Do you see the young woman or the old woman?
Can you see both?
Can you see alternative ways to strengthen programs?
Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Editor/Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDITOR'S COMMENTS</td>
<td>Setting Targets for Program Improvement</td>
<td>Ed Osborne</td>
</tr>
<tr>
<td>THEME EDITOR'S COMMENTS</td>
<td>Strengthening Programs - A Priority for All!</td>
<td>Earl B. Russell</td>
</tr>
<tr>
<td>THEME ARTICLES</td>
<td>Small Schools Benefit From Collaborative Relationships</td>
<td>Meece Baker</td>
</tr>
<tr>
<td></td>
<td>A F. R. E. I. Guide to Strengthening Programs</td>
<td>Wende Hunter</td>
</tr>
<tr>
<td></td>
<td>Bleeding Outcomes Based Education and Tech Prep</td>
<td>David Walsey, Dan L. Lacero, &amp; Glen Risk</td>
</tr>
<tr>
<td></td>
<td>A Statewide Alliance for Improving Adult Education</td>
<td>Richard Treat &amp; Randi Wall</td>
</tr>
<tr>
<td></td>
<td>Futures Studies as Curriculum Building</td>
<td>Maynard J. Iverson</td>
</tr>
<tr>
<td></td>
<td>Block's for the 21st Century</td>
<td>Gary Moore &amp; Jim Flowers</td>
</tr>
<tr>
<td></td>
<td>Strengthening Programs Through an Expanded Model for SAE</td>
<td>N. L. McCaslin &amp; Robert M. Torres</td>
</tr>
<tr>
<td>FEATURE COLUMN</td>
<td>Teaching Agricience</td>
<td>Sheila Barrett &amp; Phil Brown</td>
</tr>
</tbody>
</table>

Form 1. Agriculture Program Evaluation

<table>
<thead>
<tr>
<th>Quality Indicator</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Effectiveness as a classroom teacher</td>
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</tr>
<tr>
<td>2. Effectiveness as a lab teacher</td>
<td>P F F G E</td>
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<tr>
<td>3. Skills developed by students</td>
<td>P F F G E</td>
</tr>
<tr>
<td>4. Knowledge gained by students</td>
<td>P F F G E</td>
</tr>
<tr>
<td>5. Student attitudes toward learning</td>
<td>P F F G E</td>
</tr>
<tr>
<td>6. Balance of classroom and lab instruction</td>
<td>P F F G E</td>
</tr>
<tr>
<td>7. Effective use of computers in teaching</td>
<td>P F F G E</td>
</tr>
<tr>
<td>8. Effective use of computers in managing instruction</td>
<td>P F F G E</td>
</tr>
<tr>
<td>9. Scope and quality of adult instruction</td>
<td>P F F G E</td>
</tr>
<tr>
<td>10. Number, quality, and variety of instructional materials</td>
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<tr>
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<tr>
<td>12. Ag literacy courses or lessons taught</td>
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<tr>
<td>13. Up-to-date written courses of study</td>
<td>P F F G E</td>
</tr>
<tr>
<td>14. Written professional improvement plan that is updated annually</td>
<td>P F F G E</td>
</tr>
</tbody>
</table>
Strengthening Programs -- A Priority For All?

Every agricultural educator wants to be part of a solid, strong, and respected educational program. We intuitively know that constant improvement is key to being associated with such a program. While we may keep the concept of an "ideal" program in our heads, we also know that we will never arrive at such an ideal. Continuous improvement is a journey, not a destination.

Such a view is compellingly presented by Stephen Covey in his best-selling 1989 book, The 7 Habits of Highly Effective People. He elaborates viewpoints aimed at strengthening individuals and how they can subsequently strengthen work settings, institutions, and organizations. Agricultural educators can gain much from a careful study of this book.

Examples of Covey's ideas have particular relevance to strengthening agricultural education programs include the distinction between one's "Circle of Concern" and "Circle of Influence." The former deals with all the things we might worry about, but which may be beyond our ability to control; while the latter focuses on the areas under our control. The more proactive we become, the more initiative we take to bring about positive changes within our "Circle of Influence," and the greater our capacity becomes to bring about improvements.

A related concept is the distinction between "Production" and "Production Capability." We can spend our entire energies producing more, working harder than ever, and so deplete our physical and mental resources that our capacity to produce comes to a screeching halt. Focusing on constant, balanced improvement in both our outputs and our talents can create the desired and necessary balance between "Production" and "Production Capability." This is a fundamentally important concept for agricultural educators who are committed to strengthening their programs, because a healthy balance is key.

Authors of articles in this issue on the theme, "Strengthening Programs," are to be commended first for their initiative in taking decisive steps to bring about improvements in programs in which they are engaged, and second, for going to the effort to document their efforts for the benefit of members of the profession. By these means they have expanded their "Circle of Influence," among the rest of us, have enhanced their own "Production Capability," and have provided mechanisms for us to expand our "Production Capability" as well.

The Substance of Improvement

Countless examples of program-strengthening activities could have been reported in this issue. In fact, substantially more articles were submitted for consideration than space could accommodate in a single issue. Those selected here are excellent examples of different perspectives and approaches which can be taken to making agricultural education programs better.

The Hunter article is impressive in its account of how a dormant program in a small school experienced a rebirth. The collaborative activities reported here typify how many other programs might go about improvements in the future.

An urban emphasis on food science by Hunt is also presented as an example of a Tech Prep program. Much can be learned from this article. Students in agricultural education are more likely to have experience with food and food products than in any other aspect of agriculture, whether the school is in urban, suburban, or rural areas. Are we capitalizing on this experience factor as well as we should?

Moore and Floures suggest curricular improvement through an expanded model of supervised agricultural experience, and McConnell and Torres present a thoughtful rationale for using evaluation to strengthen programs of agricultural education.

Reading and acting on these and other articles in this issue can provide a sound footing for strengthening programs. We can be enabled to expand our "Circle of Influence" and our "Production Capability." Let's understand and act on new perspectives.

By Earl B. Russell

Dr. Russell is associate professor of agricultural education at the University of Illinois, Urbana-Champaign.

About the Cover

A perceptual illustration adapted by the Theme Editor from The 7 Habits of Highly Effective People by Stephen R. Covey (1989, New York: Simon & Schuster). Covey contends that we often view future possibilities from existing programs in our heads, and that the "maps" often fail to accurately reflect the territory ahead. He guides the reader through processes of constructing new and appropriate "maps."

Coming in August...

