognizant of the fact that both teacher's personality and behavior influence the behavior of students. Teachers must, therefore, attempt by their behaviors to create a classroom climate conducive to learning. Respect for students is an essential teacher characteristic. Most disadvantaged students already suffer from damaged self-esteem. They have not been successful in school. When a teacher demonstrates that he/she cares about the student, positive reactions occur in the student.

Teacher verbal behaviors can have a profound influence on students' behavior. Withall classifies teacher verbal behaviors into seven categories, three of which are labelled learner centered. He advocates a minimum of two-thirds of teacher verbal statements be made in one of these areas: 1) learner supportive statements or questions, 2) acceptant or clarifying statements or questions, and (3) problem-structuring statements or questions. All three of these responses reflect a non-threatening teacher role.

The net result of these types of teacher behaviors is a classroom where students are respected and open inquiry is encouraged. Consistent learner supportive teacher behavior is one element that reduces student misbehavior.

Following the three learner supportive type statements and the classroom arrangement type statement classified as neutral are three teacher-centered type statements. Persistent and excessive use of teacher supportive statements un-



By Pierce Farragher

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doubtedly results in greater amounts of student misconduct. These statements are: directive, reproving, disapproving, or disparaging, and teacher supportive. Extensive use of these latter types of teacher behavior completely destroys cooperative efforts from students.

## Establishing Classroom Behavior Standards

Students must have a clear understanding of what is expected of them as they work individually and in groups. This is the basis for running an effective vocational agriculture classroom. Some recommended practices are as follows:

- Develop and clearly communicate behavior standards.
- Assess how well the behavior standards have been communicated.
- Assess the effectiveness of the behavior standards.

## Motivating Students

Adolescents need to be motivated to fulfill their potential in life (Levine, 1988). The best motivator in a vocational agriculture classroom is a teacher who is alive with enthusiasm for the subject. The most effective motivational activities are those in which the purpose of learning is clear and relevant to the lives of the students. The ultimate motivator is love. Dedication, patience, and a sincere interest in students' well-being are the most effective attributes. Other recommendations:

- show interest and concern in student work; give personal help when needed
- be clear
- promise students a successful year. Invite success!
- do not rush; work at a reasonable pace
- use a variety of methods and materials
- plan your teaching carefully and be well prepared
- make goals and objectives clear to students
- involve students through the use of discussion, discovery approaches, individual assignments, and, at times, time group planning
- give students the responsibility and assistance necessary to identify and develop goals
- encourage feedback
- inform students about how they are going to be graded; grades can be a powerful motivational tool for teachers

## Teacher-Student Relationships

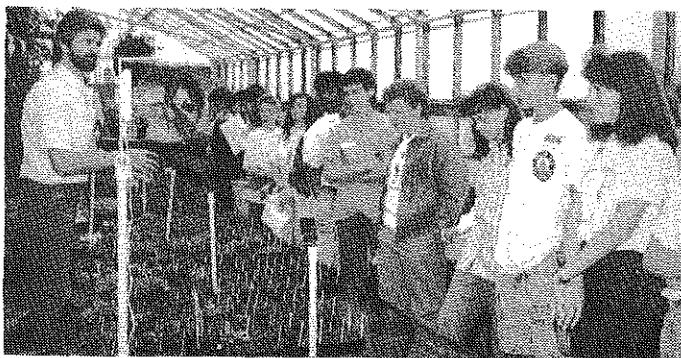
To be an effective teacher and to minimize student misconduct, positive teacher-student relationships are required. In the student-teacher relationship teachers often respond to unacceptable student behaviors in inappropriate ways. These inappropriate methods may be labelled as solutions messages, put-down messages, and indirect messages. They correspond with the teacher centered behaviors previously presented. Needed then are teacher competencies in communicating with students. Rapport or positive teacher-student relationships go a long way in preventing conflict or in dealing with conflict constructively.

## Roadblocks to Communication

As far as teacher competencies in communicating with students are concerned, the thousands of possible unacceptance messages that a teacher can send can be classified into twelve categories as follows:

1. Ordering, commanding, directing.
2. Warning, threatening.
3. Moralizing, preaching, giving "shoulds" and "oughts".
4. Advising, offering solutions or suggestions.
5. Teaching, lecturing, giving logical arguments.
6. Judging, criticizing, disagreeing, blaming.
7. Name-calling, stereotyping, labeling.
8. Interpreting, analyzing, diagnosing.
9. Praising, agreeing, giving positive evaluations.
10. Reassuring, sympathizing, consoling, supporting.
11. Questioning, probing, interrogating, cross-examining.
12. Withdrawal, distracting, being sarcastic, humoring, diverting.

Categories 9 and 10 should be interpreted as attempts by teachers to make a student feel better, to make a problem go away, or to deny that the student even has a real problem. The twelve kinds of messages tend to block further communication; they slow down, inhibit, or completely stop the two-way process of communication that is so necessary in helping students solve the problems that interfere with learning.



Effective teachers use questioning and wait-time to encourage application, analysis, and evaluation of new information. Photo by Dr. L. H. Blanton, Clemson University.

## Questioning

A technique of vital importance when dealing with student behavior problems is that of questioning. Counsellors and therapists have discovered that questioning and probing, when other persons own the problem, often acts as a roadblock or communication stopper. Why this happens can

be understood, first because people feel threatened when they think someone is probing too deeply into feelings they are unprepared to share with another. When this inner private world is invaded, people often close up in self-defense. Teachers must be aware of this when questioning students in the classroom. Secondly, questions can be very derailing if they are irrelevant and not on target, as is too often the case. Thirdly, most questions severely limit the range of the subject matter or feelings or topics the person with the problem can communicate.

## Language of Acceptance

The Twelve Roadblocks are the language of unacceptance and are very ineffective responses in the helping relationship. But why is the language of acceptance on the other hand more effective? How do you communicate acceptance and the desire to help another? What do you say to a troubled student that will be helpful? If you avoid using the Twelve Roadblocks, what are alternative ways of responding?

When a teacher is able to feel and communicate genuine acceptance of a problem student, a capacity exists for being an effective helping agent. Acceptance of the problem student, as a person, is an important factor in fostering a relationship in which the student can grow, develop, make constructive changes, learn to solve problems, move in the direction of psychological health, become more productive and creative, and actualize his/her fullest potential.

The language of acceptance opens students up. It frees them to share their feelings and problems. Conversely, unacceptance closes people up, makes them feel defensive, produces discomfort, makes them afraid to talk or to take a look at themselves.

Teachers can be taught the same skills used by professional counsellors and thereby drastically reduce the frequency of messages which convey unacceptance in the classroom. When teachers learn how to demonstrate through their words an inner feeling of acceptance toward a student, they are in possession of a tool that can produce some startling effects. They can in essence, change negative behaviors in students to positive behaviors.

## Preventing Misbehavior

Shown below are suggestions which teachers may use to help prevent student misbehavior.

1. Establish rapport with students
  - let students know you are working for their sake
  - take interest in each student's personal problems and concerns
  - give students an opportunity to help
  - treat all students equally and with respect
2. Develop class morale and loyalty
  - organize activities that involve the whole class, i.e., field trip
  - allow for group decision making and responsibility
  - communicate your positive expectations of each student
3. Deal with students and situations in a consistent manner
4. Deal with misbehavior in an impersonal manner
  - let misbehaving students know it is not them you dislike, but their behavior.

