

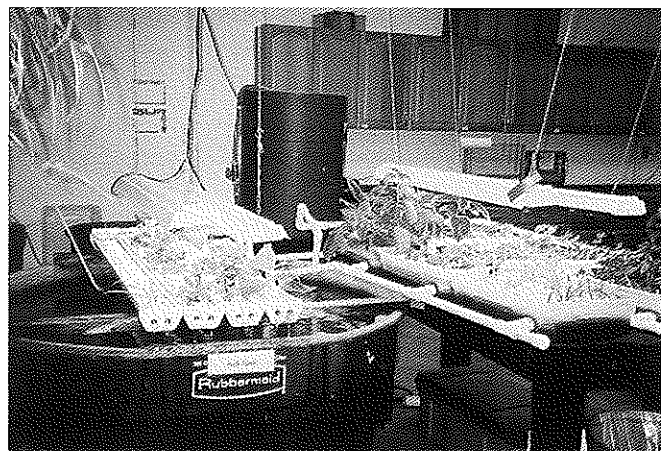
November-  
December  
1999  
volume 72  
issue 3

# *The Agricultural* **EDUCATION** M A G A Z I N E

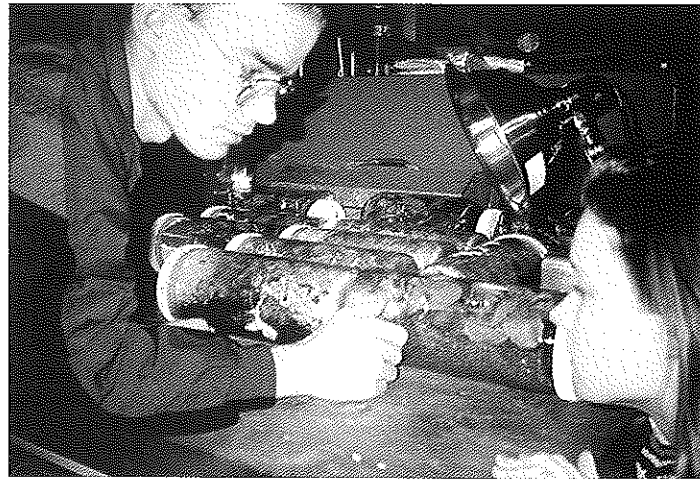
**Is Problem-Solving**



**And SAE**



**Needed in the  
21st Century?**



## Problem-Solving and Supervised Experience for the 21<sup>st</sup> Century

By George Wardlow

"Is there a place for problem-oriented approaches to teaching and for supervised agricultural experiences in Agricultural Education in the 21<sup>st</sup> century?" We could best explore this question with another question, "Is there a place for Agricultural Education in 21<sup>st</sup> century schools without problem-oriented approaches and SAE?"

In preparing for this article, I reviewed the roots of Agricultural Education in the public schools.

Here are a few historical facts that might provide some context for the ruminations that follow:

1. Agriculture was being taught as an organized subject across grades 1-12 (without regard to gender) in many schools long before Smith-Hughes in 1917;

2. When Smith-Hughes was enacted agricultural education was based on the premise that good instruction required grounding in real-world applications with opportunity for hands-on practice.

3. Smith-Hughes required each student in agricultural education to have a supervised experience project for at least six months of each year.

The Smith-Hughes Act was permanent legislation and it has never been repealed. So, using real world "problems" as a basis for instruction and the requirement that every student have a supervised experience is not a matter of choice. It is a legal requirement for a legitimate and approved local program. Interestingly enough, we aren't being held accountable for it.

Another historical fact is that the Agricultural Education program (Smith-Hughes) was a compromise between two different philosophies. Followers of David Snedden and Charles Prosser grouped AgEd with industrial education. This camp wanted to provide youth with work related "training" with specific skills to enter blue-collar jobs in industry. They felt that children should be given skills required by industry to fill jobs needed to advance society. Their focus was on the "needs of society" (read that as the needs of industry). The other camp included followers of John Dewey who felt that education for work should be integrated with general education. These individuals felt that youth should be "educated"

(not trained) in order to empower each individual to reach his/her fullest potential. Agriculture, as an applied science, could provide real-world context in which to base learning across the subjects for many students.

What does this mean for agricultural education? Should agricultural education focus on "training" for specific skills for students to become skilled employees needed by industry? Or should AgEd "educate" students to become entrepreneurs, independent business people, and free thinkers and problem solvers? The Smith-Hughes legislation was a compromise for AgEd. It made us some of both. However, in the intervening years, the influence of the rest of vocational education, placed on us by administrators and legislators has been so much oriented toward the industrial education skills-training model, that we have been unable to resist it. Many of our programs now follow the industrial education-training model. Examples of the result of this influence include: the isolation of AgEd from the rest of the school curriculum (in many schools); a focus on skills training; and the fact that many AgEd students today really do not have meaningful supervised experiential education activities outside the classroom.

Now, let's move on to the really important question. How could one teach agriculture, and the science that agriculture really is, without basing each lesson and each activity taught on real world problems and experiences? Why would one want to try? I often ask teachers and university AgEd majors what course students really enjoy the most. Answers typically include those "in the shop." Teachers also tell me that they "could fill six classes per day of welding, but I have a hard time filling one class of animal science." Why? Why do students choose welding over animal

*(continued on page 5)*

## Theme: Is Problem-Solving Teaching and SAE Needed in Agricultural Education in the 21<sup>st</sup> Century?

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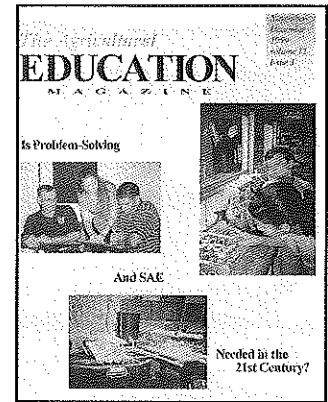
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### Subscriptions

Subscription prices for *The Agricultural Education Magazine* are \$10.00 per year. Foreign subscriptions are \$20.00 (U.S. currency) per year for surface mail, and \$40 (U.S. currency) foreign airmail (except Canada). Single copies and back issues less than 10 years old are available at \$2 each (\$3.00 foreign mail). All back issues are available on microfilm from UMI University Microfilms, 300 North Zeeb Road, Ann Arbor, MI 48106. UMI University Microfilms telephone number is (313) 761-4700. In submitting a subscription, designate new or renewal and provide mailing address including ZIP code. Send all subscriptions and requests for hard copy back issues to the Business Manager: Rosco Vaughn, Business Manager, National Council for Agricultural Education, 1410 King Street Suite 400, Alexandria, VA 22314, Phone 800-772-0939.

### Article Submission

Articles and photographs should be submitted to the editor, regional editors or theme editors. Items to be considered for publication should be submitted at least 90 days prior to the date of issue intended for the article or photograph. All submissions will be acknowledged by the Editor. No items are returned unless accompanied by a written request. Articles should be typed double-spaced, and include information about the author(s). One hard copy and one electronic copy of articles should be submitted. A recent photograph should accompany the article unless one is on file with the editor. Articles in the magazine may be reproduced without permission.

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### Publication Information

*The Agricultural Education Magazine* (ISSN 073224677) is the bi-monthly professional journal of agricultural education. The journal is published by the Agricultural Education Magazine, Inc. and is printed at M&D Printing, 616 Second Street, Henry, IL +61537.

Periodicals postage paid at Mechanicsville, VA 23116; additional entry at Henry, IL 61537.

POSTMASTERS: Send Form 3579 to Rosco Vaughn, Business Manager, 1410 King Street Suite 400, Alexandria, VA 22314, Phone (800)-772-0939.

# Systems Approaches to Supervised Experience Activities

By Penny S. Haase Wittler and Joe G. Harper

Supervised experience programs make differences and may provide new horizons for all students. The nature of supervised experience is to provide applications of instruction beyond the formal learning environment of the classroom and laboratory. We sometimes seem more concerned about whether supervised experience "follow the rules" and will fit in a record book than whether it is of interest and benefit to students. We will attempt to provide a couple of potential supervised experience learning activity strategies which may not fit into the traditional way of thinking about supervised experience activities.

## Team Activities

One of the first areas that should be addressed for enhancing supervised experiences is the use and incorporation of team activities. Traditionally, supervised experience programs have been generally considered as individual projects. It seems appropriate that many students would benefit from the cooperation that would occur with team projects.

Many work and "real world" experiences for our program completers will involve being able to work effectively with others. We need to provide opportunities for students to work cooperatively together on learning activities in supervised experience programs.

## Alternative and Specialty Products

The production and marketing of new alternative and specialty products in agriculture is by no means an innovative idea. However, there seems to be renewed interests in

exploring these types of products. In the past our attention has been toward alternative and specialty crops and livestock enterprises. We need to continue to pursue these innovative alternatives and specialties, but also consider alternative and specialties in areas such as landscaping, recreational areas, small business activities, and many other non-traditional areas in agriculture.

## Internet Activities

One of the greatest areas of potential supervised experience activities is working with students who are interested in computer technologies and Internet services. It seems as though many students are already actively involved in webpage development, helping other students, and actively learning to use these technologies.

As far as a supervised experiences activity, it seems as though there could be a variety of possible activities. A possible example would be where students develop an appropriate website, and monitor the usage of the site. In addition students could become actively involved in the development of educational sites, manage a webboard, or work with email distributions. It seems as though such skills are already in demand and needed in industry and education.

## Research and Science-based Activities

Science-based supervised experience projects have been growing in scope. Agriculture education students have been developing, conducting, and reporting the results and findings of their supervised agriculture experi-

ments. The primary means for the utilization of these types of projects has been for students to participate in events such as science fair activities. It may be appropriate to consider new, expanded approaches to using science-based research projects as viable supervised experience programs.

One such approach would be to actually conduct a research grant program in the local school or through several schools. Students could write and submit proposals for consideration for funding. Donors or research sponsors could be used from the local area. Care should be taken to insure that appropriate policies and procedures for conducting small research projects would need to be established and followed, but the opportunities provided could be very significant and be of interest to students who wish to pursue careers in the sciences and technologies.

## Innovative Technologies

As with alternative and specialty products, we need to consider innovative technologies beyond plant and animal applications. There has been considerable interest among educators for developing GPS instructional programs. Where do GPS supervised experience activities fit? How can students foster their interests in GPS through supervised experience activities? We seem to fall back on the concept of having a project, but why not allow students to map a recreational area using GPS type technologies?

The computer and electronic technology areas are an obvious area of possibilities. We seem to take these types of technologies and turn them into "building a trailer" project. However much could be obtained from students applying existing technologies to a problem-solving situation. Many of the basic electronic sensors can be applied to situations

with existing software and basic electronic components and even some commercially available kits.

## Systems Activities

Many of us would generally consider supervised experience programs as highly specialized learning activities. It is becoming increasingly significant that we provide supervised experience activities that do the opposite, where students pursue activities that are holistic in nature and scope. The overall goal is to have students be able to see the "whole picture."

There are many holistic situations, which emerge from agriculture. These systems include areas such as integrated pest management systems, lawn care systems, water management systems, waste management systems, and air quality systems. Increasingly, it seems as though students of agriculture will need to become "systems thinkers." Supervised experience programs may be a very appropriate instructional strategy to get learners to think and develop more holistic approaches.