Teacher-authored articles on the theme

What Teaching is Really Like!
Small Schools Benefit from Collaborative Relationships

With 240 students in grades nine through twelve, Greenwood ranks as one of the smallest public high schools in Pennsylvania. Greenwood doesn't field a football team. The agriculture program there has no laboratory facility. Only three administrators oversee the total district operation. How can such a small school support a successful agriculture program? The answer: collaborative relationships.

Greenwood's collaboration begins in the agriculture department itself. The staff consists of Wayne Zeigler, part-time aide, and myself. Zeigler is a local grain farmer and reputable computer whiz. We complement each other in both our interests and abilities. Frankly, Zeigler brought me kicking and screaming into the computer age. He also offers a solid production background and serves as an excellent resource for that part of the curriculum. On the other hand, I bring a biological science and economic slant to our classes. We often share Zeigler's computer talents with others in the school system. Even the administrators have taken advantage of his computer lessons.

Collaborative relationships among the administration, faculty, community, and agricultural agencies provided the necessary foundation to reopen Greenwood's agriculture department after nearly 20 years. Even more important, the relationships continue to ensure the viability of that same program today.

Strong advocates of agricultural education are Principal Ed Burns and guidance counselor Terry Cameron. Both have been instrumental in developing a course selection system that allows for flexible scheduling. Students who pick agriculture as their major track are asked to select a minor: academic, business, or industrial arts. They benefit from the agriculture curriculum, and at the same time take advantage of all the academic, business, or industrial arts courses offered. A direct result of this has been the increased enrollment of agriculture students in postsecondary education (50% of the agriculture majors graduating in 1991).

Principal Burns, who has helped judge the State FFA Interview Contest and sometimes chauffeurs the students during the State FFA Activities Week, believes any stigma attached with being an agriculture major is gone. "The student body no longer looks down on the agriculture program," he says, "and I believe this is due to three factors: the willingness of the faculty to be flexible and cooperative in their programming, the leadership development that is a valuable part of the agriculture curriculum, and the involvement of agriculture students in the school as a whole."

Faculty collaboration is essential in making a small agriculture program work. Although Greenwood has no agricultural mechanics laboratory, the industrial arts department welcomes agriculture students into its electrical, metal, and wood laboratories.

In addition, collaboration also exists between the agriculture and science departments. Jack Richard, life science and physics teacher, and the agriculture instructor team teach a unit in environmental issues each spring. Topics include land judging, wildlife, forestry, aquatics, and current issues. The culminating activity of this unit is student participation in a community-wide "envirothon." Laboratory facilities, equipment, and expertise are readily shared between the agriculture and science disciplines.

The community helps out, too. The members of the Greenwood School District's agriculture advisory board are diverse. The board meets to discuss curriculum updates and plan the adult education program to be offered by the agriculture department in the upcoming year.

Community people often act as resource person in both the secondary and adult education classes. The local veterinary clinic, (continued on page 9)

A F. R. E. E. Guide to Strengthening Programs

F. R. E. E. is the acronym chosen for our new Tech Prep program at the Chicago High School for Agricultural Sciences. F. R. E. E., which stands for Food Science for Research, Education, and Employment, is the perfect name for a program that "taps" students who feel "trapped" by the strictures of traditional educational strategies.

Tech Prep is an educational initiative that integrates traditionally academic coursework into a technical training program. It is a program that is totally academic and totally vocational, leading to both an advanced educational degree and a career. It involves both industry and postsecondary personnel in its planning to ensure that the education and training the students receive are relevant to the skills and competencies required to meet both college and the employer's performance standards.

What is CHSAS?
The Chicago High School for Agricultural Sciences (CHSAS) is a college preparatory program which prepares young people for professions in the over 200 careers in agricultural sciences, such as animal science, plant science, and food science. The "Ag" school, located on the 72 acre "Last Farm" in Chicago, serves as a model for agricultural, vocational, and program-focused schools. At the core of the college curriculum is the problem-solving method, using the hands-on, practical applications approach. Highly motivated students of differing levels of ability travel from all corners of the city to attend this magnet school.

The CHSAS curriculum includes a variety of academic and agricultural science subjects, which will enable students to exceed the required and elective courses necessary for a high school diploma. All students are required to enroll in college prep courses such as algebra, geometry, advanced algebra, trigonometry, biology, chemistry, physics, and foreign language, in addition to four years of agricultural science classes.

The F. R. E. E. Program
In 1991 we began planning our Food Science Tech Prep program. It was very easy for me to envision how and where a student with this type of degree would fit in the food industry, because that is my background. My degree is in food science, and I worked in the food industry for 10 years before becoming a teacher. As a food scientist, I knew that laboratory technicians with this type of education and training would be highly desired in the food industry.

As a teacher, I saw how this program
might revitalize some of the students in my classroom who stared back at me with dull eyes or disinterest. These students, who had no idea how algae, chemistry, English, or agriculture could ever impact their lives, who thought college or a rewarding career was beyond their reach, monetarily or academically, who were convinced that they were powerless over a system that has a high unemployment rate for high school graduates and scholarships only for the top 20% of the class, can again believe there is a purpose to school if engaged in a Tech Prep program.

How To Begin
At the heart of every successful Tech Prep program is an advisory board or planning team. The F. R. E. E. Advisory Board was built gradually as we readied ourselves academically for this program. Members include academic teachers, vocational teachers, high school administrators, college administrators, counselors, industry representatives, parents, students, and community representatives.

We found that the best way to develop this program was to work backwards, that is, to identify the competencies that we wanted the students to graduate with and then design a program that would fulfill these expectations. We relied very heavily on industry to determine these competencies, and we were not surprised that about half of them were not job specific. Better communication and basic math skills topped the list, as might be expected.

Developing The Program
Based on the competencies determined by the advisory board, we began to develop the F. R. E. E. program. Remembering that integration of academics is a key element to this program, both vocational and academic teachers were involved in writing curriculum. Academic teachers were asked to research a competency required by the F. R. E. E. and develop a lesson plan to integrate their academic subject into the F. R. E. E. class. For example, the chemistry teacher, Sam Hall, was asked to prepare a lesson plan on solubility, and integrate it with a lab activity on syrup production to demonstrate how temperature influences solubility. This is a wonderful example of how a scientific principle can be presented in a very applied, non-threatening manner.