(Continued on page 13)

# Excellence: The Teacher Makes the Difference

And the winner is . . . many agricultural education departments and FFA chapters experience this exciting time regularly, but yet others experience it quite rarely. What makes the difference? It's not the program because each department has the same opportunities available to them. It's not the students because our programs are so broad and diversified that each student and program can achieve excellence in some particular area. It must not be the facilities since we find successful programs from very limited situations. In most cases, the answer is simple: *The Teacher Makes the Difference*. In our continuing quest for "Excellence in Education", there is no denying the fact that we, as educators, have the primary responsibility in the success or failure of our students. The role of an Agricultural Education teacher is not easy to define since our jobs encompass so much. Yet, there are certain roles which we can, and must perform if we are to continue to take pride in our excellence.

## The Teacher as an Expert

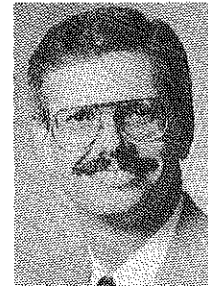
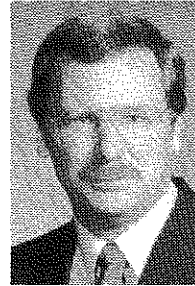
As we stand before our classrooms, we are connected to our students because to some extent, and in some form or other, we are recognized as experts. It is our goal to transmit information, perspectives, and viewpoints which we wish our students to acquire. Probably the two most frequently thought of ingredients of our roles as experts are: 1) knowledge of subject matter and 2) use of teaching techniques.

Knowledge of subject matter is perhaps more difficult for an agricultural education teacher than for any other educator. Not only must we be a "Jack of All Trades," but we must also be a "Master of All Trades." In the exploding world of biotechnology and diversification in agriculture, agricultural education instructors must be as versed in genetics and vegetable production as we are in grooming a show steer and welding. There is a never-ending need for instructors to continue their education, enhance their knowledge, and become even more of an expert.

For excellence to take place in our classrooms, not only must the instructors have a knowledge of the subject matter, but they must also have the ability to put this knowledge across in a professional manner by using a variety of teaching techniques. Effective instruction, in any field, will be no better than the teacher and the methods used. Also, enthusiasm must go hand and hand with this mastery of methodology. It is awfully hard for students to become enthused about something that their instructor isn't even excited about. The way the material is presented and the outlook of the teacher on life and teaching are extremely important.

## The Teacher as a Motivator

There are two facts concerning motivation — it comes from within and not everybody is motivated the same. Even though motivation comes from within, there are ways an



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instructor can sneak inside a student and cause a spark to get a fire going. Some students will provide their own motivation but the challenge comes in motivating those who are lacking the desire to excel. This responsibility, within the confines of the classroom setting, rests solely on the teacher's shoulders. Motivation is of great significance in the classroom. Louis J. Rubin, in his book *Artistry in Teaching*, states, "Aside from their command of subject and method, great teachers excel at encouraging motivation in their students. They weave their spell, catching their students up in the excitement of what is going on, and understanding progresses rapidly."

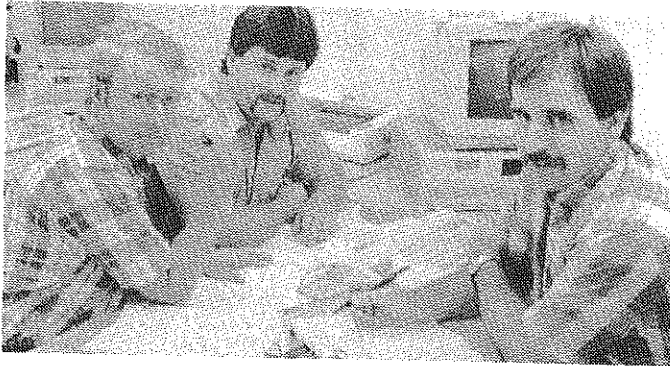
Agricultural education instructors have one leg up on most instructors where motivation is concerned. The opportunities we have to carry our instruction beyond the classroom and into our supervised occupational experience programs and FFA activities afford a precious opportunity to instill motivation within our students.

## The Teacher as an Artist

Whatever their art, all artists have the ability to carry out their tasks with great skill. Such is the case with "Artist" teachers. The cultivation of excellence within these teachers results from their selection of educational goals, creative means of obtaining these goals and their continuing quest for improvement. We hear much in the news today about the frustration and dissatisfaction of teachers. Having students read from core curriculums or textbooks and doing the same things from year to year only add to these emotions. Care must be taken when teaching to take learning to the higher levels by getting maximum student involvement and challenging them to think for themselves. All too often students rely on teachers and textbooks as the "gospel" instead of using their own reflective thinking process. Sometimes we, as teachers, promote this by not allowing students to think. Charles Reich referred to this when he said:

*"School is intensely concerned with training students to stop thinking and start obeying. Any course which starts with a textbook and a teacher and ends with an examination runs the danger unless great pains are taken to show students that they are supposed to think for themselves; in most school and college classes, on the other hand, thinking for one self is actually penalized, and the student learns the value of repeating what he is told."*

We would like to think the reason Mr. Reich didn't say this about "all" classes is that he had observed some agricultural education classes which were different.



Effective teachers know the subject and understand student learning. They plan a variety of teaching techniques which match learning objectives and student needs. (Photo courtesy of Lloyd Blanton)

Becoming an "Artist" teacher is one of the best solutions to the problems of frustration and dissatisfaction. "Artist" teachers invest more in, and profit more from, their work. They experiment freely, aim high, go the extra step and do whatever is necessary to accomplish their objectives. They enjoy their reputation as great teachers and believe that excellence is always attainable.

### The Teacher as a Role Model

*"A student is not above his teacher, but everyone who*

*is fully trained will be like his teacher."* (Luke 6:40, NIV)

Three facts of life exist — birds fly, water flows down hill, and kids learn. Our students are learning all the time but not all of their learning takes place in the affective domain — the domain dealing with our attitudes, values, and interests. Agricultural education teachers traditionally spend more time with students than do any other teachers and, in some cases, more time than the parents themselves. This point reinforces the fact that we must watch our actions. The teaching profession runs a close parallel to the preaching profession. Teachers should be good role models, set good examples for their students and be leaders in the community. How many times have we, as agricultural education teachers, witnessed students dressing the way we dress, talking the way we talk, pursuing education the way we pursue education, etc.? Inevitably, we have witnessed this phenomenon.

### Conclusion

With family situations the way they are today, agricultural education instructors must often double as father, mother, counselor, and friend. Keeping this in mind, we should be constantly reminded of the responsibility which we bear. As leaders, many of the things we do will be returned to us. Our students use our knowledge (or lack thereof), our actions, our enthusiasm, our expressions and even our habits. When we witness our former students go on to excel in college, business, industry, government, or home on the family farm, they are always a reflection of our teachings. We can recognize our excellence when we take a look at their successes and know that we have, truly, "made the difference."