## So What?

Maybe we need to recognize supervised experience activities that may not look like what we traditionally think of as supervised experience projects. In order to keep pace with the changes that are occurring in our instructional program we need to take a holistic approach to what supervised experience can do for our students. Supervised experience is indeed for all students and has application if we use systems approaches.

*Ms. Penny S. Haase Wittler is a Teaching Associate in Agricultural Education at University of Illinois, Urbana, IL. (no photo)*

*Joe G. Harper is a Professor in Agricultural Education at University of Illinois, Urbana, IL. (no photo)*

## Problem Solving and Supervised Experience....

(continued from page 2)

science? The answer is less about the content of the course and more about how it's taught.

As teachers we tend to teach how we were taught. That's a fact of life that I, as a teacher educator, constantly try to overcome. Remember how you (with some exceptions) learned the content of the "shop" or laboratory courses. It was probably in a lab setting. There was lots of hands-on activity and you worked toward creating some product that had practical application in the real world. You may have even built something that you could take home and immediately put to use. As you remember it, there was little "theory" taught (a different concern of mine that I will save for a later discussion) to get in the way of the "fun stuff." Now remember how you learned (again, with some exceptions) the content of the so-called "agricultural science" courses like animal science or even agri-business management. These courses were probably characterized by lots of "book work," note taking, and seat time. You probably learned this content in college courses that were largely lecture-oriented. So in turn, how do we teach these things? The way we learned them!

My only question is, "Why?" If we know our students prefer to learn by hands-on, experiential, real-world problem-solving activity, why do we teach some courses like this but continue to teach other courses by lecture and note-taking? If teaching by hands-on, experiential, real world problem-solving activity is good for welding, why isn't it good for animal science? The fact is, it is good for animal science or agri-business management or ... anything!

Here is my recipe for Agricultural Education to remain viable in the 21st century:

◆ We must provide students with an "education," not merely skills "training."

◆ Education must be integrated with the rest of the school curriculum, and it must be based on real-world problems.

◆ Students must be given the thinking tools and opportunities to explore these problems and to create solutions that bring together the knowledge and skills that they have learned in all of their schooling and their experiences.

◆ Students must be expected to have out-of-class time experiential education activities that can provide a basis for in-school, in-class problems to solve.

◆ Agriculture teachers must hold each and every student responsible for maintaining such an experience and they must supervise these experiences.

◆ Instruction in agriculture must be about the science of agriculture, and about students pursuing careful scientific inquiry into real problems in agriculture, not about teaching a set of specific manual skills that quickly will become dated and that even industry isn't asking us to teach.

*George Wardlow is Professor of Agricultural Education at University of Arkansas, Fayetteville, AR.*



# SAE for Y2K

By William G. Camp

The real old timers in agricultural education will remember what we now call SAE as the Supervised Farming program, which became the Supervised Occupational Experience Program (SOEP) in 1972. The term SAE has been in use only since 1992 but it seems that every few years, we need to "re-think" how we do business in our profession. *The Agricultural Education Magazine* has included many articles over the past few years advocating new ideas and new configurations for SAE.

About a year ago, the National Council for Agricultural Education commissioned a study to "Reconceptualize SAE." To get started, we identified a panel of "experts" on SAE, made up of 10 teachers, 10 state supervisors, 10 teacher educators, and 10 friends of agricultural education. We surveyed the panel members 4 times over a period of almost a year using a research process called the Delphi Technique. For anybody who is interested in the full research report, it will be presented at the National Agricultural Education Research Conference in Orlando this December. The following is an overview of the results of that study.

We first asked whether a program like SAE is still relevant to agricultural education. The panel was in unanimous agreement that some sort of supervised agricultural experience is a vital part of any comprehensive agricultural education program. They felt that agricultural education should retain a strong emphasis on an integral, experiential program component designed to provide contextual application of in-class instruction.

We then asked what we should call the program. The experiential component of agricultural education has undergone several name changes over the past 90 years. Another name change would also send the message that leaders in Agricultural Education are unsure about the future of SAE. The panel said that the name "Supervised Agricultural Experience" should not be changed again now.

We next asked whether the definition of SAE needs to be changed. The panel recommended a new shorter definition that broadens SAE and makes it more flexible. The new definition they recommended is this:

SAE is the planned, supervised application of agricultural principles and concepts. SAE opportunities

should serve to improve agricultural literacy and skills and abilities required for careers in agriculture.

Finally, we asked how SAE should be structured. As you may recall, the *SAE Experiencing Agriculture* handbook published by the National FFA lists three basic types of SAE: Entrepreneurship, Placement, and Exploratory. The panel members felt that limiting SAE to those three types was too restrictive and recommended going to eight categories. The following are the eight types of SAE that the panel recommended, a brief description of each type, and some sample activities or projects that typical students might undertake.

## Supervised Agricultural Experience is a Vital Part of Any Comprehensive Agricultural Education Program.



Photo provided by George Wardlow, University of Arkansas

## Types of SAE and Examples of Activities

1. **Agribusiness Entrepreneurship.** Student sets up and operates a non-farm, agriculture-related business on a for-profit basis.
  - Operate a lawn maintenance business
  - Operate a roadside fruit market
  - Construct and sell mailboxes
  - Operate a custom plowing and planting business
  - Sell and deliver landscape mulch and gravel
  - Operate a snow plowing business
2. **Agricultural Production.** Student produces agricultural products for sale or use in an entrepreneurial role.
  - Grow and sell poinsettias in parent's greenhouse
  - Raise feeder pig for home use
  - Grow a field of pick-your-own strawberries
  - Grow an acre of corn to feed to steer
  - Grow five acres of wheat for sale
  - Run a pay-to-fish operation
3. **Agricultural Placement.** Student works for others to develop career skills in agricultural or environmental areas. Work can be paid or unpaid, may or may not involve academic credit and may or may not involve released time from school.
  - Work in produce department of a grocery
  - Work at a garden center
  - Perform regular, scheduled volunteer work for a community agency
  - Work as an apprentice in a landscaping company
  - Work in a farm supply store
4. **Agricultural Exploration.** Students engage in activities designed to expose them to agricultural careers and the world of work.
  - Serve an unpaid internship in a veterinary clinic
  - Interview a series of local agricultural businesspersons
  - Shadow the managers of several local agricultural businesses for a day each
  - Prepare a resume and participate in mock job interviews in several actual businesses
  - Prepare a research portfolio on an occupation of interest
5. **Agricultural Research.** Students conduct carefully planned, recorded, and analyzed projects involving either original or library research tied directly to their career or academic goals.
  - Conduct a study to compare fertilizer loss rates for varying application rates
  - Prepare a history of agriculture in the local community
  - Prepare a county agricultural survey using census information
6. **Directed School Laboratory.** Student conducts activities in school laboratory setting, beyond the scope of routine in-class work.
  - Develop a comparative analysis of agriculture in some other part of the world to that in your community
  - Monitor stream water quality and plan a remediation program if needed
  - Conduct field trials for different fertilizer rates on turf grasses
7. **Agricultural Communications.** Student uses mass media to communicate messages regarding agriculture to the public.
  - Grow and sell poinsettias in school greenhouse for a share of the profit
  - Build lawn storage buildings in the agricultural mechanics laboratory as a fund raising activity for the agricultural education department
  - Maintain an apple tree in the school orchard for a share of the profits from sale of the apples
  - Establish a student agricultural cooperative for sale of farm services and products
  - Plan and install landscaping for one portion of the school grounds
  - Set up a small engine repair clinic after school hours for local home owners using the agricultural mechanics laboratory
  - Develop a promotional video of FFA activities
  - Record a 30-second radio spot announcement promoting National FFA Week
  - Prepare an agricultural education department portfolio for use in recruiting students
  - Publish a monthly newsletter for the agricultural education program
  - Create and maintain an FFA chapter web site
  - Create a display for the county fair promoting agriculture and agricultural products
8. **Improvement Projects.** A series of related activities requiring a relatively long period of time and effort designed to increase the value of the home or business; improve the environmental conditions of the home, business, or community; or improve farm or business practices.
  - Paint the home
  - Set up a computerized system for business records
  - Build runoff diversion ditch network for a field
  - Design and install home landscaping
  - "Adopt-a-Park"
  - Construct a storage building for farm or lawn equipment.

William G. Camp is a Professor of Agricultural Education at Virginia Tech, Blacksburg, VA. (no photo)

## SAE for Science

By Eric Zilbert

One type of project with tremendous potential for development is the research based SAE. As coordinator of the Agricultural and Environmental Science Fair held each year at the University of California at Davis, I have seen many excellent projects conducted by agriculture students. One of the key distinctions which needs to be made in the development of a science fair project is the difference between a demonstration and an experiment. Often, students will perform an experiment that demonstrates well-known scientific principles. While this is valuable and instructive, it is not representative of the type of research conducted by professional scientists. Many may say that we cannot expect high school students to design and conduct research that yields new knowledge; however there have been a number of projects in the science fair which have done just that. In this article I will share some examples and explore the type of support required for students to be successful in this area.

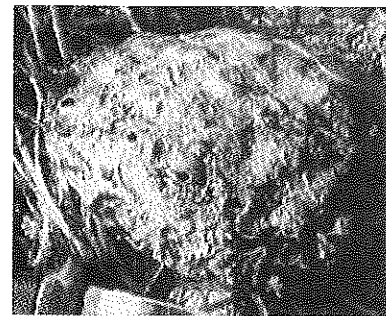
### Marine Science at Fort Bragg

Fred Rubin teaches agriculture in Fort Bragg, California. A unique component of the program is the marine science laboratory. A 24' x 40' indoor facility offers approximately 4000 gallons of refrigerated salt and fresh water tanks, ultraviolet sterilizers, and twenty-four individual workstations. An outdoor facility includes 5600 gallons of tanks for research. The facility was designed from the beginning with the intention of supporting research activities, not fish production. While production projects do go on at the site, the ability to do replicated research has led to

some very successful projects.

Because of this unique facility, the students at Fort Bragg have the opportunity to conduct very interesting and useful studies involving aquatic organisms. Project ideas often come from members of the Department of Fish and Game. How much abalone does a certain type of fish eat? What kind of adhesive works best to attach labels to abalone? What kind of diet makes a sea urchin grow the fastest? Can we determine squid populations based on the population of certain predator species?

This is genuine, applied (empirical) research that is interesting and exciting because it involves the best part of science, making discoveries. Let's take a closer look at a couple of the projects.



*The project required understanding abalone growth, development, culture and the development of dissection and measurement techniques.*

### How big an ab?

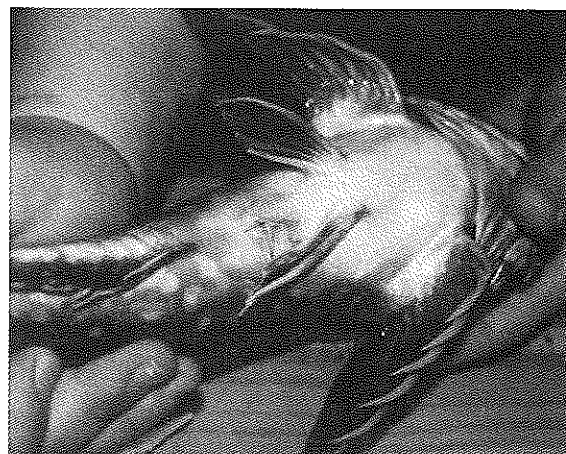
Abalone are an important game species in northern California. Harvest is carefully controlled to protect the abalone populations. Of course other animals also eat abalone, among them is a fish known as the cabazone. The cabazone is a large salt-water fish. The California Department of Fish and Game found in inspecting the stomachs of cabazone caught by fishermen that the radula (mouth part) of the abalone was not digested. They wondered if

they could tell the size of the abalone eaten by the cabazone based on the size of the radula. If this were possible, they could then better understand the age of the abalone they preyed upon.