It was decided that students opting to enter the F. R. E. E. program would not be "tricked" in their other classes and would take a full academic schedule including algebra/trigonometry, physics, and foreign language. Tech Prep is not just another vocational program for the "dumb"; it best serves students who fall between the 25th and 75th percentile in academic ability. The agricultural options courses for P. R. E. E. students are:

- Introduction to the Food Industry
- Applied Communications
- Food Chemistry
- Food Microbiology

We agreed that to make this program attractive and credible to the students and to cement the industry commitment there had to be a job component. We decided to offer summer jobs, in keeping with our academic focus, instead of a work-study program. This served us two-fold: an incentive for students to get into the program and an incentive to pass all classes so that their summer would be free to work.

Implementation
Recruitment efforts began in February 1992, when all sophomores were given a presentation on the F. R. E. E. program. Students were watched a video on careers in the food industry produced by the Institute of Food Technologists and were encouraged to try to picture themselves as one of the people they saw in the film. At the same time, I asked all sophomore teachers and counselors to recommend students they thought would benefit from the program.

We accepted 23 students into the program on April 22, 1992 and began our 1st year of Tech Prep in September. Our goals were:

- to improve student G. P. A.
- to improve attendance
- to improve student work habits in two areas
- to increase standardized test performance in reading and math
- to increase student participation in

Small Schools...
example, sponsored a class on bovine reproduction. Nearly 1200 farmers were in attendance to hear the lecture and eat ice cream sundae's provided by the clinic. One veteranarian also mentored a young student in the FFA Agriscience competition. As a result of her project, she was a scholarship winner.

A.F.R.E.E. Guide...

Principal Ed Burns is a valuable part of the agriculture department. Shown here, Burns is inspecting an exhibit for the state fair show. (Photo by Diana Erman)

Collaboration with other agricultural agencies proves to be beneficial to all groups involved. County extension agent Dave Swartz and I work together throughout the year doing animal registration for the state farm show, county fair events, adult education, and dairy school classes. Swartz, a fellow Penn State classmate, has taught programs covering dairy nutrition, manure management, and ground water protection for the Greenwood agriculture department. "This type of cooperation helps us reach more people," he says, "and we really complement each other's program." In addition, Roger Dressler, from the Pennsylvania Department of Agriculture, presents a pesticide certification workshop to the school each March.

Although Greenwood School District is rural, few families generate their entire income from production agriculture. The relevancy of the department's contemporary programs need to be marketed to the community. This was done by形成ing a series of mutually beneficial collaborative relationships which have enabled the school district to provide an agriculture program that touches the dairy owner and the hobby gardener, the high school student and the adult learner, the town resident and the county farmer.
Blending Outcomes Based Education and Tech Prep

In a world where the information we have on any given subject doubles about every 12 years, where 50 percent of the jobs performed today didn’t even exist 20 years ago, and where 20 years from now 90% of the information a worker has to cope with on the job will have been created after today, the only constant is change. And the only security in such a world is understanding that change and adapting to it.

P. D. Pyke, Chase Manhattan Bank

Colorado agricultural education has a rich history, dating back before the SmithHughes Act of 1917, but supporting production agriculture. In a state with rural counties outnumbering the larger urban or suburban metro areas six to one, where 60% of the students and faculty are in four agriculturally related industries; where the overall revenue gains produced from agriculture exceed $27 billion dollars; and where farm and food products are the area of choice for many of the residents, production agriculture has been valued for generations.

Yet, present day agricultural education is in transition away from its production agriculture roots, but it has the level of entrepreneurial opportunities in production agriculture, greater efficiency of agricultural practices, an emphasis on advanced technology, and an accessible global marketplace have brought about changes in traditional agricultural education delivery systems. Young men and women completing agricultural education programs in the 1990s are more likely to be consultants, processors, and suppliers to the actual producers of food and fiber. Today’s progressive instruction may more likely emphasize animal and plant sciences, economics, marketing, computer applications, and integrated resource management.

The modern workplace requires advanced technical skills from the ability to understand complex theories and processes in rapidly changing and emerging technologies. Most jobs require skills beyond those taught in high school, and earning potential requires a working knowledge of math, science, technical principles, and information/computer literacy skills. However, industry has acknowledged that students are inadequately prepared for the world of work. According to the Wisconsin Board of Vocational, Technical, and Adult Education (1993, p. 3), “The majority of high school graduates enter adulthood without the education and skills to allow them to achieve their full potential.” Furthermore, the lack of highly skilled technicians is reported as preventing the American industry from being more competitive in the global marketplace.

Given this need to shift away from traditional agricultural education practices and the parallel need to produce more highly skilled and better paid agricultural technicians, a Tech Prep initiative was launched for agricultural education programs in Northern Colorado. Through this effort, secondary and postsecondary agriculture programs were joined in a partnership to produce integrated and articulated curricula and to identify delivery strategies for the present and future industry.

Initially, the Tech Prep project established a consortium of participants, which included two community college campuses and 12 high school programs. Agricultural education staff at Colorado State University agreed to serve as mentors for the program. According to Dr. Clayton Whiffler, Vice-President of Educational Services, Colorado Community Colleges and Occupational Schools, “This consortium model expanded the limits of program content and redfines the limits of instructor responsibility. It is based on students’ needs, recognizing that there are opportunities for employment in continuing education.”

Essential to the success of the Tech Prep effort was the adoption by consortium members of the Outcomes Based Education (OBE) format for constructing the articulated curriculum. OBE is the process of defining curricular content in terms of learner outcomes (what is to be taught). It assumes an empowerment-orientation in which "the outcome is defined as a successful demonstration of learning that occurs as at the culmination point of a set of learning experiences" (Spady and Marshall, 1992, p.14).

Under this OBE implementation approach, fewer entry level entrepreneurial opportunities in production agriculture, greater efficiency of agricultural practices, an emphasis on advanced technology, and an accessible global marketplace have brought about changes in traditional agricultural education delivery systems.

local staff take the curricular content and structure, that currently exist and determine those course elements needed truly needed for students to learn a high degree of performance. Once these curricular outcomes are identified, they are used as the basis for curriculum, instructional design, and evaluation. Finally, outcomes at the secondary and postsecondary levels are aligned to provide a continuum of essential educational experiences which eliminate or reduce loss of credit, delays, and unnecessary duplication.

Participants in the Northern Colorado Tech Prep Consortium agreed to undertake an intensive examination of existing curricula and to produce a revised curriculum utilizing OBE. Initial meetings with consortium members focused on efforts to get school teachers, postsecondary instructors, and school administrators to "buy in" to the need to restructure existing curricula in agricultural education. Panels of agriculture industry representatives were brought before consortium members to discuss their expectations of the industry’s need for a trained workforce. Industry leaders confirmed the need for well prepared employees and stressed the importance of life skills in concert with high level technical skills for today’s workforce. Education leaders experienced in OBE also shared their insights and recommendations with consortium members.