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## Student Behavior Problems

(Continued from page 11)

5. Communicate effectively with students
  - speak effectively
  - give students an opportunity to express themselves
6. Locate sources of misbehavior
7. Rules can modify student conduct under certain specified conditions
  - students must know the rules
  - give students a part in developing the rules
  - develop only those rules necessary for efficient instruction
8. Change the school environment
  - make sure you can see students at all times (no "blind spots")
  - use the classroom, shop, greenhouse or laboratory arrangement best suited for instruction
  - a clean, attractive room provides a sense of security and discipline

## Handling Behavior Problems

Every teacher at one time or another is faced with behavior problems of varying degrees of seriousness. The guiding principle to follow in handling behavior problems is to be objective, consistent, impersonal, yet firm. To handle behavior problems the following practices are recommended (Levine, 1988):

- use rewards and punishments wisely
- monitor the effects various rewards and punishments have on students
- communicate and work with parents, fellow teachers, and administrators

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## Teaching: Building a Climate for Success!!

(Continued from page 7)

*"Giving the student effective feedback that explains what students need to do and how they are to do it is a key step in building student intrinsic motivation and paving the way for higher achievement."*  
(Kindsvatter, Wilen, Ishler, 1988)

### Promoting High Standards

Setting reasonable standards for performance in the classroom/laboratory includes maintaining an acceptable level of performance on everything from conduct to homework and projects. The goal for these standards should be to create a climate in the classroom/laboratory which conveys the following: the business of the classroom/laboratory is to learn; the student is expected to achieve; the teacher has high standards for themselves and their students; and the program is concerned for the student.

A study conducted by Block (1970), examined the impact standards had on students' performance and attitudes, and found that higher standards resulted in higher cognitive achievement. The study also found that when required performance standards were too high, student activities were affected negatively. This indicates the need to establish performance standards which will challenge students yet not discourage them.

The following practices can convey to students that high standards are maintained in the classroom/laboratory.

1. Set minimum performance levels.
2. Maintain standards for performance.
3. Recognize quality work and effort.
4. Maintain a professional image.
5. Help students discover the excitement of learning.
6. Challenge, but do not frustrate the student.
7. Emphasize higher level thinking, and comprehension.

Recognition for outstanding student performance can be given in a variety of forms. Displaying the work in the classroom, school lobby, community newspaper, or allowing the student to share their experience with others are effective ways.

Promotion of high standards in the classroom/laboratory can be communicated to the student by the teacher's professional behavior. The teacher's behavior indicates acceptable standards for conduct, just as written rules and procedures are given to students. Teacher behavior which reflects a professional attitude may include such practices as lessons prepared in advance, correct use of grammar, correct spelling, and legible handwriting on the board and papers, prompt return of student work, and the teacher's demonstration of responsibility.

### Maintaining an Orderly Environment

Learning is dependent on students being on task. Much of the teacher's time is devoted to planning and maintaining order in the classroom/laboratory. To maintain an orderly environment teachers must learn how to manage groups and structure the classroom around specified goals

so that they spend a minimal amount of time on classroom disruptions. Some of the management practices used by effective teachers in maintaining an orderly environment and in making the initial decisions on establishing order are:

1. Establish class routines, procedures, and rules.
2. Let students know what they are to accomplish and how they are progressing.
3. Be well prepared for each lesson.
4. Use instruction time purposefully.
5. Keep students on task.
6. Smooth transition time.
7. Handle interruptions and disruptions promptly.
8. Handle management problems promptly.

An orderly classroom/laboratory is structured so that students know the expectations the teacher holds for them. A structured classroom does not mean a classroom which does not allow the students the opportunity for creativity, input or spontaneity. Indicators of an orderly classroom include: a framework for the class to function smoothly; opportunities for students to share ideas; lesson plans which are regularly updated, and individual student needs are addressed.

### Teacher Expectation for Success

Research literature is full of studies which substantiate the effect of teacher expectations on student achievement. An evaluation by Good (1981), regarding ten years of research on teacher expectations concluded that teachers behave differently toward different students, and affect student achievement. Over time, student achievement and behavior will conform more and more closely to the teacher's expectations.

The classic "Pygmalion in the Classroom" study by Rosenthal and Jacobson (1968), indicated that the teachers attitude toward the student does influence student performance. This self-fulfilling prophecy illustrates the need for teachers to be aware of the effect their expectations may have on student behavior. Students may behave in a particular way because the teacher conveys those expectations. Therefore a student who is considered slow by his/her teacher might consider themselves a poor student in the class regardless of their ability.

Teachers can develop a climate for success in the classroom/laboratory by doing some of the following practices:

1. Have a positive attitude concerning student abilities.
2. Develop positive attitudes in students toward their success in the subject.
3. Help students understand that success can be reached through their efforts.
4. Demonstrate that the teacher and the school are supportive of student success.
5. Adapt learning activities and materials to fit the students' abilities for success.
6. Provide all students with opportunities to be successful.
7. Give effective feedback.
8. Become aware of messages being communicated to students - both verbally and nonverbally.
9. Show interest in all students.
10. Check for student understanding.
11. Encourage students to compete with themselves.

(Continued on page 21)

# Using Personal Warmth

Our students are astonished at the technological advances we have made within the last decade. If the truth be known, perhaps all of us are bewildered regarding the fact that the industry of agriculture has become such a highly technological and scientific based industry. It is no wonder that because of "Hi-Tech", "Fast-Tech", and "Life-in-the-Fast-Lane" we, as teachers, may have tendencies to over-emphasize the need to become or remain technically competent. Even so, it is of extreme importance that we not permit our quest for technical competence to jeopardize or impersonalize our teaching environment. There remain other skills in addition to technical competence that are just as necessary to achieve success as a teacher. For example, it is essential that teachers be proficient in communicating and working well with students. Developing an excellent rapport with students surely will enhance classroom instruction.

A most serious criticism, with which we have to contend, is that far too often teachers have too narrow a perspective and lack communication and human interaction skills. And as well, more frequently than we would like to admit, some teachers in the classroom exhibit little, if any, personal warmth. But all is not lost, each and everyone of us, can learn to develop and express personal warmth and become one of those teachers students are comfortable with. Some teachers have a special talent for pleasing and putting students at ease. Yet their kind of pleasing comes with backbone, not acquiescent mush. They are decisive and they can exercise authority in a variety of situations without intimidating their students. They are liked and admired by everyone. Why then, if magnetic teachers are not all that nice and generous, are they liked so much and are so effective in the classroom? It is because they give students a reason to like themselves. The magnetic teachers have developed excellent human relation skills. They have sincere and genuine interest in their students; they are less self-centered; they have the ability to laugh; they have a consistent character; they listen; and they create a comfortable atmosphere for students.

If you would really like to become one of those magnetic teachers, who have the ability to astonish their students with personal warmth, you can! "How?" you ask! The answer is not as simple as you may think; however, you can get a good start by implementing the following six steps.

1. *Express a sincere and genuine interest in students.* Teachers of agriculture must be aware that skills necessary for success include the ability to work cooperatively and harmoniously with others (Newcomb; McCracken, and Warmbrod, 1986). Social skills are important, but the really big secret is to really like, respect, and understand students. To have a sincere and genuine interest in students with respect to what they are thinking, doing, or feeling is a step toward achieving personal warmth. It is important to learn to react with sensitivity to the needs and feelings of the



By Eddy Finley

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students, to help students build self-awareness and a positive self-concept, and to provide positive reinforcement.