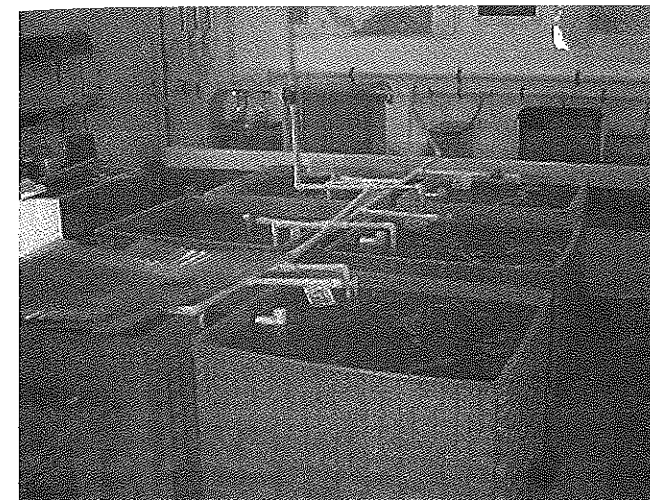
Brandon Wethers took on the project. He compared the size of the radula of abalone with the length and width of their shells. The study showed a limited correlation between radula size and abalone size. This project required the students to understand abalone growth and development, the requirements of abalone culture, and the development of dissection and measuring techniques.

### Tracking Fish

Another problem from the California Department of Fish and Game: How to insert transponders into fish for tracking their movements? Student Don Powers is working on the use of adhesives to close cuts made in the fish to insert the tracking devices. He captures fish, anesthetizes them, makes the incisions, inserts the device, and glues the fish back together. Fish are then observed to determine the length of time the adhesive keeps the fish intact. Data are still being collected,



*The fish are observed to determine the length of time the adhesive keeps the fish intact.*



*This year's project includes testing the release of carbon dioxide as a means of stunning fish.*

but Nexaband combined with Superglue seems to be the best adhesive to date. The skin of the fish actually healed as a result of this treatment.

This year's projects include testing release of carbon dioxide as a means of stunning fish, and a study comparing the behavior of farmed abalone with that of wild abalone. The projects keep coming and the students at Fort Bragg benefit, as does the Department of Fish and Game.

### Using Other Facilities

You don't have to have research facilities on campus to get students involved in real projects. Chris Dickson teaches at North High in Bakersfield, California. Her students work with the Kearny Agricultural Research and Extension Center of the University of California to design and conduct research projects. Scientists at the Center work with students as mentors, helping them to develop and carry out applied research. Her student Chris Black conducted a study of the geographic distribution of California red scale resistance to pesticides in California. His work made an important contribution to our understanding of this important citrus pest. Chris was the California Agri-science student of the year in 1998, and went on to be the first runner up for the national title.

Another Agriscience student of the year from California is Rhonda Hamm. She is a student at Central High School in Fresno, California. Rhonda examined the ability of different chemicals to repulse ants that tend scale insects on citrus trees. She worked with entomologist Dr. Harry Shorey of the Kearny Center to develop and conduct her research.

### The Effects of Fire

Yet another example comes to us from Petaluma, California. Following a large brush fire range scientists in the California Department of Forestry wanted to know how well various plant species re-established themselves after a fire. Students were able to follow burned plots of different slopes and exposures over an extended period of time. They provided valuable information needed to make decisions about re-vegetation following fires.

### Common Factors

Several factors seem to be important: good facilities, source of ideas, sources of design assistance, and strong teacher support. Note that in all of these projects students are faced with a multitude of problems to solve with respect to study design, instrumentation, data collection, and

data analysis. Besides being educationally robust, the students will tell you that their project was a major highlight of their high school experience. The participation and support of a trained professional can make all the difference when it comes to selecting and implementing a research project. Sources include: state and federal agencies, resource conservationists of your local Resource Conservation District, University faculty, extension specialists, and farm advisors. These people can also help in the design of on campus facilities to support research, or in the identification of off campus facilities.

To be interesting to students the project should have fairly practical goals. Often, empirical studies such as those described above do not get sufficient support from the scientific community which is generally more interested in the development and confirmation of theory. Empirical studies are perfect for students and teachers who want to get involved in the "doing" of science.

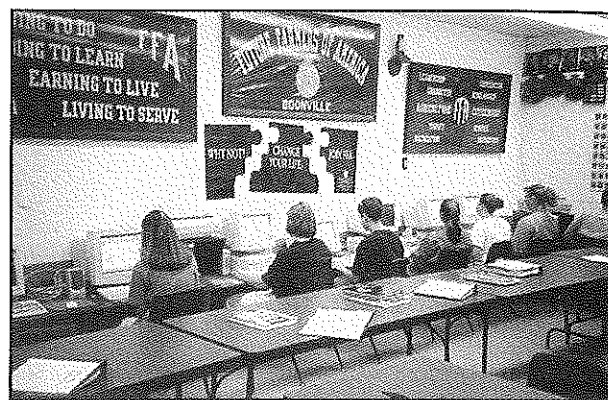
### Conclusion

Science education has long struggled with the question of whether science is about processes or facts. Many have complained that Ag. Science courses tend to focus on lectures and facts rather than student projects. The student research SAE bridges this gap by providing authentic activities that engender problem solving while teaching the processes of science and solving important practical problems. What more can one ask from an SAE?

*Eric Zilbert is Associate Professor at University of California at Davis, CA. (no photo)*

# SAE Is Problem Solving!

By Vance Keaton and Brad King

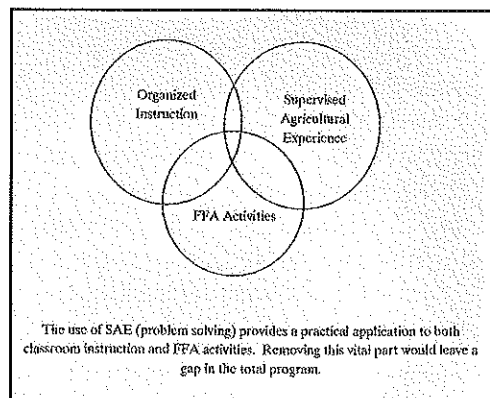


Throughout the Agricultural Education profession, the term problem-solving<sup>2</sup> has been associated with a method of teaching, found only in the classroom or laboratory. But let's for a moment look outside the walls of the classroom and see if problem solving is found in the third component of our programs, Supervised Agricultural Experience (SAE). If we look at the history and definition of problem solving, we find that SAE is problem solving in its purest sense.

Problem-solving teaching has an extensive history in Agricultural Education. In the early 1900's, John Dewey first wrote of the methods that have become known as problem-solving teaching. Dewey supported learning centered on students and their own experiences. Numerous authors since have studied and clarified the topic, including Stewart in 1950, who described problem-solving as an approach to learning and teaching that implied involvement in discovering solutions to problems directly relevant to the needs of the learners. Stewart firmly believed that for students to be interested in learning, they had to be engaged in thinking and solving problems that applied to their own situation. Simply put, students should solve problems in their own lives and context. In 1952, Phipps stated that "if departments of vocational agriculture cannot give their students the ability to solve the problems they meet, they are not providing agricultural educa-

tion." Whether in 1917, or in the 21st century, SAEs have always been, and should always be, a part of a student's life and learning.

SAE programs have long served as a cornerstone of an agricultural education program. As seen and taught by many, the three-circle (Venn) diagram of an agriculture program demonstrates the importance of SAE to our programs. The three circle diagram illustrates how the different components of our programs interrelate, allowing for the application of knowledge outside the classroom, and providing for an opportunity to learn outside the walls of a classroom, to be brought back to the classroom setting.



Through the years, a number of researchers and writers have defined problem solving with minor variations. Pertaining to SAE, Hammond (1950) perhaps described the model of problem solving that most accurately reflects activities occurring within and

around SAE programs. The six steps proposed by Hammond were:

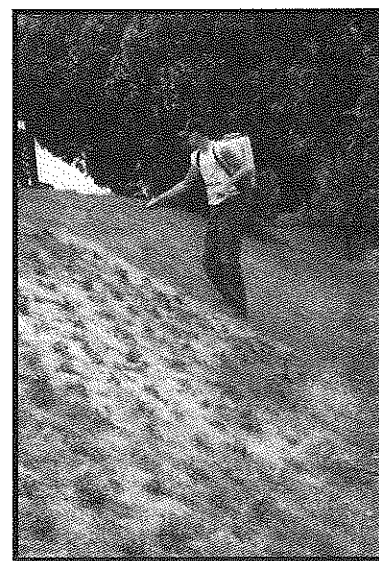
1. Discover the difficulty in a situation
2. State the problem
3. Analyze the problem
4. Find the information to solve the problem
5. Pool the findings and decisions and arrive at a solution
6. Do what remains to remove the difficulty.

On an almost daily basis situations arise that literally force students to employ problem solving in their SAE. Generally students already utilize problem-solving techniques, whether they label it as problem solving or not. What follows are but a few examples observed by the authors over a period of years where problem-solving was observed in SAE, and the importance of problem-solving to that student's SAE success.

While teaching at Stevensville, Montana, King had a number of students involved in the timber industry as part of their SAE. Due to the reduction of acres logged, timber SAEs needed to diversify. One of King's students evolved his SAE, with his father's help and encouragement, into an SAE that focused on building log homes. The student's family decided to build a log home of their own, both because the family needed a larger home, and for the sheer advertising power of the home. Since the father of the family was so busy with the business of buying and selling

house logs, the building of the home was left largely up to the three oldest children - all teenagers. With moderate assistance from the father, a new log home was built - over 3,500 square feet on the ground floor, with several lofts. Did problem solving sneak its way into this SAE? Definitely! From start to finish, this agricultural student and his family had to analyze countless problems and find solutions. The student's efforts on the home and other timber enterprises enabled him to earn a national gold (non-finalist) proficiency in Forestry Production.

Another student of King's worked for a local rancher, in agricultural production placement. The owner of the ranch not only was concerned with his own land, but also leased several other ranches. The agricultural student worked in all aspects of the ranch, including hay production, working livestock, and mechanics. At one point in time, the owner of the ranch realized that upgrading and modernizing the ranch's irrigation methods would prove beneficial. Due to the limited rainfall in Montana, water is the most precious agricultural resource, and is almost always the



Student prepares hillside to eliminate mowing. This type of SAE presented many problem solving opportunities.

limiting factor to production. The owner trusted the high school agricultural student enough to allow him to research the problem, analyze the options, and even purchase with ranch money the irrigation equipment needed to accomplish the task on several hundred acres. The student maximized return to the ranch on a reasonable investment of money. This student was also a national gold (non-finalist) proficiency winner in Placement in Agricultural Production.