Early efforts produced the document "Essential Life Skills for Today’s Workforce: Suggested Massachusetts Outcomes and Competencies Needed for Use in Developing Secondary Agricultural Education Programs of Study in Colorado". This document addressed educational outcomes in the following categories: a) interpersonal skills, b) work ethics and behavior, c) self-management, d) higher order skills, e) communication skills, and f) mathematical skills. The document was used as a vehicle to professionalize the farmscences as they defined the essential life skill outcomes of their instructional programs. Subsequently, offer grant, current and adopt technical and skill-based outcomes in agricultural content which are needed by program completers. Both documents were utilized at each institutional site to aid teachers in developing a progressive curriculum in agricultural education. Local program advisory committees and educators who advise the program be asked to provide input and validate the identified outcomes.

As outcomes were identified, consortium members initiated efforts to develop and adopt articulation agreements between the secondary and postsecondary systems. Although most Tech Prep articulation agreements traditionally operate on a "2+2" basis (two years of high school and two years of postsecondary education), this consortium engaged in a "2+2+2" cooperative relationship, which included articulation with Colorado State University. Currently under development, these agreements are intended to be used to maximize the continuum of educational experiences in agriculture, from secondary through the postsecondary levels.

Further efforts were launched in the Colorado consortium to assess the effectiveness of the total Tech Prep effort. Data collection were obtained on student retention rates, grade point averages, college board exams, and college admissions. Portfolio assessments of program completers will be compared with baseline data to determine the effectiveness of this Tech Prep initiative.

The experiences of this Colorado Tech Prep program in agricultural education have produced strategies and recommendations for future efforts:

1) Teachers and school administrators (principals) are the ones who facilitate systemic programmatic changes, thereby directly affecting the success of the Tech Prep efforts. Teachers and administrators must be included in all phases of planning, implementation, and evaluation.

2) Faculty members from each school should participate in the identification and evaluation of learner outcomes. Counselors should also be included in promoting student recruitment into the program or monitoring student progress.

Secondary faculty should view Tech Prep as a means of assisting their students in moving more rapidly and with a higher level of technical competence into the workforce or to an advanced educational level. Postsecondary faculty should use Tech Prep as an asset to their programs, providing the postsecondary institutions with enhanced, competent, and qualified learners.

Outcomes Based Education provides a viable curricular approach for rethinking the content and delivery of relevant instruction.
A Statewide Alliance for Improving Adult Education

Many changes in agricultural education in Illinois were recently sponsored by the Illinois Leadership Council for Agricultural Education (ILCAE) starting in 1994. One of the most encouraging results of these changes was the development of a K-Adult plan for improving agricultural education. While most of the early efforts were focused on improving the secondary and K-8 programs, adult agricultural education has recently begun to receive more attention.

In the spring of 1991, representatives of the major contributors to adult agricultural education in Illinois formed the State Adult Agricultural Education Committee (SAAEC). It was composed of representatives from secondary and community college agriculture programs, universities, Cooperative Extension, Farm Bureau, Illinois Leaders in Agriculture (Young Farmers), and the State Department of Adult, Vocational, and Technical Education. A field advisor from the Facilitating Coordination in Agricultural Education (FCAE) project was appointed as chairperson.

It was determined at the first meeting that the SAAEC would function as an advisory committee to the Illinois State Board of Education and to the Illinois Committee on Agricultural Education (ICA). The committee also agreed that their purpose would be to "determine the most efficient and effective delivery systems for adult agricultural education in Illinois, and to promote their implementation." In a subsequent meeting, the committee reviewed and adopted the definition of adult education in agriculture as previously adopted by the National Adult Education Task Force (1991). This was particularly useful as it provided a framework and focus for the committee's work.

After the initial meeting, the committee spent considerable time sharing information concerning how each organization conducted adult agriculture and what kinds of programs were included. This awareness development process was essential to understanding another's problem and gaining an overall perspective that would be necessary to develop an effective and efficient delivery system.

The SAAEC recognized that each community had many more contributors to adult agricultural education than were represented on the committee. To obtain valuable information pertaining to these grassroots constituents, five district level focus group meetings were conducted across the State. These focus groups consisted of representatives from each focus group, community college programs, Cooperative Extension, and Farm Bureau. The focus group members were selected based on their interest and experience in adult education. Four purposes were identified for these meetings:

1. Gather local input regarding the nature and scope of current cooperative activities;
2. Identify success, benefits, and barriers related to the cooperative efforts;
3. Identify the need for new or expanded cooperative efforts; and
4. Identify the need for coordinating adult education at the local, regional, or state level.

The focus group meetings proved to be quite worthwhile and provided a valuable perspective to the SAAEC. Of particular interest was the fact that while most members of the focus groups were connected in some degree of cooperation with one another and with other local agencies, there was no overall coordination of programs or any comprehensive local planning. Thus, there were instances of competing programs, duplication of programs, and underutilization of available expertise and facilities. A descriptive survey was used to gather additional information from the focus group members. There were 34 respondents to the survey, and the following results were obtained:

1. The focus groups primarily consisted of experienced, well-educated males. Their main involvement in adult education entailed organizing, coordinating, promoting the programs. Few did any actual teaching.
2. Seventy percent indicated that they cooperated with other programs. Major cooperators were community colleges, Cooperative Extension, and agricultural business and industry. Less often mentioned cooperators were public service and health agencies.
3. Agricultural producers were the largest group served, followed by the general public. Agricultural service and supply was the most served industry group. Farm Bureau programs were primarily for managers; community college and Cooperative Extension programs were oriented more for employees.
4. The total median number of adult programs provided by each focus group was 55. Cooperative Extension provided the greatest median number with 22.
5. Seventy percent of adult programs were in agriculture subject matter areas. Twenty percent of the programs were in agriculturally related subjects. (Percentages are median numbers.)
6. The focus group members generally believed that their programs would benefit from more coordination, but they felt that barriers currently exist that prevent coordination from occurring. However, they also believed that the barriers can be removed.

The SAAEC recognized that the above information was gathered from a select group of individuals who had an interest in adult education and was not statistically representative of the entire state.