2. *Be less self-centered.* In becoming one of those teachers everyone is comfortable with, the secret is to have no feeling of jeopardy that your own value will be diminished if someone else has value. Of course this is accomplished by having a strong foundation of self-knowledge and self-acceptance. A solid sense of self that makes you feel comfortable with the rest of the world will also enable you to free your curiosity and energies for your students. It is apparent that magnetic teachers have a strong sense of identity without that "I" at the head of it. Learn to accept and/or use ideas that the students may have.

3. *Laugh at yourself — don't be oversensitive.* The ability to laugh at your own imperfections creates comfortable feelings among students. Humor makes people loosen up and laughter helps to break down barriers (Orme, 1986). Students become relaxed because they don't have to fear outbursts of anger or frustrations. By laughing at yourself, you convey that you are not oversensitive and even friends do not have to watch everything they say. Humor is a way of structuring the world and defining things that make us less likely to be hurt by them. To further yourself toward expressing personal warmth, develop the ability to perceive, appreciate, or express the things that are funny or amusing. A good sense of humor, the ability to keep classes lively and interesting will contribute as much as anything to good attendance, morale, and overall achievement.

4. *Consistent character.* Confidence enhances security and security brings about comfort. Magnetic teachers are confident in themselves and they have the ability to inspire confidence in others. No one appreciates a teacher who is always changing their position merely to receive approval and no one appreciates teachers who give false reassurances or phony compliments. To be responsive to students but to be firm when necessary (in order that they know where they stand) is another step toward achieving personal warmth in the classroom. Kirst (1986) stated,

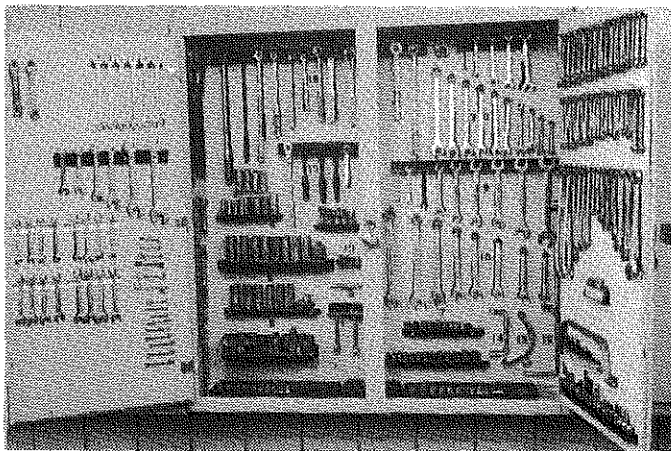
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# Brighten Up Your Laboratories

Most of us would agree the attractiveness of the learning environment will, at least to some degree, affect the level of learning that occurs. Thus, it is important we consider the physical health of the laboratories used in our instructional programs. I realize if your laboratory is old and out of date your educational environmental quality will be limited. However some steps can be taken to improve the pleasantness of your laboratory whether its old or new.

## The Action to be Taken

Take a look around your laboratory areas and examine closely. Be sure to be critical enough, or have a fellow teacher examine your laboratories. A laboratory you work in several hours per week may become run down and unattractive without you noticing. Are your laboratory walls and equipment old, worn or faded? Repainting of walls and equipment, including safety color coding, can make equipment look almost new. A safer laboratory will be a bonus for your efforts.



Agricultural Mechanics Laboratory tools can make an impressive display. The contact paper silhouettes allow students to easily find the designated storage space for each tool.

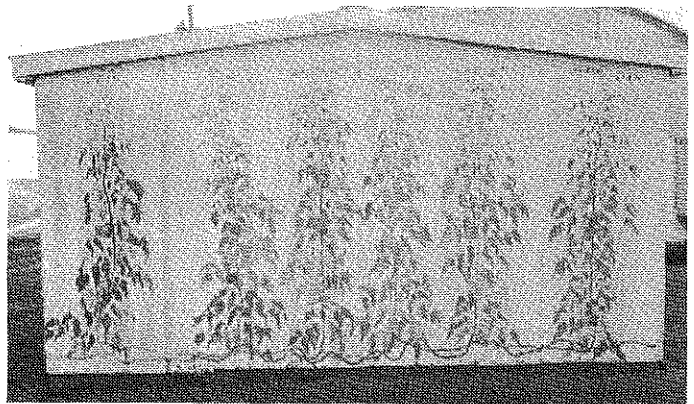
Does your laboratory have available wall space for posters and other instructional aids? These can improve the learning environment, be an information source for your students and help reinforce previous teaching. Posters can easily be developed by using overhead transparencies and tracing the projected outline onto a poster. Other materials suitable for posting, can be obtained from supply and equipment companies as well as educational organizations. Your posters need to be colorful and laminated for long life.

Mounting items such as engine parts, electrical fixtures, plumbing materials, plant materials and livestock equipment to pieces of plywood can make attractive and educational wall displays. Paint the boards with pleasant colors before mounting. Include the name and the function of the items posted, if possible. Be sure the method used to secure the items to the board is sufficient.



By David Drucekhammer

*(Dr. Drucekhammer is an Assistant Professor, Agricultural Education, University of Southwestern Louisiana.)*



The mural on this building provides a charming addition to this hydroponic vegetable production laboratory.

A well thought out plan for locating equipment, tools, supplies and other instruments used in the laboratory can add greatly to the lab's attractiveness. Develop a designated place for every item in your laboratory. Inform and train your students as to where each item should be located when not in use. Contact paper silhouettes of each tool and instrument will greatly assist your students in finding the proper storage place.

## Benefits to the Teacher

A well organized and attractive laboratory can improve both student performance and safety. The image of your program can be greatly improved by organizing laboratories. A well organized laboratory gives the impression, to school administrators and taxpayers, of money well spent. In times of limited finances for education, the success of your educational program may depend upon the quality of care and organization given to your laboratories.

## Summary

A little time spent each week, or during the summer, can greatly improve your efficiency and enjoyment as a teacher. Little improvements made in laboratory environments will generally add to the long term development of your instructional program. So what are you waiting for? Take a careful look at your laboratories. Develop a plan of action and get started. Improvements you make today will affect the rest of your teaching career.



# Protection From Hearing Damage

Many vocational educators who specialize in fields such as Industrial Arts, Trade and Industrial Education, Vocational Agriculture, and others, are aware of many 'old timers' in the industry who have poor hearing. Much of that hearing loss is due to noise exposure in the work place. Studies reveal that among the causes of hearing loss are such things as noise exposure and high cholesterol levels. Noise exposure is the major overall determinant in hearing loss. How does this loss occur? Why do people stay in environments which are damaging to their hearing?