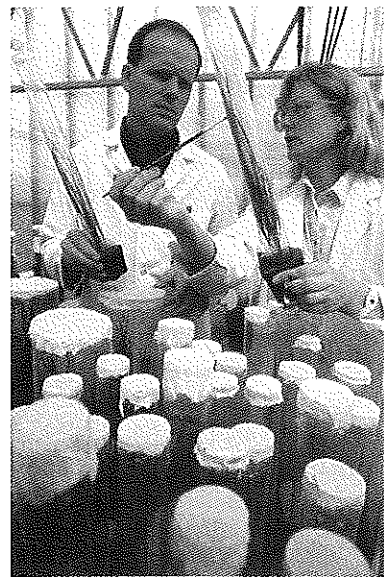
The two students that King has mentioned are in all accounts outstanding agriculture students and FFA members. Keaton, who teaches in the central part of Missouri, gives examples of "average" students that are present in every chapter. The first student came from a traditional farm family. He wanted to start a swine SAE program so he went to the bank, presented his plan, and asked for a loan. This started out to be a very traditional SAE; however the price of hogs dropped shortly after getting involved (he sold one group of feeder pig \$0.05/lb). On a SAE visit while discussing his plans, the student mentioned that he was not making any money and his part time job had to pay the feed bill. The student then continued to tell how he liked the plant science unit that had been taught in class and that he was interested in landscaping and greenhouse work. In the next few weeks he mapped out a plan to sell the hogs and start the process over again at the bank. This time, however, he bought a greenhouse. He and his father constructed the house. The greenhouse is in full operation and he has been using it as a retail house for selling bedding plants and houseplants in the summer. That same summer he started a full service landscaping business. He now has 15 to 20 customers and a contract pending for a multiple stage retaining wall. He uses his problem-solving

skills daily to determine what to plant at each site, how to charge for his services, and how to market the item he has for sale.

A second student of Keaton's has a SAE project sheep production. The student is responsible for the caring, feeding, and managing reproduction of the family's 100-ewe flock. She selectively plans the breeding program for individual ewes, and breeds them to different rams that the family owns in order to emphasize various genetic traits. She is responsible for the feeding program in which she must calculate and adjust the contents and amounts of ingredients depending on the time of year. She also modifies the grain to meet the needs of each group she is feeding and calculates which feed additives are the most cost efficient. The young lady is also responsible for the health care needs of the flock including annual preventative medicine as well as castrating, treating dystocia and rectal prolapses, caring for neonatal lambs, and walking the show lambs each day.

Keaton says all of his students have SAE programs. Some are as traditional as beef cattle while others are non-traditional projects such as raising mushrooms and rhubarb plants. All SAEs have problem solving intertwined in them. Keaton brings that problem-solving approach back to the classroom. With all SAE visits, he takes notes and asks students what are some of the problems they have experienced; he then takes these problems and adapts them to classes he is teaching. The students can then use the Agriculture room library or one of the classroom computers to help find solutions for the problem at hand. This serves two-purposes: First, it causes the students to think, and second it gives them a reference point

(continued on page 24)



## The Never Ending Circle of Problems and Solutions

By Ed Osborne

"Problem" - a question, matter, situation, or person that is perplexing or difficult (Guralnik, 1982). Given this definition, it seems likely that problems will always be present in the agricultural and natural resources industries in the 21st century and well beyond. A situation becomes a problem when those involved are confused or uncertain as to a best, or even reasonably effective, solution. If major problems are not addressed, they usually persist and often grow in scope and complexity. Even if today's problems could be solved, newer and more complex ones will continually replace them.

### Problems Created by Solutions

Although science and technology have created a society of unparalleled abundance, our land of plenty includes plenty of problems. Many of today's problems are extremely complex and have often been created by solutions of the past. A perfect example is the use of chemicals to control plant and animal pests. While these solutions have been extremely effective, they are now under growing scrutiny because of concerns about water quality, food safety, and the

sustainability of our agricultural lands. New concerns are now surfacing about the resistance of plant and human pests to biochemical controls. Containment animal facilities developed over the past 30 years have increased profits, production, and efficiency, while reducing land investments. Today, problems with waste management and water pollution are at the forefront of citizen concern with these operations. Higher levels of fertilization have helped produce record yields but have raised concerns about soil depletion and overall sustainability.

The same analysis could be applied to society at large. Astonishing growth in the service sector has kept the unemployment rate at an all-time low, but many working, fully employed Americans are living in poverty because service sector wages are so low. Technology has invaded the entertainment industry and our daily routines with unbelievable applications, creating a society that prefers to be entertained by others and seems to have forgotten how to find pleasure in the people and environments that

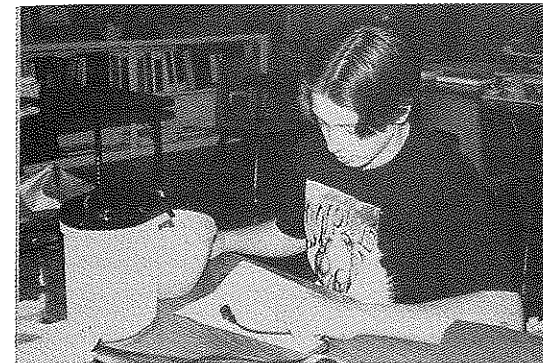
surround them. More Americans than ever are at work, pushing personal income levels higher and higher, while record numbers of families and individuals are suffering. Each of these situations suggests that problems and solutions are contained within a complex, never-ending circle.

As long as new problems continue to be created with the solutions to previous ones, creative problem solvers will be needed. In addition, new problems will arise on their own that will also require effective problem responses. How can agricultural education assist? If agricultural educators can assist youth and adults in becoming effective problem solvers, then perhaps agricultural education can have a positive impact on the agricultural industry and on the quality of life for many individuals. By helping students acquire effective problem solving and decision making skills and teaching them how to draw on these abilities when confronted with problems of any type, agricultural educators can clearly make a difference.



### Problem Solving Ability Needed

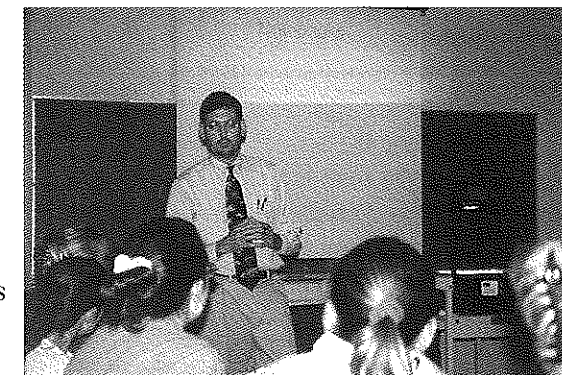
Today's learning environments have reached an apparent conflict between problem solving and information dissemination, between abstract and concrete learning, between concepts and applications. School-based agricultural education programs have been caught right in the middle of this tug of war. On the one hand, agricultural education has sought to be



more like it's major curriculum counterparts, which aspire to a subject matter orientation that conjures up notions of greater rigor. On the other hand, agricultural education has sought to retain its focus on using knowledge and information to create practical solutions to actual, often complex problems. Problem solving as a creative business process is viewed as a prestigious, highly respectful endeavor, while ingenious solutions that solve large and small problems in the everyday business of agriculture are often overlooked or taken for granted. Ironically, the information explosion has further heightened an emphasis on learning facts and concepts, while the burgeoning knowledge base seems to be begging for the world's thinkers to tap into its problem solving potential.

Good communication skills and problem solving ability are often cited as among the most desirable traits in today's college graduates, particularly for positions in the agricultural industry. In fact, professionals at all level in the public and private sector face situations nearly every day that require sound problem solving ability. This may involve diagnosing a plant or animal health problem, analyzing a drop in product sales, developing a new strategy or product to better meet the needs of clients, or discovering a more effective way to bring about a change in client behavior. Problem solving is the heart and soul of research programs conducted by

university and private sector scientists in all fields. Clearly, effective problem solving will remain a highly valued skill, but is it a skill that can be taught, and does use of a problem solving approach to teaching hold any promise of contributing to one's overall problem solving ability?



### Greater Research and Teaching Emphasis Needed

The limited research that has been completed on problem solving as a teaching process in agricultural education suggests that problem solving may offer advantages in boosting student achievement and problem solving ability (Flowers, 1986; Dyer, 1995). Much more research is needed on the merits and shortcomings of problem solving teaching. Agronomy has scientists that devote a lifetime to oat breeding, corn borer eradication, ear development in corn, and many other areas. Likewise, agricultural education needs scientists that devote their careers to the intricacies of problem solving as a teaching and learning process. Until scientists in agricultural education have dissected problem solving to the extent that scientists in horticulture have mastered the flowering process, the full potential of problem solving as a teaching process will never be realized. In addition, these scientists

must become intimately familiar with research findings on the development and teaching of thinking skills in general, and problem solving processes in particular.

Assuming that a research basis for using problem solving teaching does exist, university and school-based agricultural educators must be much more aggressive in developing a sound understanding of problem solving as a process and teaching approach. Teacher educators should model effective problem solving teaching on a regular basis, especially in their teaching methods courses. Teacher education students should leave the teaching methods course with a clear understanding of the process, recognition of its advantages as a teaching approach, and enough confidence and ability to enable them to continue using problem solving in their own teaching.

In a nutshell, present-day problem solving teaching requires that

- ◆ teaching topics clearly derive from problems,
- ◆ students identify the questions that must be answered in order to solve the problem, and
- ◆ students use their own investigative and thinking energies to arrive at tenable solutions to the problem.

Numerous variations and techniques can be very effectively used within this overall problem-solving framework. This writer was fortunate enough to have observed crystal clear demonstrations of problem solving teaching by a professor (Lowell Hedges, Ohio State) and a secondary agriculture teacher (Richard Long, Paxton, Illinois). Models of this type are invaluable as beginning teachers work to master the fundamentals of problem solving teaching.

(continued on page 19)

# Don't Throw the Baby Out With the Bath Water

By James Knight and Jack Elliot

The National Commission on Excellence in Education released "A Nation at Risk" in 1983. The report generated national attention thrusting public education into the spotlight and putting it on the front pages of newspapers all over the country. In response to the report one reform effort after another was introduced into the public schools in an attempt to respond to the public outcry for the perceived lack of quality. Such movements as:

- ◆ "Back to the Basics"
  - ◆ "Outcomes Based Education"
  - ◆ "Coalition of Effective Schools"
  - ◆ "Classrooms of the Future"
  - ◆ "Success for All"
- and others were spawned.

Prior to the national ground swell for reform, agricultural education programs had already undergone some fairly significant changes in an attempt to make them more responsive to the changing needs of a dynamic agricultural industry. The movement to recognize that agriculture was more than just farming and ranching had generated the development of programs in numerous additional technical areas such as horticulture, biotechnology, agricultural business, agricultural mechanics, and natural resources and had begun to move from a production agriculture to an agriscience focus.

Like most everything else in education, nothing is sacred. This year the Agricultural Education Magazine asked the profession to look in a mirror. That is we have been looking

at the way we do business and asking, "Is that the way we should do our business in the 21st century?" This issue is focused on the question, "Are problem-solving teaching and SAE needed in Agricultural Education in the 21st Century?" In this article we will present our rationale for, not only believing that the answer is yes, but that they may be more important than ever before.

## Historical Place of Problem Solving and SAE

While problem solving and SAE are not necessarily synonymous, they are, none the less, closely associated. From the time John Dewey introduced his philosophy about teaching and learning he made a strong connection between learning and doing. With the work of Rufus Stimson, the notions of problem solving and supervised practice became "two sides of the same coin" and were included in the first vocational education legislation, the Smith-Hughes Act.