The efforts of the SAAEC and the results
promoting the survey were summarized in a resolution addressing cooperation and coordination among all entities involved in adult agricultural education. This resolution, shown below, was submitted to all agencies for approval by their respective executive boards or executive officers. It was adopted and signed by representatives of all agencies involved in the SAAEC during the Annual Illinois Farm Bureau Conference on December 8, 1992.

RESOLUTION

Each of the undersigned entities hereby adopts the following resolution:

WHEREAS, the food and fiber industry in the State of Illinois consists of progressive and innovative businesses, and requests timely, educational information which improves their management decision making, and net income.

WHEREAS, we recognize the need for adult agricultural education and place it as a high priority.

BE IT RESOLVED, that this effort be implemented in the following manner:

1. The University of Illinois Cooperative Extension Service (CES) shall serve as an information clearinghouse to facilitate improvements in adult agricultural education.
2. Organize adult agricultural education by community college districts with one person serving as coordinator.
3. All program planning or advisory committees should include representatives of appropriate agricultural efforts.
4. Recommend the Agricultural Education Supplemental Funding Application for expanding implementation of the model to reward educators for their efforts with adult education programs that result from cooperation with another entity.
5. Develop coordinated adult education planning schedules for all entities.
6. Seek the addition of a new Facilitating Coordination in Agricultural Education (FCAE) staff position to promote programs in adult education and agricultural literacy.
7. Seek additional funding to fund adult education programs.
8. Support pilot projects and utilize new communication technology which promote improvements in adult agricultural education, and
9. All agencies involved adopt policies which advocate and reward cooperative efforts in planning and implementing adult agricultural education.

Mr. Charles Williams, "Agricultural Education Coordinator, Illinois State Board of Education, Rock Island, Illinois"
Mr. Howard Whitaker, "Director of Curriculum, Illinois College of Agriculture and Forestry, Normal, Illinois"
Mr. John Adams, "Director of Extension, Illinois State Board of Education, Normal, Illinois"
Mr. John Neely, "Director of Rural Development, Illinois State Board of Education, Normal, Illinois"
Mr. Jack Robinson, "Director of Curriculum, Illinois College of Agriculture and Forestry, Normal, Illinois"
Mr. Richard Treat, "Regional Coordinator, Illinois State Board of Education, Normal, Illinois"
Mr. James Smith, "Regional Coordinator, Illinois State Board of Education, Normal, Illinois"
Mr. James Jones, "Regional Coordinator, Illinois State Board of Education, Normal, Illinois"
Mr. James Brown, "Regional Coordinator, Illinois State Board of Education, Normal, Illinois"
Mr. James Davis, "Regional Coordinator, Illinois State Board of Education, Normal, Illinois"
Mr. James Garcia, "Regional Coordinator, Illinois State Board of Education, Normal, Illinois"
Mr. James Pearson, "Regional Coordinator, Illinois State Board of Education, Normal, Illinois"
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Mr. James Johnson, "Regional Coordinator, Illinois State Board of Education, Normal, Illinois"
The SAAEC believes that the resolution will have a number of positive implications for Illinois adult agricultural education. These include: 1) more efficient use of the resources available for adult education; 2) better coordination and better attendance at programs; 3) less duplication of programs, which may allow expansion of offerings; 4) better communication among agencies, enabling programs to assist local coordinating committees in programming; and 6) expanded access to additional resource persons and their areas of expertise to better meet client needs.

The resolution signing was viewed by the SAAEC as an important first step. Without the approval and support of top management, the coalition did not believe their efforts would have much effect. The committee is now addressing the second part of their adopted purpose—implementation. Strategies for organizing coordinating committees in each of the 54 community college districts are being developed. The first coordinating committees will be formed within districts that have community college agriculture programs. These committees are expected to be in operation by the fall of 1993. A model coordinating committee has already been formed within one district, and information obtained from this project will be used to develop operational guidelines for other committees. In addition, the Cooperative Extension Service has agreed to establish the adult education database and clearhouse within the facilities at the University of Illinois campus, with initial planning already underway.

The SAAEC has come a long way from its initial meeting. While there may certainly be other ways through which adult education can be improved, this approach so far has shown great promise in Illinois. Some of the more important actions which contributed to the success of the SAAEC to date are: 1) identifying individuals who were committed to improving adult education to serve on the committee, 2) developing a well-defined purpose and visible objectives, 3) providing time to allow committee members to learn about each other’s organizations (size, scope, philosophy, strengths, and weaknesses), 4) gathering grass-roots input on which to base recommendations, and 5) obtaining recognition and acceptance of the committee and its resolution from top management.

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**Blending Outcomes cont...**

*continued from page 11*

Yet, ORE is not without controversy. Headlines in The Coloradan (March 10, 1993) reported that "Parents try to stop outcome-based education." A February 14, 1993 article in the same local newspaper stated "Outcomes-based education: True test of skills or touchy-feely failure?" Obviously, without the essential "buy-in" of all those affected by the Tech Prep efforts, there will be suspicion and misunderstandings. Therefore, open communications are needed at every step.

Linking secondary and postsecondary programs in agriculture is one of the primary goals of this Tech Prep Consortium. The demand for this effort has been created by the changing economic, technological, demographic, and educational forces of the agricultural industry.

Through collaborative efforts by teachers and administrators in Northern Colorado, a new strategy for delivering appropriate educational and cultural education has been implemented. Through an Outcomes Based Education format, a new curriculums has enabled Tech Prep participants to better meet the needs of this vibrant industry.

For business and industry, successful Tech Prep programs have implications for regional and national competitiveness. In states where workers lack high school credentials and essential work skills, where large numbers of high school students opt out of further education, and where employers are asking for better qualified technical workers, Tech Prep's potential to revolutionize occupational preparation (Scott, 1991, p.63) Tech Prep can be the vehicle necessary to introduce and implement school reform and change.

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**References**


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**THEME ARTICLE**

**Futures Studies as Curriculum Building Blocks for the 21st Century**

**By Maynard J. Iverson**

Dr. Iverson is associate professor and head of agricultural education at the University of Georgia, Athens.

W**e should all be concerned about the future, because we will have to spend the rest of our lives there!**

- Charles Kettering

The mind of man is capable of anything because everything is in it, all the past as well as all the future.

- Joseph Conrad

Curriculum is the key to the future of agricultural education, for it is the prediction of the future skills of our students. Unfortunately, while buildings, equipment, and personnel may be relatively permanent, curriculum is perishable; it has a short shelf life and can become outdated before we realize it. When this happens, outsiders will often call on our attention to the need for change.