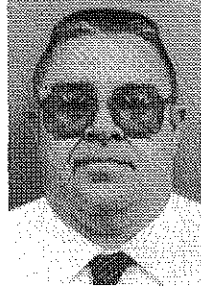
Hearing loss is insidious. The ear warns us with discomfort when we are in danger, but it soon becomes overloaded and the cells which are responsible for sending the frequency and level of sound messages to the brain stop functioning. This loss of hearing is called a 'threshold shift' and is measured in decibels. Threshold shift is often temporary and a rest period away from noise is normally all that is required to recover. An exposure to noise that caused a 5 decibel threshold shift (that is, it requires a 5 decibel increase in the sound level for it to be heard) would require a 2 minute rest period to recover. An exposure to noise which caused a 25 decibel threshold shift would require nearly a 17 hour rest period for recovery!

If the source of noise is too intense, the exposure too long, or the rest periods too short, the threshold shift becomes permanent and we experience a hearing loss (or permanent threshold shift) in the range of the offending noise. There is great danger in the threshold shift. When it occurs, our brain is "tricked" into believing that we have become accustomed to the noise. It is true that we lose awareness of the noise, but the loss of awareness is due to the damage to the ear which continues to progress.

## The Concern

Why should there be concern about noise for vocational educators? Vocational educators do a good job of providing skills and experiences which are appropriate for students to gain competencies required to enter occupations. This ability to duplicate industry competencies means we also duplicate the exposures to noise which are common in the workplace. The only difference is, because exposures are normally shorter, we do not see noise exposure as a serious safety issue. To some degree this may be true.

A recent study revealed that in one modern welding facility, the exposure to common arc welding noise was well below the danger level for hearing loss even though it approached the level of concern for student performance loss (90 decibels). A student grinding steel plate in the same facility spent 23 minutes completing the task. During the time, he experienced a maximum exposure of 110.1 decibels and his exposure equalled 25% of the allowable total OSHA recommends for an 8-hour period. If that student continued the same activity for an entire class period, he could be in danger of a permanent threshold shift in the frequencies of sound a grinder produces. It is very unlikely that a person in the school age group will adequately rest his/her hearing



By Glen M. Miller

*(Dr. Miller is an Assistant Professor, Department of Agricultural Education, The University of Arizona.)*

between exposures because of other environmental noise exposures.

In this same laboratory, there was another individual who had a nearly equal exposure over an even greater time period. That person was the vocational education instructor. While students typically have short exposures, the instructor may be exposed for an entire school day to repeated dangerous noise levels. Little has been done to document instructor exposure or occupational hearing loss, but we can safely assume that it is approximately equal to student exposure only of longer duration if the instructor is providing close personal supervision.

## Your Obligation

What can we do to protect ourselves and our students? First, we must be aware of the few danger signals our ears send us. If you experience a ringing in the ears, a problem hearing certain sounds for more than a few hours, or a tickling sensation in the ears, then it is time to take action. Remove the source of noise or use some type of hearing protection device. Unfortunately, permanent damage can occur at levels well below those required to cause the symptoms listed above.

Monitor the noise in your shop or where your students learn. Know which activities require hearing protection for yourself and your students. Noise meters are available from many sources and at many prices. If your budget is limited, one national electronics chain store sells a sound level meter for about \$30.00. Follow the Occupational Safety and Health Administration (OSHA) guidelines for exposure.

Permissible sound exposures established by OSHA:

Hours per Day of Exposure	A-Weighted Sound Level, db
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

*(Continued on page 18)*

## Protection from Hearing Damage

(Continued from page 17)

Reprinted from General Industry OSHA Safety and Health Standards (29 CFR 1910.95). U.S. Dept. of Labor, November 1978.

### Action

When in doubt, have your students wear hearing protection devices. Because we have the potential for permanent

hearing damage and loss of performance, it is far better to be conservative and issue hearing protection devices to your students as routinely as safety glasses.

When it comes to hearing protection for our students and ourselves, we have a moral and legal obligation to protect hearing from damage. Don't risk your senses. Become informed and aware of the shop or workplace environment and use hearing protection devices.

## Ten Essential Elements of the Problem Solving Approach

(Continued from page 5)

The information, data, and potential problem solutions are weighed to determine the significance of each to the situation being considered. Each potential solution will be evaluated using the factors established by the class. After analyzing the evidence, the students come to a group conclusion to the problem. Evidence must be presented as to why the solution is the correct one.

### Testing Possible Solutions

Once the tentative solution to the problem is established the students will implement the solution. By implementing the tentative problem solution the students are executing the doing stage of the problem solving process. Students have the opportunity to prove for themselves the usefulness and relevance of their problem solution.

### Evaluating the Results

The results of the solution are evaluated and the success and/or failure discussed by the students. The evaluation will lead to a satisfactory solution of the problem or result in another problem being identified and the process started over again. Students are able to evaluate their own progress and establish what they have learned. When students have knowledge of their learning progress, their performance will be superior to what it would have been without such knowledge (Newcomb, McCracken, and Warmrod, 1986).

### Summary

The key element that makes the problem solving approach to teaching unique is that students use the scientific method of problem solving to solve real everyday problems. The process can be summed up in the following ten essential elements of the problem solving approach:

1. Instruction is organized around solvable problem statements.
2. Students explore the problem situation.
3. Students develop a clear-cut statement of the problem.
4. Students discover possible solutions to the problem.
5. Students find and interpret information needed to analyze the possible problem solutions.
6. Students discover factors to be considered in accepting the problem solution.
7. Students help weigh and process information gathered to determine its significance to the problem statement.

8. Students discuss and arrive at a tentative solution to the problem.
9. Students implement the solution under the teachers guidance.
10. Students evaluate the results of the problem solution.

How well are you using the ten essential elements of the problem solving approach to teaching? An instrument was developed to measure the level to which teachers incorporate the problem solving approach in their instruction (Boone, 1988). The evaluation is centered on the degree teachers use the ten essential elements of the problem solving approach. A copy of this instrument is included at the conclusion of this article. You are encouraged to perform a self evaluation on your latest unit and determine how well you are using the problem solving approach in your teaching. If you score a 6 or 7 then you are incorporating most of the essential aspects of the problem solving approach. A score of 4 or 5 would indicate that you are using the problem solving approach but you should work at including more of the essential elements of the approach in your teaching. If you scored less than 4, your students are not receiving the benefits of the problem solving approach to teaching.

The problem solving approach to teaching is a learning process. Students instructed with a problem solving approach are not only taught subject matter but are taught how to learn and solve problems. This learning process will continue to be used by the students throughout their life. The problem solving process can be summed up in the following adaptation of a saying: "Give a student information and you will solve his problem today, Teach that student how to solve the problem and he will continue to learn and solve problems throughout his life."

(Continued on page 23)

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# Super Teacher!

"I quit" is an often heard teacher reaction to undue stress in secondary vocational agriculture programs. It seems that stress is the common denominator of today's society, and increasing demands in education have produced stressful effects on teachers. The effect of stress can be positive in that a certain amount is necessary for motivating action. However, when teachers begin to report chronic feelings of irritability, fatigue, frustration, and anger, stress may be having negative effects that result in teacher burnout.

The impact of stress and burnout on the quality of and consistency of teaching is real and clearly serious. These factors have repeatedly led to increased emotional, mental, and physical dysfunction among teachers and other school personnel. It is beneficial to identify causes of stress and suggest alternative means of coping in an attempt to prevent much of this unnecessary turnover.