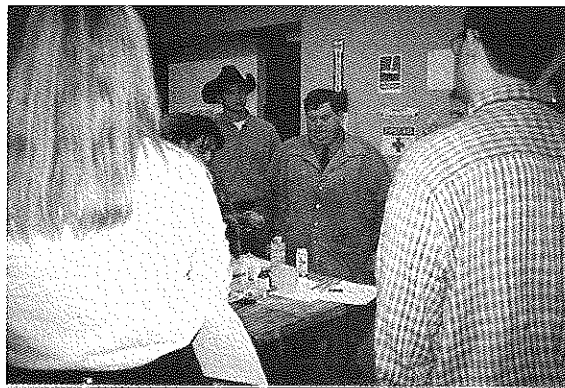
A synopsis of the 1929 Federal Board standards (Maltby, 1929) for supervised practice include: 1.) Activities other than farming should be encouraged; 2.) The student should become proficient in the activity; 3.) The student should perform the activity by him or herself; 4.) Careful plans should be developed; and 5.) Accurate records should be kept. A quick review of these 70 year-old standards reveals that they are pertinent for today's students.

## Current Trends in Education

Schools have been responding to public pressure to get students to score higher on academic tests. This pressure has contributed, we believe, significantly to "subject-matter" based reforms and increased academic requirements. The outcry about any

approach to teaching that appears to take more time and is outside of the regular school day is real. Thus, teaching approaches like problem solving and supervised experience have come under fire. In addition, with the changes in agricultural education programs and school funding across the U. S., supervised experience is often seen as a "luxury" and not a necessity.

We are drawn back to Dewey's logic about what real learning is all about. The writings of Lancelot (1929), Stewart (1950), Krebs (1967), and Newcomb et al (1987) and others are still compelling to us in



All effective supervised experience programs start with good classroom teaching

their clean thought processes and brings us back to a realization that one of the major reasons we have schools is to teach students how to solve problems. High quality supervised experience programs provide students opportunities to apply scientific concepts, to test ideas in real world settings and to explore areas that interest them.

## Conclusion

In reviewing the reforms taking place in schools and the significant changes in the agricultural industry, the pressures to change are real. Holding on to anything that has some "age" on it is often perceived as being too conservative and backward thinking. However, at a time when others (Science for All Americans,



Expanding supervised experience opportunities to include aquaculture is important to the future of agricultural education.

1989) are now discovering and admiring the power of problem solving and supervised experience, we believe we should not abandon them. The use of these tools in Agricultural Education has long been a major strength for us as a profession. With the commitment to supervised experience and the associated home visits, along with deep roots in the notions of "Problem Solving," agricultural education can be as, if not more, important in the 21st century as it has been in this century. In fact, when administrators ask if extended contracts are important, our reply is, "No, they are essential." They are essential if successful supervised experience programs and obtaining problem-solving skills are a priority. If, however, we give up the tools that have made us unique and special, it is our view that agricultural education will be in trouble.

## References

American Association for the Advancement of Science (1989). *Science for all Americans*. A Project

2061 Report on Literacy Goals in Science, Mathematics, and Technology.

Krebs, A. H. (1967). *For More Effective Teaching: A Problem-solving Approach to Teachers of Vocational Agriculture*. Danville, Illinois: The Interstate Printers and Publishers.

Lancelot, W. H. (1929). *Permanent Learning A Study in Educational Technique*. New York: John Wiley & Sons, Inc.

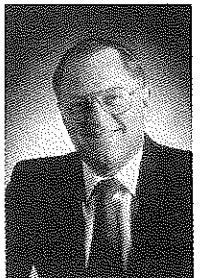
Maltby, R. D. (1929). Standards in supervised practice. *The Agricultural Education Magazine*, v1, p.4.

Ratner, J. (Ed.). (1939). *Intelligence in the modern world: John Dewey's Philosophy*. New York: Random House.

Stewart, W. F. (1950). *Methods of Good Teaching*. Columbus, Ohio: The Ohio State University.

Newcomb, L. H., McCracken, J. D., and Warmbrod, J. R. (1986). *Method of Teaching Agriculture*. Danville, Illinois: The Interstate Printers and Publishers, Inc.

High quality supervised experience programs provide students opportunities to apply scientific concepts, to test ideas in real world settings.



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## The New SAE: Applied

By Neil A. Knobloch

Growing up on our farm in the 1970s has given me many cherished memories of riding in the cab of the tractor with my dad plowing with the 5 - bottom Oliver plow. Sometime in the 80s, the plow was retired to sit in the grove. Dad didn't get rid of the plow because it was occasionally beneficial to his tillage operation, it was still in good shape, and it might be useful in the future.

### Where are We Today with SAE?

Are Supervised Agricultural Experiences (SAEs) becoming fond memories and as useful as our plow in the grove? Supervised agricultural experiences implemented in agricultural education programs by its true definition of students experiencing agriculture with adult supervision have proven to help students apply knowledge, clarify career choices, solve problems through decision making, develop responsibility, and learn agricultural skills through practical experiences. Although many educators agree that SAEs are beneficial to their students, this educational component is often set aside like the old plow in the grove. According to the National FFA Organization (1999), less than half of the students enrolled in agricultural education have SAE programs.

As I reflect on my past seven years of teaching high school agriculture, SAEs have been a valuable component of the total agricultural education program. It took a lot of time, planning, and motivation to develop positive attitudes towards SAEs by my students and myself. Traditional agricultural education programs have served the needs of

their students and communities by focusing on an agricultural production-based curriculum. Therefore, many students had SAEs in production agriculture.

However, today in the 90s we see the opportunities of entrepreneurship becoming more limited in production agriculture (American Farm Bureau, 1995). Moreover, we have seen a growth of enrollment of students with diverse backgrounds and interests (Keith, 1999; National Council for Agricultural Education, 1999). There are fewer students who have opportunities for SAEs in the production areas that have been the norm for over six decades. In 1993, sixty percent of my students enrolled in the Mid-Prairie, Iowa, Agricultural Education Program had production-based entrepreneurship SAEs. By 1998, less than twenty percent of my students had entrepreneurship SAEs in production agriculture. Over eighty percent of my students had SAEs in placement in agricultural careers, educational work experience, exploratory projects, home improvement, and applied research in agriscience. I saw firsthand a need to shift from stressing agricultural production SAEs to SAEs that reflected the changing needs of our communities and career opportunities of our students. I assisted students in developing SAEs that

I saw firsthand a need to shift from stressing agricultural production SAEs to SAEs that reflected the changing needs of our communities and career opportunities of our students

prepared them for their future needs in career areas of agricultural sales and services, natural resources, and horticulture.

### Are SAEs Needed in the 21st Century?

Most agricultural educators would agree that SAEs would be needed in the 21st century (National FFA Organization, 1999). However, we cannot expect that most students will desire or have the opportunity to develop agricultural skills through traditional production-based SAEs. Agricultural education programs need to offer a smorgasbord of SAEs for students in the 21st century. Recently, I heard two conversations about the need for SAEs to be adapted to the changes in the agricultural industry, educational system, communities, and students. One of the last topics discussed at the Governor's Council on Agricultural Education in Iowa before I moved to Ohio was SAEs. One of the first discussions I heard in Ohio at a breakfast meeting was SAEs. Are we ready to promote new SAE options for the year 2000?

### Making SAE Y2K Compatible

Although much hype has occurred about Y2K, I believe that our profession is past due in our assignment to make SAE compatible for agricultural students in the 21st century (Krueger and Hunt, 1991). Based on my experience as a high school agricultural educator, I will outline some ideas on how to make SAEs compatible to the changes we face.

### The Components of SAE

Through my practical experiences, I affirm that there are seven components of SAE supported by Barrick et al. (1992):

1. Students will conduct their SAEs outside of the classroom.
2. Adults such as parents/guardians, supervisors, and agricultural educators will supervise students.
3. Students will develop educational plans for their SAEs that are agreed upon by their agricultural educators, parents/guardians, and/or employer.
4. Students will develop skills that can be transferred to agricultural applications.
5. Students will explore, develop, and analyze career interests in the seven occupational areas of agriculture (Newcomb, McCracken, and Warmbrod, 1986).
6. Students will make an investment of their time and/or money in developing entrepreneurship and management responsibilities.
7. Students will see returns on their investment in (a) education through knowledge and experience, and (b) financial benefits through profits and growth in equity.

### Types of SAEs

There are five types of SAE projects that all students were required to choose from in the Mid-Prairie Agricultural Education Program that were outlined in "A Guide to Local Program Success" by the National FFA Organization (1998):

1. Exploratory Projects such as Job Shadowing or Basic Research
2. Entrepreneurship of Products and/or Services
3. Placement in Agricultural Employment and/or Educational Work Experience
4. Applied and/or Scientific Research in Agricultural Sciences
5. Home and/or Community Improvement Projects.

### The New SAE: Applied

I field tested an educational project regarding SAE with a non-traditional agricultural class. The class was a science class called, "Environmental Studies." I adapted the class to be considered as a dual science and agricultural class by restructuring and renaming it, "Environmental Science." Every student in the class signed up for the science elective class. However, I incorporated agricultural content and an SAE component into the class, which qualified it as an agricultural class.

I named the SAE component in environmental science, "The Independent Environmental Science Project." In this assignment, the students selected a project from a list of approved ideas, which I provided, to conduct exploratory research or educational work experience. For example, students conducted water tests throughout a watershed of a ten-

mile radius; another student created a manure management plan for the hog farm where he worked; and others created weed, native plant, or tree collections. Students developed an educational plan that was agreed on by their parents/guardians. The projects were conducted outside of the classroom and students documented their time and progress by keeping journals, writing a report, and presenting the results of their project. A rubric was used to evaluate the individual student's performance and project. The educational results of this project were outstanding. Twenty-two of twenty-eight students (78 percent) completed the Environmental Science Project. These students on their projects outside of the class completed over 900 cumulative hours. Parents were asked to evaluate their son/daughter's project. One parent commented that "her daughter has taken a new interest in helping out around the house because of the project. According to Knobloch, "Some of the students will say the independent project is what they enjoyed most about the class," (National FFA Organization, 1999, p. 3).

### Thinking Outside of the Box

I believe that agricultural education has one of the best-kept secrets in education — the problem-solving and practical application component of the program called SAE. Agricultural educators have the local resources to successfully conduct SAEs for students in agricultural education programs; however, we need to reorganize and promote a new way of conducting SAEs. Six components constitute thinking outside of the traditional framework of SAEs, which I have successfully experienced with students. Most of these components can be related to Martin's (1991) model, "The Experiential Learning Cycle."

### The Experiential Learning Cycle

(1) Clear Expectations - Develop specific guidelines for students and clearly communicate what they must do to complete a Supervised Agricultural Experience. Incidentally, I did not call it SAE but rather the Independent Class Project.

(2) Relevancy - Develop experiences that are related to the course content and apply skills related to the subjects covered in the agricultural classroom. Moreover, market this project to students and parents as the major homework component for the class — homework that the students can do on their time, at their pace, in topics of their interests, and they get to decide what their grade is going to be using the rubric.

(3) Structure - Structure the Supervised Agricultural Experience to be conducted and evaluated within the time frame that the students are enrolled in an agricultural course. Adapt the SAE component to fit the needs of the students. For example, if students are in the comprehensive program, then their SAEs should be continuous and comprehensive as they advance through the program. If students are enrolled in one course with no intention of further enrollment in the program, then their SAEs should be exploratory and completed within the course they are enrolled.