This happened in the 1960’s with the Vocational Education Act of 1960 and the 1968 Amendments, which legislated a broadening of the vocational agriculture program. In the 1980’s, state legislatures got into the act, in many states, the agricultural education program was impacted by state legislative mandates and by the increase in local control. A number of states, including Georgia, responded by hosting “futures conferences.” At these events participants representing major constituent groups made recommendations for improving the agricultural education program. Curriculum modification was a frequent recommendation (Sheppard, 1989). The publication of the National Summits gave further impetus to curriculum change.

The Time-lag Dilemma in Curriculum Development

Traditionally, curriculum development is based on the past, or at best, the fleeting present

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**Figure 1. Traditional model of curriculum development.**

**TRAditional Model.**

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<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
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</thead>
<tbody>
<tr>
<td>Occupational &amp; Task Analysis</td>
<td>Development</td>
<td>Dissemination &amp; Implementation</td>
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Delphi technique. The Delphi researchers in Georgia conducted extensive reviews of the literature on their respective areas of agriculture. In most cases, few projections were found that went beyond five years. Consequently, the researchers searched trade journals, popular magazines, conference proceedings, and current media for ideas related to the future of their respective fields. Literally hundreds of statements were generated; the researchers used review panels composed of experts from the technical fields and from education in order to reduce the lists to fewer than 100 statements for the final data-gathering instruments.

At the same time, nominations of the most futuristic thinkers in the field were solicited from state and national trade associations, university departments, and Cooperative Extension specialists in the respective technical areas. The 20 to 30 individuals who received the most nominations were then asked to serve on a Delphi panel. The results of the first-round round were included in the second-round instrument, so each Delphi panelist could observe how the other members had rated the items. Respondents' comments were also included with the second round so that panelists could see the reasons why others responded as they did. After two rounds, when little movement in ratings was observed, the researchers analyzed the results and summarized the items on which consensus had been reached into curriculum areas that would be most important in the future.

Studies have been completed in the areas of nursery/landscape (Flanders, 1988), meats →

Forest Industry
- Exchanged species
- Forested area
- Forest protection
- Genetic inheritance
- Global markets
- Government regulations
- Government production
- Industry certification programs
- Irrigation pest management
- Managing natural resources

Greenhouse Industry
- Advanced irrigation techniques
- Management skills
- Computerization
- Educational needs of greenhouse personnel
- Effective communication
- Environmental control systems
- Environmental protection

Dairy Industry
- Dairy cattle judging and evaluation
- Dairy production and technology
- Dairy processing
- Dairy and agri-business management
- Range production and management
- Soil health

Leadership and personal development
- Marketing program and by-products
- Milk services
- Quality control techniques
- Record keeping and management
- Research

Already a reality in many urban centers, intercropping will be widespread in the 21st century. (Photo courtesy of the Agricultural Communications Department, The University of Georgia)

Conclusions
We believe that the curriculum in agricultural education should be futuristic, that the Delphi technique is an effective method to achieve this futuristic orientation, and that successful curricula of the future will utilize both task analysis and futures research. If we are to avoid the criticism and mandates of outside forces, we must utilize forward-looking strategies to program development. In Georgia, we stand ready to cooperate with educational officials in other states who look to the future in program planning and implementation. The results of our futures studies should be tested by teachers and curriculum specialists and then incorporated into the curriculum development process. Your ideas for accomplishing this process are solicited.

References
Strengthening Programs Through an Expanded Model for SAE

The Swiss were not willing to change and have suffered the consequences. At one time they dominated the timepiece market, but today the Japanese are the world leaders. The reason for this is because the Swiss were not willing to change the way they made watches. When they discovered the quartz movement for watches, they rejected the idea. It did not fit into the Swiss paradigm of watchmaking, which said watches must have mainsprings and balance wheels. They didn’t even patent the invention. The Japanese adopted the quartz movement and the rest is history.

Over the years, the project method of teaching and its offspring: the supervised farming program, the supervised occupational experience program, and now the program of supervised agronomic experience has served agricultural education well. When the idea was promulgated in 1968 by Rufus Stimson of Massachusetts, it was accepted and adopted in agricultural education and in most other areas of education. Agricultural education was the leader in educational reform as the "project" replaced the dry, boring, recitation method of that era. But in this era of integrating academic and vocational education and developing critical thinking skills, a new paradigm for Supervised Agricultural Experience must be embraced. If we don’t, we may get left behind in the educational arena like the Swiss were in the watchmaking arena.

An Expanded Model For SAE

The National Research Council (1988) in Understanding Agriculture: New Directions for Education recommended that the relevance and scope of SAE be broadened. In response to this recommendation, a national task force on SAE was convened to work on enhancing the SAE program. A model developed by the task force was described in the December, 1992 issue of this magazine. The model has been expanded and refined and expanded it even further. New components were added, and some of the traditional components that were not easily visible in the task force model were included. The expanded model is graphically depicted in Figure 1. This model recognizes that agricultural education has two outcomes:

- **agricultural literacy and career preparation.**

The model replaces the traditional components of SAE, such as entrepreneurship and placement, but adds new components designed for students in agronomy classes, agromarketing classes, and other emerging areas in agriculture. A discussion of each component of the model follows.

**Major Components of SAE**

**Experiential -** This type of SAE is appropriate for beginning agronomic students but is not restricted just to beginning students. This SAE activity is designed primarily to help students become literate in agriculture and thus become aware of possible careers in agriculture. Examples of exporatory SAE activities might include observing and analyzing data, interviewing an agricultural loan officer in a bank, preparing a scrapbook on the work of a veterinarian, and growing plants in a milk jug "greenhouse." The teacher will need to establish minimum standards (hours required for each exploratory activity and/or number of exploratory activities). Records are to be kept by the student. For an in-depth discussion of exploratory programs, see Arting's article in the December 1992 issue of this magazine.

**Entrepreneurship -** Simply stated, the student owns and manages some type of agricultural enterprise, such as a cherry orchard, or an agricultural business. Examples of entrepreneurial activities include growing an acre of corn, operating a Christmas tree farm, or managing beehive plants, raising a litter of pigs, owning a lawn care service, and a student cooperative growing potatoes. Moody (1992) describes entrepreneurship programs in detail in the December issue of this publication.

**Placement -** Placement has been a major component of SAE since the 1960s. Students are placed in jobs in agribusiness firms, in school or community facilities, and on farms or ranches. This is typically done outside of normal classroom hours and may be paid or non-paid. Students keep records as to how many hours worked, type of work activities performed, and wages. Examples of placement SAE include working after school at a farm supply store, placement in a threshing crew, working on Saturdays at a riding stable, and working in the school greenhouse.