## Definition

Burnout has been defined in a variety of ways. Freudenberger and Richelson (1970) define burnout as, a state of fatigue or frustration brought about by devotion to a cause, a way of life or a relationship that failed to produce the expected reward. Another definition is that burnout is a progressive loss of idealism, energy, purpose, and concern as a result of the conditions of work (Edelwich & Brodsky, 1980). It is a feeling that no matter how hard one works, the payoff in terms of accomplishment, recognition, or appreciation are not there. Burnout is a result of unmediated stress that seems to have no "out," no buffer, no support system, and no adequate rewards.

It is readily apparent that burnout can have immediate and long-term debilitating effects, both emotional and psychological, on teachers' worklife and beyond. Burnout is a major factor in low teacher morale, absenteeism, tardiness, and high job turnover. Teachers who become burned out may be less committed to their work and have a lower tolerance for frustration in the classroom. They tend to plan less for classes and be less sympathetic toward students. Such teachers may suffer chronic emotional or physical exhaustion and depression and fantasize about leaving the profession. If left unchecked, burnout will inevitably affect the teacher's non-work situations in the home and community. It is imperative that we raise our awareness of the problem and provide some useful strategies for treatment.

## Causes

What factors are responsible for creating teacher burnout? The answer for this question would differ from teacher to teacher depending on situations and circumstances. However, there appears to be several categories into which common causes of burnout can be placed. The categories suggested by Cooper and Marshall (1978) and some respective causes are summarized as follows:

1. Relationships at Work — Poor interpersonal relationships among colleagues and feelings of isolation from other



By Thomas L. Grady

*(Dr. Grady is and Assistant Professor, Department of Continuing and Vocational Education, University of Wisconsin-Madison.)*

teachers (co-workers), both in the school and in the profession, are a source of frustration and dissatisfaction.

2. Organizational Climate and Structure — An organizational climate and structure in which one has little or no participation in decision making often leads to a failure to communicate with other faculty and particularly with administration. Inadequate salary and benefits couple with demands from supervisors and a perceived lack of administrative support causes a great deal of unhappiness.

3. Factors Intrinsic to the Job — Too much paperwork, feelings of work overload, long hours and student discipline problems may appear overwhelming.

4. Role in the Organization — Ambiguity regarding one's role in the organization and conflicts in demands from the job are stress inducing factors. Being required to teach out of one's specialty and the perception of minimal authority in one's role can lead to a feeling of not being in control as a teacher.

5. Career Development — Inadequate professional training for the teacher and a poor public image of the teaching profession result in a perceived low probability of reward. Little opportunity for advancement and a lack of job security can also lead to manifestations of stress.

## Suggestions for Prevention

Some specific teacher activities are suggested that hopefully will assist the teacher to cope with stressful situations.

First, a vocational agriculture teacher should discriminate between the concrete demands of the job and those that he/she places on himself/herself. The individual teacher cannot be everything to everybody. Many instructors have unrealistic personal and program goals, thinking it is possible to do all that is asked of them and do it perfectly every time. We need to eliminate this myth of the "Super Teacher" and develop realistic goals and standards based on the local situation and resources available. It is futile to compare ourselves with others in terms of FFA contests won or how many students we have enrolled. Situations are different and cannot be compared in that fashion. Developing more realistic goals and attitudes will contribute to a healthier sense of accomplishment upon achieving those goals.

*(Continued on page 22)*

# Agricultural Mechanization

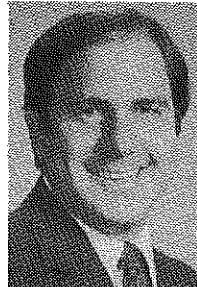
## Watch Out For Those Curves!

Agricultural education programs seem to be in a constant state of change. Everyone appears to be going in different directions at the same time. The eventual success of our programs is dependent upon our abilities to negotiate change. Several months ago while I was attending an auto racing seminar, I was introduced to a phenomenon which forms an interesting analogy for conceptualizing change. The concept that I found fascinating was that even though a road racing course is predominantly a series of straight-aways, you spend the majority of your time in the turns. This is an interesting concept. To explain further, if you were to measure the distances of the straights and turns, you would find that there is a much greater amount of track in the straights. Inversely, if you compare the time spent on the straights to the turns, you spend more time turning than you do driving straight. This is why announcers always seem to say that a car closes upon another going into a corner and then seems to pull away exiting a corner. Actually, the time interval is constant.

At the present time in agricultural education programs, particularly as they relate to agricultural mechanics, we seem to be experiencing this same conceptual phenomenon. At times, we feel as though we are in a constant state of change, that is we are changing directions. During the period of change it feels as though we are spending a great deal of time and not getting anywhere. Also, everyone has closed in on us. Then, when things get straightened out, we seem to be cruising, making great progress, folks are fading behind us in our mirrors, and those ahead of us seem to be getting away. Ahead we see people changing directions, and before we are able to realize it, we too must change directions or go off course, maybe even be passed by those whom we thought were falling behind.

The straight-aways are easy to handle. Your program is moving along, lots of students, excellent community support, good facilities, and everything seems so smooth. You have time to breathe, check the gauges, look in your mirrors (always look in your mirrors), and concentrate on the task ahead. It would be so nice if our programs could exist on only straights, but each year our programs revolve in a circuit. The track may look the same each time, but it is not! The competition is changing each time, year after year, and is getting more intense. It's getting harder to stay in place, let alone, lead the way. Each time around there seem to be more and more programs on the course. There was a time, about seventy-five years ago, when there were only a few programs on the course, and agricultural education was clearly the leader. You would have been hard pressed to find anyone in your mirrors.

Back then we were not going as fast as we are today, therefore, the straights seem shorter than they use to. They are the same length, it is just that we are moving so fast,



By Joe C. Harper, Special Editor  
(Dr. Harper is an Assistant Professor, Agricultural Education and Communications, University of Nevada-Reno.)

that the time interval is shorter. A very interesting phenomenon.

Now, how about those curves? It sure seems that we spend a lot of time changing directions. As we come pounding down the straight, maximum speed, we need to look ahead for the change in direction. What are we looking for? The braking point. That point in time when we must start to slow down. If we brake too early, we waste that valuable straight-away speed, and if we brake too late, we will not be able to negotiate the change. Timing is the critical element. Next, we must select the best point at which to start the change. Our objective is to achieve the change in direction as smoothly, quickly, and efficiently as we possibly can without upsetting the programs. Smoothness is the key, no sudden, jerky movements. Turn into the apex, the center of the turn, which is the indicator that we have changed directions. Students' numbers are now on the way up! Look for the exit point, just as important as the other components. Why? Because it represents the beginning of a straight and that means you can once again accelerate and breathe.

Well, that was only one turn. In our agricultural education programs, particularly the agricultural mechanics component, we are experiencing a great deal of change. How do we manage? I suggest we focus on these concepts.