(4) Evaluation - Build accountability by assessing student progress by evaluating the project and performance within the course using clearly defined evaluation guides or educational rubrics.

(5) Communication - Have students develop their written and verbal communication skills by sharing their progress, results, and knowledge with their peers. Provide opportunities for peers to give feedback.

(6) Documentation - Think of creative ways to document the project, work, and progress through the use of a student portfolio which captures the student's development of knowledge and skills. The portfolio should include videotapes, pictures, multimedia presentations, research findings, journals, reports, supervisor evaluations, and/or peer evaluations.

#### Are We Ready?

We have seen many recent educational initiatives that are adopting the principles that agricultural education have practiced for over 70 years. But what about our SAE component? Are we ready to promote non-traditional SAEs? Should we consider marketing a new image of SAE, updated standards, a new record keeping and evaluation tools, and a revised recognition system?

Our profession has the solution to a more pragmatic education that will engage students to learn while experiencing the food, fiber, and environmental systems. In finding this solution called the new SAE, we need to be creative in promoting opportunities for students. Will SAE be ready for the 21st century?

Many discussions have occurred in redesigning the blueprints to promote new SAEs. Just like the plow in the grove, I believe that our profession is ready to redesign our useful and beneficial plow called SAE. Yes, I believe that these redesigned SAEs are needed to break new ground for students in the 21st century!

#### References

- American Farm Bureau. (1995). Farm facts. Park Ridge, IL: Author.
- Barrick, R. K., Arrington, L., Heffernan, T., Hughes, J. M., Moody, L., Oglie, P., and Whaley, D. (1992). Experiencing agriculture: A handbook on supervised agricultural experience. Alexandria, VA: National Council for Agricultural Education.

Keith, K. (1999). SAE: The ultimate in serving broad student populations and interests. FFA advisors making a difference. 7(9), 2.

Krueger, D. and Mundt, J. (1991). Change: Agricultural education in the 21<sup>st</sup> century. The Agricultural Education Magazine. 64(1), 7-9.

Martin, R. A. (1991). Reinventing experience programs in agriculture. The Agricultural Education Magazine. 64(6), 20 and 22.

National FFA Organization. (1999). New model SAEs. FFA advisors making a difference 7(9), 3.

National FFA Organization. (1999). Gearing up for the new millennium. FFA advisors making a difference. 7(9), 14-15.

National FFA Organization. (1998). A Guide to Local Program Success. Alexandria, VA: Author.

National Research Council Committee on Agricultural Education in Secondary Schools. (1988). Understanding agriculture: New directions for education. Washington, D.C.: National Academy Press.

Newcomb, L. H., McCracken, J. D., and Warmbrod, J. R. (1993). Methods of teaching agriculture. Danville, IL: The Interstate Printers and Publishers, Inc.

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### The Never Ending Circle of Problems and Solutions...

*continued from page 13*

John Crunkilton (1985) provided a wise and very insightful discussion of why more teachers don't use problem solving teaching. Unfortunately, many of today's teachers and teacher educators abandon ship at the first sign of danger (discomfort) and revert to a subject based teaching approach that's safe and straightforward (albeit less interesting and challenging). Ironically, not until students are pushed out of their comfort zone do they really begin to learn. The same can be said for learning to teach and learning to use problem solving as a teaching approach. In this author's opinion, the reasons usually given for not using problem solving (cumbersome, dated, ineffective, inappropriate) are primarily based upon a lack of understanding and experience with the approach. Like creating a good wine, learning to effectively use problem-solving teaching is not a simple or overnight process.

#### Summary

Is problem-solving teaching needed in agricultural education in the 21st century? Absolutely! Without question, problem solving as a thinking and decision-making process is an ability that more Americans should possess. Agricultural education serves only a small percentage of the youth and adult population as a whole but has a significant impact on the professional development of those working throughout the agricultural industry. Many of the world's future problems will be placed into the hands of agriculturists with the expectation (and hope) that they will provide workable and sustainable solutions. The use of problem solving teaching in agricultural education has the

potential to significantly contribute to the ability of future agriculturists to meet the complex challenges that lie ahead.

#### References

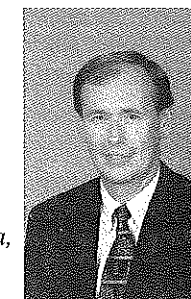
Crunkilton, J.R. (1985). Six steps for using problem solving. The Agricultural Education Magazine. 58(5), 10-11.

Dyer, J.E. (1995). Effects of teaching approach and achievement, retention, and problem solving ability of Illinois agricultural education students with varying learning styles. Unpublished doctoral dissertation, University of Illinois, Urbana-Champaign.

Flowers, J. (1986). Effects of the problem solving approach of achievement, retention, and attitudes of vocational agriculture students in Illinois. Unpublished doctoral dissertation, University of Illinois, Urbana-Champaign.

Guralnik, D.B. (ed.) (1982). Webster's New World Dictionary. New York: Simon and Schuster.


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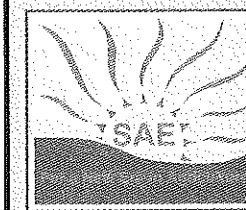
### Go To The Head of The Class...

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Answers:

- 
- 12. D
  - 11. B
  - 10. C, 1988
  - 9. C, 1971
  - 8. D
  - 7. B
  - 6. A
  - 5. C
  - 4. A
  - 3. C, 1944
  - 2. B, 1939
  - 1. C

## SAE Central



<http://www.cals.ncsu.edu/agexed/sae/toolbox>

# School to Careers: How Agricultural Education Can Contribute

By Vernon D. Luft

Developing a School to Career transition system is a major initiative in school reform efforts in many states today. When most agricultural educators think of School to Careers, we think, "So what's new and different about that? We've been providing work-based learning since the beginning of our program in agricultural education!"

Experiential learning, which provides students with practical knowledge and skills relevant to their career goals, has always been an integral part of agricultural education programs. Years ago, students in vocational agriculture had supervised farming programs, which later became known as supervised occupational experience programs, and today referred to as supervised agricultural experience (SAE) programs. Early programs required students to have productive enterprises on their farm or ranch. They also had improvement projects to compliment their enterprise programs. As we gained students in the program who were not farm youth, or who had goals leading to careers of off-farm or non-production agriculture, the experience programs broadened to include placement programs, entrepreneurship programs, and experiences in school laboratories. Today's agricultural education programs have broadened even more. We now have aquaculture, international agriculture, biotechnology, and other agrisciences. As our programs expand, the task of providing or arranging for experience programs, and particularly work-based learning experiences, for these students becomes most challenging. Agricultural

education teachers have to be more creative in helping develop SAE programs.

What does this have to do with School to Careers? I believe our agricultural education experiences can provide others with assistance in making the School to Careers movement a success. We can also use the School to Careers system to strengthen work-based experiences programs in agricultural education. The remainder of this article will provide some suggestions for accomplishing this.

## Experiences for Students

The 1988 report, *Understanding Agriculture: New Directions for Education*, recommended that we provide education about agriculture and education in agriculture. Education about agriculture is often comprised of "Agriculture in the Classroom" for elementary students, middle school level agriculture, and general agricultural classes that are not directed at preparing enrollees for specific careers in the agricultural industry. These programs can provide students with work-based learning experiences of an exploratory nature.

Elementary teachers who are prepared through "Agriculture in the Classroom" to integrate agricultural concepts in their math, science, language arts, and social studies courses can help students understand the applications if they saw them in real life situations. Agricultural education

teachers can help elementary teachers arrange for field trips to agricultural industries and farms in their community. In addition to field trips, students could be provided opportunities to visit agricultural businesses during their career exploration and/or job shadowing days.

Agricultural education teachers spend a great deal of time and effort to recruit students to maintain program enrollments. Instruction at the middle school/junior high level is often found to be an excellent avenue to recruit next year's class(es) of agricultural education students. Providing experiences in the workplace for middle level students may help spark an interest in agricultural careers. A common activity of School to Careers at this level is to



Teaching with Problem-Solving activities should begin in the early grades. (photo by G. Wardlow, University of Arkansas)

provide career exploration and job shadowing days. If this occurs in our communities, agricultural education teachers should help make sure agricultural businesses are among those opportunities from which students can select. For students enrolled in a middle level agricultural program, these experiences should be a part of the agricultural course.

As our secondary agricultural education programs have broadened in scope, so have the diversity of students enrolled. There is a much broader array of interest in agricultural subjects of our students enrolled today than in years past. How do we provide work-based learning experiences for students enrolled in an aquaculture class in the high desert of Nevada or the high planes of North Dakota or Montana, or how do we provide experiences in biotechnology in many isolated small rural communities in which so many of our secondary agricultural programs are located. We have to be creative! Perhaps it means transporting students to a site where they can spend a day or two shadowing a worker in a business of their area of interest. Perhaps we should look at opportunities to arrange for exchanges with agricultural education students in locations where these opportunities exist. Students who have work-based learning opportunities in their community could host a student from locations lacking such experiences. These exchanges may become easier to arrange with the use of the World Wide Web. How about using the FFA web site's talk exchange? There seems to be potential for some interesting opportunities if we want to explore them.

## Opportunities for Teachers

Over the last two summers, I conducted an educator externship program in collaboration with northern Nevada's School to Careers



Agriculture teachers and science teachers attend inservice education for new ideas to teach Problem-Solving and Experiential Learning. (Photo courtesy of G. Wardlow, University of Arkansas)

partnerships. Over 70 educators have participated in the program. The program was based on the feeling that if teachers and counselors are to encourage or require their students to participate in School to Careers work-based learning activities, they should have recent experience in business and industry themselves. An externship would help teachers make their instruction more relevant in preparing students for the world of work, and it would help counselors to provide students with more accurate career information. For example, a math teacher participating in the externship program worked for a concrete construction business. As he worked along side the construction firm's employees, they asked him questions about calculating areas, volume, etc. The math teacher decided to take a pocket note pad to work with him and write their questions down, and later use them in his math classes.

Participants in the program, who were able to earn three university credits by enrolling in a course entitled Occupational Development in Business and Industry, were required to work a minimum of ninety hours in a business that could benefit them or

was related to their educational assignment. They could not work in a business in which they had previously worked, or jobs they had held routinely in past summers. Educators in rural areas of the state were able to work and meet the course requirements in their own communities. Participants submitted progress reports during their experience and a final report at the end. They reported through fax or mail. The number of required hours allowed participants to complete their work and still have sufficient time for summer vacations and other activities. Participants were paid a stipend through their local School to Career partnership, or a wage from their employer. Participants have included elementary teachers, special education teachers, counselors, a school nurse, a secondary school principal, and teachers of almost every subject taught at the secondary level.

The value of the educator extern program has been powerful. Academic teachers have become familiar with the need to integrate practical workplace examples in their instruction. They have learned what

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# Using Problem-Solving Approaches in Teaching Agricultural Education for the 21<sup>st</sup> Century

By Roland L. Peterson and Richard M. Joerger

Should we use problem-solving approaches for teaching in, and about, the food fiber, and natural resources industries in the 21<sup>st</sup> century? The question triggers an immediate response in our thinking—the same reaction as one can read in II Corinthians 1:17-20, particularly verse 20, when the people said, “Yes!” Why did they say “Yes!”? In the scripture passage, the evidence convinced Paul! In many circumstances, when we are convinced, we say “Amen” or “So be it!” Today, discussions about the existence of Agricultural Education in the 21<sup>st</sup> century have all seemed to conclude with a resounding “Yes!” The contextual learning feature that Agricultural Education brings to the school setting gives reason enough for its central role in the curriculum. However, in addition, the career education component also provides a reality dimension that makes agricultural education meaningful.