**Analytical -** Not all of the analytical activities in which students may participate can be clearly classified as research, entrepreneurship, placement, or experimental. For example, a student in an agrimarketing class may complete an in-depth market analysis of an agricultural commodity and follow that activity with simulated trading activities in the commodities market over an extended period of time. This is more involved than expository but doesn’t fit into the other categories.

Another example is a student who is interesting in agricultural journalism and writes a series of articles on agricultural commodities for the local newspaper. The student may not necessarily be considered an experiential student or have actually had a placement agreement with the newspaper.

The SAE program involves an extensive amount of research and analysis and requires students to place their opinions and thoughts on (continued on page 19).
Using Evaluation to Strengthen Programs

The last decade of educational reform has placed emphasis on improving the quality and accountability of programs. The educational reform movement first became apparent with the release of A Nation at Risk: The Imperative for Educational Reform (National Commission on Excellence in Education, 1983). More recently, other reports (U. S. Department of Education, 1991; Commission on Skills of the American Workforce, 1996; Secretary’s Commission on Achieving Necessary Skills, 1991) have echoed the concern for reforms in education and recommended future directions.

The report Understanding Agriculture: New Directions for Education (National Research Council, 1988) concluded that the quality of agricultural education must be enhanced, "in some cases substantially" (p. 4). If people in your community asked about the quality of your agriculture program, what would they say? Would parents want their children to enroll in your program? Would they view your program as potent, effective, and efficient?

Teachers of agriculture are often wanting to strengthen and improve the quality of their programs. This means that they need objective information from which they can make decisions regarding future directions. Evaluation can help provide information for addressing this concern. Worthen and Sanders (1987) defined evaluation as the act of rendering judgments to determine the value and merit of a program in terms of the use of educational information to improve programs.

A question often arises in the evaluation process regarding the types of information that can be used to judge the value of a program. Much of the current literature on educational reform has only emphasized information about student outcomes. However, if outcome information is all that is available, what was the "added value" that the program provided? To what extent did students’ prior knowledge and/or community expectations impact the outcomes? How can agriculture teachers determine what worked and did not work in attaining desired outcomes? What should be changed if agriculture students are to achieve at higher levels? McCaul (1990) proposed that evaluation include valid and reliable information of three types:

1. the need for programs as expressed by the clients (who is, students and employers) and society;
2. the processes followed by education programs; and
3. the outcomes achieved by education programs.

Needs for Agricultural Education

What is meant by the term "needs?" Kaufman and Stone (1983) argue that needs are gaps that occur between "what is" and "what ought to be" in terms of program results. Once these gaps have been identified, they must be placed in priority order.

Three sources from which to gather information about agriculture program needs are students, prospective employers, and society in general. Students enrolled in our programs can provide excellent information regarding their interests, knowledge, attitudes, and skills. Prospective employers can provide valuable input regarding the knowledge, attitude, and skills that they seek in prospective employees. Finally, information regarding the educational, economic, and social needs of society should be collected from groups such as taxpayers and policy makers (e.g., school administrators, school board members, county commissioners, city and town councilors, and legislators).

Processes of Agricultural Education

What should we do to help ensure and enhance a high quality program? How can we identify a strong, accessible, and relevant program? One way is to gather evaluative information on the processes of agriculture programs. Process information provides the evaluator with a basis for understanding and interpreting the results or outcomes of a program. Six types of process information can be used in evaluating the quality of agriculture programs. These include: 1) Organizational Information; 2) Program Information; 3) Support Services and Activities Information; 4) Student Information; 5) Staff Information; and 6) Community Information. Information about the program can be obtained through interviews, observation, reviews of existing documentation, and surveys.

In agricultural education, organizational information answers the question of how the program behaves and operates within a broader environment of the school system. Information related to organizational structure, facility location, organizational climate, administrative style, teaching style, and the type of school (e.g., comprehensive, vocational-technical, career center) are types of organizational information.

Program information relates to how agricultural education is conducted. Information is important in determining what changes need to be made in or determining how to implement similar programs in another location. Possible areas for gathering information on the program include goals and objectives, instructional content, instructional delivery methods, administrative support, recruitment activities and efforts, facilities and equipment, and cost.

Support services and activities offered by and to agriculture program are important in process evaluation efforts. Such services and activities include career counseling, job placement services, adult education programs, program planning and evaluation activities, the FFA organization, and teacher development activities.

Staff information on the agriculture teacher(s) and administrators is an important element of process evaluation. The types of information required from staff include demographic characteristics, educational experiences, educational competence, occupational experiences, and occupational competence.

The need for process information regarding the type of students served is also important. The inclusion of data on both students’ demographic characteristics and their educational achievements.

Although sometimes overlooked, the community serves as another important source of process information. Community information helps answer questions regarding involvement and relevance. What does the program do to involve students in the community? Additionally, how does the program make instruction relevant to the community? Types of community information include: linkage with agriculture and industry, articulation with other educational agencies or programs, and the type of community.

Outcomes of Agricultural Education

The current emphasis in evaluation is on documenting educational effectiveness in terms of student outcomes. In agricultural education, we often refer to outcomes as the results or accomplishments of students in our programs. Other terms such as core standards, measures of performance, and program standards are also used in reference to student outcomes. An outcome might consist of a single statistic or a composite measure.

Traditionally, agriculture teachers have only thought of student outcomes in economic terms as measured by their experiences in the labor market. More recently, these student outcomes have been expanded to include educational and psychosocial outcomes. Examples of these three types of outcomes are presented below:

Economic Outcomes

Labor Force Participation Rates

Employment and Unemployment Rates

Training-related Placement Rates

Type of Employment

Earnings

Job Satisfaction with Work

Employee Satisfaction with Work

Educational Outcomes

Academic Skills

Higher-order Thinking Skills

Knowledge of the World of Work

Occupational Skills

School Attendance and Dropout Rates

Continuing Education Rates

Student Satisfaction with Education

Psychosocial Outcomes

Aspirations

Attitudes and Values

Self-esteem

Citizenship

Leadership

Summary

If agricultural education is to provide students with the knowledge, skills, and attitudes they need to compete in the marketplace and lead meaningful lives, then evaluation of our programs becomes an important part of the process. For us to have a more comprehensive evaluation program, it would be necessary to include information related to the needs, processes, and outcomes of agricultural education programs.