1. When you find yourself on a straight, go for it. Take a deep breath, check your gauges, look behind you, and then concentrate on the task ahead, because you know change is coming;
2. Look for the change ahead; don't get caught looking in your mirrors and not concentrating. You cannot make a smooth change in your program's direction unless you have planned ahead;
3. Pick your turning point. Even, constant braking is needed. When your program has met the criteria for change, start the turn; don't wait too long. You will miss the apex and may end up off the course, or worse, out of the event;
4. Be smooth. Do not go into the process of change wildly out of control. Upsetting the program will

*(Continued on page 21)*

## Teaching: Building a Climate for Success!!

(Continued from page 14)

Teachers should maintain positive attitudes concerning students' abilities. Teachers need to believe in their students regardless of their ability level, their background, or their previous records, because students look to their instructor for cues about how the teachers assess their abilities. A teacher can trap students in poor achievement if little is expected of them because of their ethnic group, academic labeling, or family background. Therefore, teachers must try to keep an open mind and encourage positive behavior in each student. Helping students realize they can control their fortunes in school by the amount and effort they are willing to expend on their work is an important task.

## A New Era in the Classroom: The Economics of Agriculture

(Continued from page 9)

market prices of agricultural commodities since the early 1970s, very little mention of the role of international markets has been present in vocational agriculture curricula. International influences are two-fold. A substantial portion of American agricultural products are exported to foreign buyers. Without foreign markets, the prices of these commodities would fall drastically. Foreign importers are an important source for demand for American agricultural products. Conversely, increased foreign production and export of agricultural products has contributed to a deterioration of the United States market share. Any student, college-bound or otherwise, should also be instructed

## Agricultural Mechanization Watch Out For Those Curves!

(Continued from page 20)

get you off course. Remember, if you are smooth and on the proper line of the curve, you cannot be passed unless the other programs take the extreme risk of running off the line. If your line is correct, they will not be able to complete the pass.

## Teaching Deserves Our Focus

(Continued from page 3)

the last time you reviewed the principles of learning, analyzed a lesson to check "time on task", read an article on student learning styles or behavior assessment? Hopefully, this issue of *The Agricultural Education Magazine* will help many of us remain current in the primary area of our profession — teaching!

Teachers of vocational agriculture have a heritage of good teaching. High quality teaching in the classroom and

## Conclusion

The teacher plays the most important role in shaping the classroom learning environment. Teachers create the classroom environment by verbal and nonverbal behavior displayed toward the students, and by their professional execution of teaching responsibilities.

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on the importance and influence associated with international markets.

While production of agricultural commodities must never be taken for granted, instruction on all facets of agriculture, especially agriculture's relationship to (and implications for) the rest of the business world needs to be incorporated into the vocational agriculture classroom. Production will continue in some fashion, whether in the form of "family farms" or as corporate entities. Instructing vocational agriculture students on economic concepts will not only improve the future of the student beyond the classroom, but will also improve the future of vocational agriculture within the high school curriculum.

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5. Once you have reached the apex, the change has been initiated, begin to accelerate your program slowly at first, until the exit point and then get on it. Take those students, the new focus of your program, and run.

Do not be intimidated by the changes occurring in our programs. The successful programs will be those which can negotiate the curves.

laboratory, using a variety of techniques, individualized instruction focused on application via SOE, and enhanced by the breadth of FFA incentives has been the hallmark of our profession. Let us never allow this to dilute. As our profession examines itself and looks toward the future with new challenges, and a broader clientele, we must hold on to that which has made our program strong — high quality teaching.

As you read the articles in this issue which provides us with insight, ideas, new knowledge, and added techniques, I hope you, too, will annually "Focus on Teaching".

## Super Teacher!

(Continued from page 19)

Participation in rewarding non-teaching activities is another way of reducing one's vulnerability to stress. Developing interests and hobbies beyond job centered tasks is an excellent means of recreating one's physical, emotional, and psychological faculties.

Development of self-help support groups is also essential to reducing feelings of isolation and alienation from other teachers in the school and other vocational agriculture instructors. Periodic meetings or conferences should be held to consider solutions to problems and identify areas for individual improvement. Such meetings are designed to provide mutual support and encouragement for all involved through communication and sharing among faculty. This type of meeting is especially important in promoting collegial support, reviewing one's commitment to teaching and increasing a teacher's sense of professionalism.

Time management can diminish feelings of not having control in one's teaching situation. This would require one to identify program priorities, set goals for that program, and set aside time for planning classroom, FFA, and SOE activities pertinent to accomplishing these established goals. Adequate planning increases one's self-confidence, lessens feelings of anxiety, and enhances one's sense of control in and out of the classroom. Control starts with planning and planning requires time.

Professional improvement and development activities help decrease the sense of career stall and stagnation. Attending in-service workshops, refresher courses, and professional meetings can provide up-to-date information to keep teachers fresh and informed. Associations with fellow teachers and other professionals creates a sense of belonging and the feeling that the profession is alive and well. Professional improvement gives impetus for trying new methods, new curriculum, and fresh ideas in the vocational agriculture program and decreases feelings that teaching offers no challenge for the teacher.

### Summary

Setting realistic goals, participation in non-teaching activities, developing support groups, time management, and professional improvement are ways of minimizing and dealing with stress. These suggestions in the article are not exhaustive of all possible solutions. What is needed is a continued re-examination of our professional and personal lives to determine problem areas we face and what solutions are needed. Changes that result should be such that public support for teachers is enhanced and teaching becomes a more attractive and satisfying career.

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## Using Personal Warmth

(Continued from page 15)

*"Although commitment and enthusiasm were paramount qualities in each of the teachers I admired most, honesty and fairness was their cornerstone. Student evaluations were based on impartial judgement. Grades were given on the basis of a student's performance and not the teacher's ego."*

5. *Listen to your students.* A teacher who talks all of the time never has an opportunity to hear what students are saying. Listen to students as a good therapist would. Listen carefully and consciously as long as necessary for students to completely express themselves. Be sensitive to the mood of students and learn to sense their moods very quickly. Value their opinions and judge each on it's merits alone. Learn not to be persuaded or intimidated by displays of emotion or aggressiveness.

6. *Develop an atmosphere of freedom to make mistakes.* Perfection is the extreme degree of excellence according to a given standard. Although we strive for perfection, it usually occurs after many hours of study, practice, and hard work. It seems that we are more prone to make mistakes than we are to achieve perfection. Mistakes are ideas, answers, etc. that are wrong; blunder; error. Perhaps our logical excuse for making mistakes is that "To Err is

Human!" Thus, one final step in achieving personal warmth is to be willing to give credit to your students and to accept the blame for failures without being overly dramatic or obvious. Being tough and aggressive about excellence, yet warm, respectful and sensitive toward students, is not a conflict; it is a natural and winning combination in any setting. The key is to help students express themselves.

Obviously, technological advances continue to challenge each and everyone of us and we owe it to ourselves and to our profession to become and remain technically competent. But, wouldn't it be nice if each of us could develop the ability to express personal warmth and become one of those teachers whom every student is comfortable with? Sure it would be nice! Do you think our students would be astonished? Probably.

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# Ten Essential Elements to Problem Solving

(Continued from page 18)

## EVALUATION OF APPROACHES USED TO TEACH HIGH SCHOOL VOCATIONAL AGRICULTURE STUDENTS

This instrument has been prepared to evaluate the approach(es) used to teach high school vocational agriculture students. Please circle the letter that best represents your evaluation of each of the following items. The numbers in the instrument represent the degree to which the item is present in the teaching performance with a (1) representing the absence of the item and a (7) representing a strong presence of the item in the teaching performance.