## What is Problem Solving?

What are the features of the problem-solving approach to instruction? Evidence of the importance and use of the problem-solving approach in agricultural education has existed since the early 1900s. Lancelot (1929), addressed the idea of transitioning from memorization to thinking and provided a description of problem solving. He stated that there is but one way to lead students to think and that is to give them something to think about. He further shared that merely to tell them to think about a topic is futile, but to give them a problem that lies within their power to solve is a regular and natural thing. He summarized his thoughts by stating that all teaching should be by

means of problems. Though we acknowledge there are numerous approaches to teaching, we believe the regular use of the problem-solving approach provides students with a variety of solutions for solving issues in all aspects of their lives.

What is a problem? Though many authors define problems somewhat differently, a problem exists when there is a distinct difference between what is being experienced, felt, or understood and what should be understood, experienced, or felt. Due to the complex nature of the food, fiber, and natural resource systems, students enrolled in agricultural education courses are surrounded by a host of problems.

The problem-solving approach to instruction is unique in that it teaches students to become problem seekers before becoming problem solvers. Students of any age feel a real sense of accomplishment when they “solve” a real and meaningful problem.

Problem solving is a process. Newcomb, McCracken, and Warmbrod (1993) shared Dewey’s perspective of problem solving, which involved the following learning process:

- ◆ Experiencing a provocative situation
- ◆ Defining the problem
- ◆ Seeking data and information
- ◆ Formulating possible solutions
- ◆ Testing the solutions
- ◆ Evaluating the results

Beyer (1987) outlined the following thinking strategy involved in problem solving:

- ◆ Recognizing a problem (identifying a problem, becoming aware of a problem)
- ◆ Representing the problem (defining the problem clearly enough to deal with it)
- ◆ Selecting a plan for solving it (selecting a desired goal or an objective, developing a hypothesis)
- ◆ Executing the plan (employing a strategy, solution strategy)
- ◆ Evaluating the solution (summarizing and concluding, making some decisions from alternatives)
- ◆ Implementing the decision (making recommendations)

It is evident that many would categorize problem solving as a thinking process. It is also evident that decision making, critical thinking, and creative thinking are other phases of thinking strategies (Beyer, 1987). We believe the simple concept as outlined in Beyer’s strategy describes the basic framework involved in the problem-solving process. It is our contention that there have been enormous variations in what is considered problem-solving approaches to teaching. We have observed numerous class situations and rarely if ever have we seen a group of students trying to solve a real student-suggested problem. It is clear that Agricultural Education leaders in the 1910s, ‘20s, ‘30s, ‘40s, and ‘50s had a strong view of problem solving. However, we are not so sure if they had total agreement. We have espoused problem solving in Agricultural Education for decades. What did we mean? One key issue that emerges from the literature is that problems were real and the basis for



Problem-Solving instruction can lead toward project intergration. (Photo courtesy of G. Wardlow, University of Arkansas)

teaching agricultural education. It would seem the source of problems is crucial to problem solving. In an earlier time, problems primarily emerged from the supervised agricultural experience component. They were not only real, they were of sufficient scope to engage a class in a full discussion, and cause them to propose solutions and formulate decisions. Consequently, Rhoad (1951) provided techniques or variations for solving problems once they were defined.

Rhoad listed 20 steps in teaching four variations of the problem method. It appears that the techniques Rhoad suggested provide a sound process for solving problems. Problems need to come from life experiences and real subject-matter-based provocative situations. Rhoad clearly outlined that if the problem involved procedural learning, the steps and key points technique provided a logical way to think and solve the problem. If the problem involved forked-road learning or making a choice between two alternatives, the advantages vs. disadvantage technique would lead a class to a logical problem solution. If the problem involved selecting from several choices, the possibilities and factor technique for making a decision would be a means of arriving at a

solution. If a problem involved improving a program, a plan, or a facility, the present situation compared to accept standards technique would lead students to a logical solution. If a problem involved determining a cause and effect solution, it appears that a well-designed experiment or laboratory activity would lead students to an appropriate and logical solution. If a problem involved understanding a basic set of facts, the logical solution would be to follow a question and answer technique. Consequently, subject matter content is the key that determines the best technique or techniques to use in solving the problem.

## Why May the Problem-Solving Approach to Teaching be a Disappearing Process?

In our view, the greatest challenge to effectively using the problem-solving approach to teaching for the 21<sup>st</sup> century is that it requires having real problems. We live in an era that often uses simulation and provides pre-made decisions. Who wants to think? Who wants to discuss? Who wants to seek information and make a decision when the computer seems to perform all the processes in a matter of seconds? We are rapidly becoming

accustomed to a system of artificial, simulated situations. Consequently, when faced with real problems, how do we go about thinking through to an appropriate solution? Today, the evidence is clear that students spend less time watching their parents make decisions. One may ask, why bother about solving problems? Why bother about making such a big deal about problem solving? Consequently, one is led to ask, is the problem-solving approach to instruction outmoded?

Agricultural, food, and environmental issues provide a wonderful context for identifying and solving meaningful and relevant problems. What will be the source of real problems? Today, few students have any type of supervised agricultural experience programs. Are we willing to take time to identify problems, define problems, and work through a solution using one of the previously mentioned techniques? And finally, are we disciplined enough to develop our skills for regularly using the problem-solving approaches to instruction? This approach to teaching is critically important when children seldom become involved in parental decision-making. We question whether we really want to bother about solving real problems in the 21<sup>st</sup> century. We may find it easier to resort to lectures and work sheets. We question whether many techniques we use really engage students in the problem-solving process.

## In Summary

Is it appropriate in the 21<sup>st</sup> century to use problem-solving approaches to instruction in teaching students how to effectively solve real and meaningful problems? The answer should be a resounding “Yes.” However, without real problems, without a willingness to engage

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## Missouri

I think Supervised Agricultural Experience (SAE) is definitely needed in the 21<sup>st</sup> century. There are many benefits to having an SAE. When you are involved in a Supervised Agricultural Experience you keep a record book, which teaches you responsibility and the importance of records. By having an SAE you have the opportunity to get experience that will help you later in life. No matter what century we are in, responsibility and experience for the future can be provided by a Supervised Agricultural Experience.

Debbie Wassmann  
Boonville FFA President

### SAE is Problem Solving...

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to come back to when they run into problems themselves. One example of how Keaton does this is with the use of a spreadsheet on marketing. On this sheet there is a place for all input cost of raising the animal (purchase cost, vet cost/head, feed cost/head, death loss, etc.) and then compares that to the selling cost. Students then can change their feeding program, or the place they market their animal (county fair vs. sale barn) This gives the student the hands-on ability to see how small changes can add up to larger profits.

The question is "Is problem-solving teaching and SAE needed in Agricultural Education in the 21<sup>st</sup> century?" The above examples demonstrate that SAE is full of problem-solving situations. Agricultural education teaches students to think and to reason their way through practical problems, whether it is in agribusiness or in production agriculture. This is a life skill that will help students throughout their career and

life. The question then becomes "Can Agricultural Education lead the way into the 21<sup>st</sup> century without problem-solving and without utilization of a SAE program?" In our opinion, SAE is problem solving!

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students in identifying real problems, and without a set of techniques to provide a thinking framework to solve the problem, it is our contention we will continue to talk about problem solving but our teaching will continue to be a pursuit of acquiring facts and information. We need to be clear about what problem solving means. We also need to be committed using various problem-solving techniques which guide students in the thinking processes. Should Agricultural Education use the problem-solving approaches to instruction? It may be something we talk about; however, has it been the core of our approach to teaching? It should be! We have a broad and important context that touches everyone's life. The 21<sup>st</sup> century can be a time to renew our enthusiasm for problem-solving approaches.

### References

Newcomb, L., McCracken, J. D. and Warmbrod, J. R. (1993). Methods of teaching agriculture. 2<sup>nd</sup> Edition. Interstate Publishers, Danville IL.

Beyer, B. (1987). Practical strategies for the teaching of thinking. Allyn and Bacon, Boston.

Rhoad, C. E. (1950). The problem method of teaching. Number 178. The University of Nebraska, College of Agriculture.

Lancelot, W. H. (1929). Handbook of teaching skills. John Wiley and Sons, New York.

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### School to Careers: How Agricultural Education Can Contribute...

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employment skills are expected, how their subject area is applied in the real world, what career opportunities there are in the various industries, and the importance of occupational education. Occupational teachers generally worked in sites that enabled them to gain new skills, broaden their subject matter knowledge, and develop an awareness of career opportunities for students in their respective occupation. One industrial education teacher who was required to go through the complete job application and interview process in his firm reported that he hadn't applied for a job in twenty years. The experience gave him first hand knowledge as to what he needed to teach students about applying for jobs in today's market.

Imagine how we could strengthen the image of agriculture if university agricultural education departments offered a similar program whereby teachers are placed in businesses that can help them broaden their scope of instructional skills related to the classes they teach. Providing experiences in the agricultural industry for teachers of other subjects can help them understand and appreciate agriculture, become aware of the career opportunities, learn agricultural skills, and learn the applications of their discipline in agriculture. Elementary teachers who do "Agriculture in the Classroom" can gain further familiarity with our discipline, learn workplace skills to teach their students, and learn of the vast array of career opportunities available.

Academic teachers also learn the importance of occupational education during their externship experiences. A middle school English teacher reported at the end of her experience that she hadn't given much thought

before about integrating workplace skills into her classes until doing her experience in a heavy equipment business. There, she learned about the many jobs that required occupational preparation and the communications skills that were used in such a business. She was sold on the need for academic and occupational teachers to work together to assure that we are adequately preparing students for their futures.

An externship program for agricultural education teachers has many benefits as well. Several states require occupational teachers to have a designated number of hours of work experience in an industry of the subject area in which they will be teaching in order to acquire their initial license. However, to renew one's teaching license, the accumulation of a designated number of credits is usually what is required. Additional experience in the industry is not usually required.

Agricultural education teachers do supervise students' agricultural experience programs, which gets them into the business world. Is that enough to stay current in their subject matter? An externship experience enables teachers to gain new skills or to hone those skills in which one is not very competent. Perhaps an agricultural education teacher wishes to incorporate new instructional units into his/her program—units which he/she is not too familiar with and feels uncomfortable teaching. An experience in a related agricultural business can help develop necessary skills for teaching the class.

### Conclusion

Work-based learning experiences are important for teachers as well as students enrolled in agricultural education. Educators have been able to form strong partnerships with

businesses as a result of their externship experience. They have been able to use real life examples from the world of business and industry in their teaching. These and other benefits have contributed to better instruction among those who took the time to participate in a workplace experience. I strongly encourage agricultural educators to examine various avenues to provide work-based learning experiences for their students, and for teachers to participate in an agricultural business externship when possible.

Agricultural educators have a rich history of providing experience programs for their students. We can use this experience to help others and contribute to the success of School to Careers.