References


(Continued on page 23)
A Laboratory Experiment in Agriscience

Live Chick Embryos

Materials
- Glass plate or bowl
- Dissecting microscope or hand held magnifying glass
- Fertile chicken egg (72 hours old)
- Filter paper
- Scissors

Special Notes to the Instructor
** Before beginning this exercise, all students should have an understanding of chick embryology before opening their fertile egg.
** Fertilized eggs can be obtained by contacting sources located in the Poultry Press Magazine, P. O. Box 52, Cornerville, Indiana 47331 (317) 827-0932.

Procedure

Part 1
1. Each pair of students will be provided with a chick embryo that has been incubated for 72 hours.
2. Each pair of students will have a small dish or bowl to place the fertile contents of the egg into. Add a little warm saline (0.9% NaCl) to the bowl prior to cracking the fertile egg.
3. Take an egg from the incubator, hold it in exactly the same orientation, and carry it carefully to the work area.
4. Turn the egg sideways and wait 1 minute for the yolk to adjust.
5. Tap the egg on the edge of the dish until the shell cracks.
6. Hold the egg in the saline, pry the shell apart at its bottom without disturbing the upper surface of the yolk.

Instructor: If the embryo is fertile the students should see the embryo and its beating heart immediately. If you do not see the embryo then one of two things has occurred: (1) the embryo failed to develop or (2) the yolk is turned upside down so that the embryo is hidden.

Part 2
1. After the students have observed as much structure as you can in the dissecting microscope, remove the embryo from the yolk, and transfer it to the glass bowl so that you can see it more clearly. Complete the following steps:
   1. Fold a piece of filter paper in half and cut out a spoon with a hole just larger than the embryo.
   2. Add a teaspoonful of warm saline in the bowl. The top of the yolk MUST NOT BE COVERED BY SALINE.
   3. Lay the filter paper spoon on the yolk so that the embryo is shown through the hole.
   4. Press down gently on the paper with your probe, if necessary, so that it is wet all around and sticks to the membrane.
   5. Cut the membrane in a circle around the outside of the filter paper to free the embryo.
   6. Lift the spoon in the dish and observe the attached embryo under the dissecting microscope.
   7. A drop of Vital Stain such as 1% Neutral Red may be added to bring out the embryo's structure.

Reminders: The chick embryo must be kept warm and moist. The egg is opened in saline and the embryo is transferred with a filter paper spoon.

Streng. Prog. Through . . .

(continued from page 19)

the line. Students who choose an analytical SAE must identify an agricultural problem that is not amenable to experimentation, and design a plan to investigate and analyze the problem. The student will gather and evaluate data from a variety of sources and then propose one type of finished product. The product could be a marketing display or marketing plan for an agricultural commodity, a series of newspaper articles, a land use plan for a farm, a detailed landscape design for a community facility, an advertising campaign for an agricultural business, and so forth. An analytical SAE is flexible enough so that it could be used in any type of agricultural class, provides valuable experience, and contributes to the development of critical thinking skills deemed so important in education today.

Minor Components of the SAE Program

Each student in the agricultural education program should have an exploratory, entrepreneurial, placement, experimental, or analytical SAE, or a combination of these. They provide experiential learning activities that will help students learn more about agriculture and can lead to agricultural literacy or establishment in an agricultural career. In addition to these major SAE activities, there are two minor components of an SAE program—improvement and supplementary activities. These minor components in and of themselves do not comprise an SAE program, but they can be valuable supplements to the SAE program. A comprehensive SAE program will include both improvement activities and supplementary activities.

Improvement - Improvement activities include a series of learning activities that improve the value or appearance of the place of employment, home, school, or community; the efficiency of an enterprise or business; or the living conditions of the family. An improvement activity involves a series of steps and generally requires a number of days for completion. Examples of improvement activities include landscaping the home, building or renovating a farm shop, computerizing the records of an agricultural business, and renovating and restocking a pond.

Supplementary - A supplementary activity is one where the student performs one specific agricultural skill outside of normal class time. This skill is not related to the major SAE but is normally taught in an agriculture program, involves experiential learning, and contributes to the development of agricultural skills and knowledge on the part of the student. The activity is often accomplished in less than a day and does not require a series of steps. Examples of supplementary activities include pruning a fruit tree, fertilizing a lawn, helping a neighbor castire pigs, and changing oil in a small cutter.

Summary

The SAE components described in this article should provide agriculture students with valuable, experience-based learning activities that will help prepare them for the future. The first SAE component can be exciting and help for students if the agriculture teacher introduces them properly. Additionally, students should be hard pressed to have a valid excuse as to why they can't have an exploratory, experimental, or analytical SAE. Any student can participate in these types of activities.

Note: The authors have developed an SAE record book that fits this model. For more information contact them at Box 7801, North Carolina State University, Raleigh, NC 27695.

References


Using Evaluation To . . .

(continued from page 21)


<table>
<thead>
<tr>
<th>Issue/Theme</th>
<th>Due to Theme Editor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>January</strong> Tech Prep</td>
<td>October 1, 1993</td>
</tr>
<tr>
<td>February</td>
<td>November 1, 1993</td>
</tr>
<tr>
<td>Distance Education</td>
<td></td>
</tr>
<tr>
<td>March</td>
<td>December 1, 1993</td>
</tr>
<tr>
<td>Decisions and Dollars: The New Financial Records and Management Information Curriculum</td>
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<tr>
<td>April</td>
<td>January 1, 1994</td>
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<tr>
<td>Land Laboratorios</td>
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<tr>
<td>May</td>
<td>February 1, 1994</td>
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<tr>
<td>Team Up with CES</td>
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<tr>
<td>June</td>
<td>March 1, 1994</td>
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<td>Supporting Professional Diversity</td>
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<tr>
<td>July</td>
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<tr>
<td>Innovative Curricula</td>
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<td>August</td>
<td>May 1, 1994</td>
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<tr>
<td>Instructional Technology</td>
<td></td>
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<tr>
<td>September</td>
<td>June 1, 1994</td>
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<tr>
<td>Experiential Learning</td>
<td></td>
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<tr>
<td>October</td>
<td>July 1, 1994</td>
</tr>
<tr>
<td>Junior High and Middle School Programs</td>
<td></td>
</tr>
<tr>
<td>November</td>
<td>August 1, 1994</td>
</tr>
<tr>
<td>Research Findings: Using What We Know to Improve Teaching and Learning</td>
<td></td>
</tr>
<tr>
<td>December</td>
<td>September 1, 1994</td>
</tr>
<tr>
<td>Environmental Education Programs</td>
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