### TO WHAT EXTENT:

1. Was the instruction organized around solvable problem statements? 1 2 3 4 5 6 7 NA
  - 1A. Was there an answer to the problem statements? 1 2 3 4 5 6 7 NA
  - 1B. Was there more than one answer to each problem statement? 1 2 3 4 5 6 7 NA
  - 1C. Was the problem statement true-to-life? 1 2 3 4 5 6 7 NA
2. Was the problem statement explored by the students? 1 2 3 4 5 6 7 NA
  - 2A. Were a variety of questions used to explore the context and bring out the problem? 1 2 3 4 5 6 7 NA
3. Did the class develop a clear-cut statement of the problem? 1 2 3 4 5 6 7 NA
4. Did students discover possible solutions to the problem(s)? 1 2 3 4 5 6 7 NA
  - 4A. Were possible solutions drawn from the class using key words or questions? 1 2 3 4 5 6 7 NA
  - 4B. Was each solution a potential answer to the problem? 1 2 3 4 5 6 7 NA
5. Did the class discover what factors needed to be considered in accepting a possible solution? 1 2 3 4 5 6 7 NA
6. Did students find and interpret information needed to analyze the potential solutions to the problem? 1 2 3 4 5 6 7 NA

- 6A. Were the class members helped by the teacher to progress toward a solution to the problem "on their own?" 1 2 3 4 5 6 7 NA
7. Were students helped to weigh and process the information gathered to determine its significance to the situation being considered? 1 2 3 4 5 6 7 NA
8. Did the class discuss and arrive at a tentative (assumed best) conclusion to problem? 1 2 3 4 5 6 7 NA
9. Was the solution to the problem implemented under the teacher's guidance? 1 2 3 4 5 6 7 NA
10. Were the results of the solution evaluated and success or failure of the solution discussed? 1 2 3 4 5 6 7 NA

### TO WHAT EXTENT:

### DATA ANALYSIS:

ITEM	SCORE	WEIGHT	ADJUSTED SCORE
1	_____	x .04	= _____
1A	_____	x .02	= _____
1B	_____	x .02	= _____
1C	_____	x .02	= _____
2	_____	x .07	= _____
2A	_____	x .03	= _____
3	_____	x .10	= _____
4	_____	x .06	= _____
4A	_____	x .02	= _____
4B	_____	x .02	= _____
5	_____	x .10	= _____
6	_____	x .06	= _____
6A	_____	x .04	= _____
7	_____	x .10	= _____
8	_____	x .10	= _____
9	_____	x .10	= _____
10	_____	x .10	= _____

### TOTAL

(TOTAL ADJUSTED SCORE/TOTAL WEIGHT) = DEGREE OF PROBLEM SOLVING

# Effective Teaching Requires Marksmanship

(Continued from page 6)

## A DECISION TABLE FOR TEACHING METHODS\*

PRESENTATION METHODS	DOMAINS AND LEVELS						FACTORS AND RESTRAINTS		
	Cognitive		Psycho-motor		Affective		Level of Instructor Expertise	Class Size	Responsive to Individual Needs
	Knowledge	Comprehension	Higher Levels	Lower Levels	Lower Levels	Higher Levels			
1. Lecture	HR	r	nr	nr	r	nr	c	lg	no
2. Indirect discourse	r	HR	nr	nr	HR	nr	c	lg	no
3. Demonstration-Performance	nr	nr	nr	HR	nr	nr	h	sm	yes
4. Readings	HR	r	nr	nr	r	nr	h	Indiv	yes
5. Self-paced CAI	HR	HR	r	r	r	nr	h	Indiv	yes
STUDENT VERBAL INTERACTION METHODS									
6. Questioning	nr	HR	r	nr	r	nr	h	sm	yes
7. Free Discussion	nr	nr	nr	nr	r	nr	n/a	sm	yes
8. Guided Discussions	nr	HR	nr	nr	HR	nr	h	sm	yes
APPLICATION METHODS									
9. Individual Projects	r	r	HR	HR	r	HR	h	Indiv	yes
10. Field Trips	r	nr	nr	nr	HR	r	c	sm	no
11. Simulations	nr	r	HR	r	HR	HR	h	sm	yes
12. Case Studies	nr	r	HR	nr	r	HR	h	sm	yes

\*Adapted from AFM 50-62

Key: HR - highly recommended; r - recommended; nr - not recommended; c - comprehension level (cognitive taxonomy); h - higher level (cognitive taxonomy); lg - large class; sm - small class; Indiv - individual.

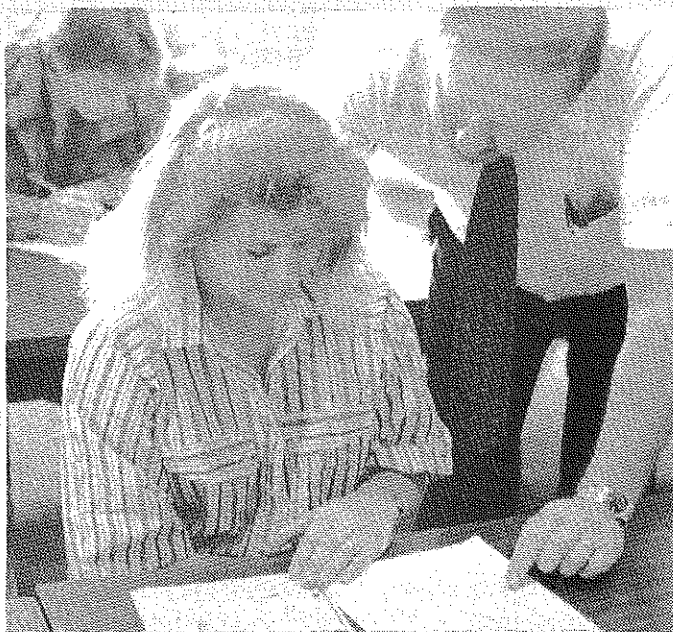
# Stories in Pictures



**Because of the changing demands from the agricultural sector, instructors should utilize all sources of information and instruction including computers. (Photograph courtesy of the Ringwood FFA chapter, Ringwood, Oklahoma.)**



**Students Implement the Solution: A student at Alderson Jr. High, Alderson, WV., is implementing the solution to a problem. Under the guidance of their instructor, Robert Martin, this student is using his supervised experience program to make application of the problem solution. (Photo courtesy of Harry Boone.)**



**Finding and Interpreting Information Needed to Solve the Problem: Students at Parkersburg South High School, Parkersburg, WV., are using a supervised study period to discover information necessary to solve the problem situation. Roger Shaver, vocational agriculture instructor, is assisting a student in her research to find information relevant to the situation. (Photo courtesy of Harry Boone.)**



**Experiencing a Provocative Situation: Students in the agricultural mechanics program at Greenbrier East High School, Lewisburg, WV., have encountered a provocative situation with the repair of this lawn tractor. A. J. Vance, instructor of the program, will direct the learning activities around solving this problem. (Photo courtesy of Harry Boone.)**