### Reference

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

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## Calling All Authors

The theme for March-April 2000 is on "Securing an Adequate Supply of Teachers." If you have thoughts on this topic please formulate them into an article and send it to:

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We need the manuscript by February 15. An ideal length is 3 double spaced pages.

Thanks!



## Milestones in the FFA

by Gary E. Moore

As we approach the end of the 20th century there has been some effort to identify the significant events and people of the century. We don't want the FFA to be left out. This quiz focuses on important dates and events in the history of the FFA. While many of the questions are simple, some may cause a little thinking. Go to the Head of the Class if you can answer all 12 questions.

1. The first national FFA convention was held in Kansas City, Missouri in the Baltimore Hotel. In what year did this meeting occur?
  - A. 1900
  - B. 1917
  - C. 1928
  - D. 1929
2. The FFA purchased land that was part of George Washington's estate for a national camp in what decade?
  - A. 1920s
  - B. 1930s
  - C. 1940s
  - D. 1950s
3. The National FFA Foundation was established to raise money for the FFA in what decade?
  - A. 1920s
  - B. 1930s
  - C. 1940s
  - D. 1950s
4. The FFA received a federal charter from the U. S. Congress in what year?
  - A. 1950
  - B. 1951
  - C. 1952
  - D. 1953
5. The National Future Farmer Magazine started in:
  - A. 1950
  - B. 1951
  - C. 1952
  - D. 1953
6. To commemorate the 25th anniversary of the FFA in 1953:
  - A. The U.S. Post Office issued a FFA stamp.
  - B. The Sons of the Pioneers appeared at the national convention and sang "Forward FFA."
  - C. Normal Rockwell produced a special FFA painting that served as the cover of the Saturday Evening Post in October.
  - D. Chevrolet produced a National Blue and Corn Gold pickup truck.
7. What significant event occurred in the history of the FFA in 1965?
  - A. The Star Agribusinessman of America was first recognized.
  - B. The New Farmers of America merged with the FFA.
  - C. The Building our American Communities program was launched.
  - D. Girls were admitted to membership in the FFA.
8. What significant event occurred in the history of the FFA in 1969?
  - A. The Star Agribusinessman of America was first recognized.
  - B. The New Farmers of America merged with the FFA.
  - C. The Building our American Communities program was launched.
  - D. Girls were admitted to membership in the FFA.
9. The FFA alumni organization was started during what decade?
  - A. 1950s
  - B. 1960s
  - C. 1970s
  - D. 1980s
10. The name Future Farmers of America was changed to the National FFA organization in what decade?
  - A. 1960s
  - B. 1970s
  - C. 1980s
  - D. 1990s
11. The national headquarters of the FFA moved from Alexandria, Virginia in 1998. Where is the new headquarters located?
  - A. Kansas City, Missouri
  - B. Indianapolis, Indiana
  - C. Madison, Wisconsin
  - D. Louisville, Kentucky
12. After 70+ years in Kansas City, the national FFA convention moved to a new location in 1999. The 1999 convention was held in:
  - A. St. Louis, Missouri
  - B. Indianapolis, Indiana
  - C. Alexandria, Virginia
  - D. Louisville, Kentucky

### ...Just Let Them Go To The Shop (continued from back cover)

welding book and check up on it. It's one or the other. Not enough heat, looks like.

"Joe looked up. The high speed grinder was rumbling ominously. Adolph was making the sparks fly from an old file.

"What's the matter here, Adolph?"

"I don't know, Mr. Scatterscrew. I just put on a new stone. Maybe the taps aren't tight."

"That's your trouble. Always tighten a new stone good. Say! Are you sure this is a high speed stone? Looks like a low speed."

"Don't matter, does it?"

"Well, don't put too much pressure on it. This thing gins at over 3000 RPM's."

"Okay, Mr. Scatterscrew. What makes this knife turn blue on the edge?" "Carbon in the steel. Or, maybe it gets too hot. Watch it." Joe wandered over and watched Dill Pickle Beamer and the boys drilling holes in the frame of the hot rod.

"Watch that drill, boys! Stay out of that puddle of water that dripped from the radiator. That old extension cord is kinda frayed."

"Mr. Scatterscrew, you shoulda seen old Dill Pickle drop that drill while ago when he got a little jolt."

"Water and electricity don't mix, boys. Keep that cord dry." Joe teased Mike about his squirt gun until Mike broke a small drill in putting a hole through the pipe cap.

"How many times have I got to tell you boys to squirt oil or water on these little bitty drills. And change the belt to low speed!"

After the boys changed the belt, he strolled over to the self-feeder project.

"Somebody's got some of my lumber," Sara moaned. "I left it right against the wall last fall. I know it was there, then."

Joe helped her look for the missing lumber, but they couldn't find it. "Well," Joe finally remarked. "These things happen. Go out to the bus shed and find something."

"Couldn't I make frames for the left doors and cover them with some of that sheet iron?"

"And get the pigs' noses cut up? No! I tell you what. Get some of Carl Spacek's lumber over there. Don't look as if he will ever get around to finishing that row boat he started. If he ever gets around to it, I'll get him some more."

Joe strolled around and watched the boys. Wilma was culling down a piece of locust post on the lathe. Joe corrected the way she held the chisel. A man had to stay on the ball in a shop. An accident could happen any time.

A resounding oath echoed from under Dill Pickle's car. "Watch that cussing, boys!"

"Drill stung me again, Mr. Scatterscrew!"

Joe picked up the board. "More than that's going to sting you if I hear any more of that kind of talk!"

"Yessir."

"Joe put a stop to some of the kids batting a wood chip around and made them carry out some more scrap iron before he got back to Leon and his welding. "Doing any good, Leon?"

"No sir! I ran that heat up and pretty near melted my frame!" "Too much heat, then. That's a fact.

"Leon looked discouragedly at the ragged hole in the light metal and spit on a blister on his thumb.

"Tell you what, Leon. Just bore some holes on either side of that crack and bolt you a good heavy piece of that old wagon tire on her.

That should do it."

"Don't know if my cover would fit then."

"Oh, yeah. We'll just spring her out a little." Leon nodded dubiously as the bell rang. Some of the kids ran out of the door but Dill Pickle, Mike, Adolph, and Wilma kept working.

"Knock it off now. Put those tools up and get to class," Joe ordered.

"Oh, Mr. Scatterscrew, we just got that old study hall! Can't we stay and finish up first?"

Joe hesitated. He knew Wilma and Adolph were failing English and Dill Pickle was behind on a History assignment, but they had worked well—shown a lot of interest.

"Well, you can stay for about half the period and then you better clean up and shove off to that study hall.

"Wilma winked at Adolph. "You sure are a good guy, Mr. Scatterscrew.

"Joe went back in the classroom and picked up the teaching plan for V.A. III, Marketing the Summer Egg Production. Gather three times a day. Keep eggs cool. Anybody knows that. Besides, it's just the last of April. Might hold some classes on marketing eggs just before school is out.

He leaned back in the chair. That was a darned good shop class. Woodwork, welding, auto mechanics, shop safety, pipe fitting, and shop cleanliness all rolled into one.

"By gosh, there's nothin' like a good shop day," he told himself with emphasis. "I'll just let the V.A. III class go to shop!

"He adjusted the fan and waited for the second bell.

*E. V. Walton is deceased. He was an agricultural educator at Texas A&M University during the 1950's where these stories were written.*



## ...Just Let Them Go To The Shop

By E. V. Walton

**F**lies buzzed around in the room and the gnats kept getting worse every day. It was hot, too. The temperature was in the high eighties and it was still April. Another month of school to go, Joe Scatterscrew thought glumly as he looked at the clock. It would soon be time for the V.A. II class to come in. It's just too hot to study. Can't keep the students interested in anything.

Joe yawned and began to look for his teaching plan. He found it in between the dictionary and Feeds and Feeding in the bookcase. Controlling insects and diseases of corn ten periods. He yawned again. A man just couldn't keep up with all the control measures. Sulphur, D.D.T., Arsenic, Lime, and other chemicals. He found a bulletin and studied it briefly. Too many bugs. Too many diseases. Too many cures.

He got up and erased the board and tried to think of some way to get the kids interested in corn insects. He vaguely remembered that insects and diseases got so many bushels out of ten. Or was it eight. He thought about it for awhile and tried to remember where he had read the figures.

Well, farmers in this community know about all of that, he concluded. I know what I'll do! By golly! It's about time the students had another shop lesson. Exercise will do them good. They go to sleep at this time of the year without exercise.

The kids came in with their usual pushing and shoving. Joe Scatterscrew rapped two or three times with his ruler and started to call the roll.

"Let's have a field trip, Mr. Scatterscrew!" Wilma Skrabanek shouted. "Shut up Wilma. Sit down Adolph. Jack! Leave that fan where

it is! Now you listen to the roll!"

He filled out the absence slips and cleared his throat. "Mr. Scatterscrew, sure enough, seriously now! Adolph's daddy has a sick cow. Let's go see can we find out what's the matter with her," Wilma pleaded.

Joe hesitated. He had always liked Mr. Kramer and if he had a sick cow, perhaps they should go out.

"I know what's the matter with her," 'PeeWee' Page said. "What?" "Missmeal colic!"

Joe Scatterscrew nearly lost his temper trying to get them quiet again, but in the interim he made his decision. "We're going to work in the shop today," he announced firmly.

The boys greeted this jubilantly and half of them dashed to the shop entrance.

"Come back here! Every one of you. You aren't going anywhere yet. Now what are you going to do?"

"Could I work on my hot rod, Mr. Scatterscrew?" 'Dill Pickle' Beamer asked.

"Okay. That's a project. What do you want to do?" "Put on a header and twin tails."

"Okay. Now, what about you, Wilma?"

Wilma thought hard. "Could I run the wood lathe?" "I reckon. Now, Adolph?"

"I want to make me a bowie knife out of a file. I saw one John made last year."

"Go ahead. Sara?"

"I would sorta like to finish my hog feeder I started last fall. I need it bad with my shoats."

"Okay. You four kids help Sara. What about you, Leon?" "I want to weld my motor scooter frame."

"Fine. Mike?"

"I seen a water gun made out of a half inch pipe, some washers,

leather, and a welding rod. Shoots two hundred feet. Could I make one?"

"Now, what kind of a project do you call that?" Joe asked disgustedly. "No!"

"But, Mr. Scatterscrew! I could use it on dogs. Every morning that old dog of Bailey's nearly tears me up when I'm delivering papers. It's a useful project. How would you like to nearly get a leg tore off from dogs everyday? Could I make me one?"

"Oh, all right. But from now on you have something better in mind. Like a chicken feeder or something."

"Could we help Mike?" three boys called in unison. "No. All you that don't have anything to do, clean up the shop. Sharpen those chisels. Sweep up. Carry that junk off to the bus house and clean up those greasy wrenches."

The kids groaned without real mental anguish and trooped to the shop.

Joe leaned against the door jamb and contentedly watched the beginning activity. "Nothing like a good shop to keep them on their toes," he mused before Leon called him.

"Mr. Scatterscrew, what's wrong? I can't get this scooter frame to weld right."

Joe peered at the work and then put on a helmet. "Try it again." Leon tried to strike an arc. The rod sputtered erratically and stuck.

"See there, Mr. Scatterscrew? It does it every time." "Well, I'll tell you, Leon. These things happen. Either you got too much heat or not enough. Or maybe you got the wrong sized rod.

"He looked at the crack in the frame and packed it with a chipping hammer.

"Maybe you better get that