THEME
SOEP: Mechanics
SOE In Mechanics — Now Is The Time

The new school year is upon us. Curriculum planning is completed, the calendar of dates and activities is nearly filled, enrollment is firm and you and the students are enthusiastic. If you have been following this year’s theme of articles in this professional magazine, you will recognize this as the ninth issue devoted to SOE. SOE in Mechanics is treated in both a philosophical and practical manner by the authors who have written for this issue. Their insights and suggested approaches to making the supervised occupational experience program a viable instructional tool warrants your attention. The timeliness of the ideas presented not only lend themselves to immediate use for this year’s application but provides direction for long-term planning for the total program of vocational agriculture.

Are the intended purposes and outcomes for SOE in mechanics any different than any other type of SOE? Hardly! Possibility the most unique outcome from work experience instruction in agricultural mechanics which results from SOE placement in a well-managed mechanics oriented work center is the change in attitude and interest of the student.

Perhaps for the first time the student understands what school is all about and how personal qualities and knowledge of the applied science of agriculture can be utilized in a productive and challenging business. Perhaps he or she also has a new awareness of the competencies that are real, in fact, required to progress in a related occupation and the aptitude and amount of real work required to make the business succeed. Perhaps for the first time the student may understand the true meaning of entrepreneurship and the potential it holds for him or her. Last, but certainly not least, a well conducted SOE in Mechanics work experience adds that dimension of “work experience” so often required for entry level employment. How many students do you know who have “tried out”, at a work center following a successful SOE, or been offered employment in a similar position? I trust that the opportunity has presented itself many times!

The Cover

Placement in agricultural mechanics provides opportunities to learn from people who work in the business and apply equipment. (Photograph courtesy of Glen Shinn, Mississippi State University.)

must be mastered prior to project construction. Students are required to develop a working drawing of their project before any construction takes place. This drawing enables the student to build the project in an organized and systematic manner.

At Hill City High School, the agricultural mechanics program is a vital link in the student’s SOE. The students select shop projects that directly relate to their SOE and whenever possible. For instance, a student with a beef calf program might construct a gate or panel as a freshman. Projects for the following years should be a loading chute, stock trailer, and a squeeze chute.

A student with a crop production program might build a hopper for a grain auger the first year. This could be followed with a header trailer for the combine, a grain cart, and overhauling a tractor engine. A senior student might also have time to hard surface a set of drill points for a hoe drill. Project idea books have various ideas to help students discover their needs.

Non-farm students with a work experience program have the same opportunities as a student with a production program in our community. These students easily find employment on farms because of the training which they have received while working on our chapter farms. It is common for my students to be building something for their employer in the school shop.

FFA chapters and civic organizations are also a good source of projects for town students. Our chapter owns a squeeze chute. This was built by a non-farm student. It is leased out to members and other cattle producers in the area. We have also built brush control equipment and rebuilt trash containers for the Chamber of Commerce.

Lawn care services are also a popular SOE for town students. These innovative individuals usually construct trailers to haul equipment and repair engines on mowers, tillers, and snow blowers. In addition to project construction and repair, they are also involved with servicing the equipment. This type of program is an excellent learning experience and makes recordkeeping meaningful.

A swine finishing unit, owned by the FFA has two self feeders and a water trough mounted on the outside of the pen. This unit was built by a student living in town. He also managed the unit for two years. His interest in swine production led him into partnership with a farm student. They finished out two groups of pigs while attending high school.

Using The School Farm

Our chapter farm is also a major source of agricultural mechanics experience for the students. They adjust, repair, or rebuild the equipment depending upon the need. Most of the chapter equipment is purchased used, and we do the majority of our own repair work. Often quite, breakdowns occur in the field and require on-the-spot repairs or adjustments.

Besides providing learning by doing experiences, the students can also see the effects of improper adjustments or worn parts. An example of this occurred last fall when wheat was planted with a hoe drill that had worn points. Naturally, we had a poor stand in some rows because the seed could not be planted deep enough to germinate. Our next step was to purchase new drill points and hard surface them. Other repairs and adjustments we have made for our equipment have worked very well.

Over the years, we have completely overhauled four different tractor engines. We have also built mounts and brackets for the anhydrous ammonia tank and attachments, and reconstructed a hitch for a planter.

Anyone entering the business of farming today must be able to utilize older used equipment. Adapting used machinery for some of the modern techniques sometimes involves making major changes in the construction of the equipment. Some of my students have done this type of reconstruction for their family farm or an employer. Any experience along this line is definitely a help to young farmers today. Occasionally, new equipment is purchased unassembled so students may have the experience of putting it together. This is also a financial savings for our FFA chapter.

Another important aspect of mechanics is servicing equipment. With the high cost of farm machinery today, farmers need to give their equipment proper care in order to get the best return from it. 

THEME

SOE In Mechanics For Production Agriculture

Supervised Occupational Experience Programs are a great way to provide students with Successful Opportunities in Education. As a teacher of vocational agriculture, I strive to provide these successful opportunities for my students. This is done by helping the students set achievable goals in order to obtain a positive self-esteem and develop pride in their work.

In a production agriculture program, the student’s SOE should be the root of the agricultural mechanics program. Since all aspects of the vocational agriculture program are inter-related, this can be done by blending the SOE into the classroom, agricultural mechanics laboratory, record-keeping, and FFA. In this way, the studies and classroom become motivating factors for students to see a direct benefit to themselves through their SOE.

THEME

SOE Related Projects

Safe and proper use of equipment are taught before any laboratory work takes place. Once these are understood, skills are demonstrated and practiced. All necessary skills

THE AGRICULTURAL EDUCATION MAGAZINE
SOEP In Mechanics for Production Agriculture

(Continued from page 5)

Block Classes

In order to teach students other skills necessary to complement their SOEP program, block classes are taught. These classes are an indepth study in areas such as electrical wiring, landscaping, surveying, concrete, tractor and machinery operation, and farm shop tools and equipment. The possibilities with these nine-week block classes are endless. My topic areas are changed occasionally to fit the needs of my students’ SOEP programs.

These skills are beneficial to students in the following ways:

Wiring: Any electrical wiring on the farm or in the home can be handled by these students. One of my crop production students did all the wiring for a grain hauling system.

Landscaping: This class consists of actual planting and care of trees, shrubs, and lawns. Trimming and pruning techniques are useful for students with lawn service programs. Other students find this class helpful when planning windbreaks for their cattle as well as farm beautification.

Surveying: Proper use of these instruments is helpful to a student building a fence line, feeding, or laying out a fence on newly acquired property.

Concrete: Students have found this class useful for all types of concrete work. It has been beneficial to students building slabs around automatic watering systems and floors for grain bins.

Tractor & Machinery Operation: The safe and proper way to use and handle farm machinery is taught to beginners.

Farm Shop Equipment & Tools: This class prepares students to set up or organize a farm shop.

Recordkeeping is just as necessary in agricultural mechanics as it is in crop or cattle production. Our Kansas record books have a section to record service of farm equipment. I emphasize to my students the importance of keeping these records for the best service from the equipment and in case of premature breakdown. When the servicing dates and mileage or hours are recorded in the record book, a person can easily determine maintenance time. Since the majority of these activities are conducted outside the school day, students learn to keep these records on their own. Hopefully, this practice will continue as the student acquires more equipment and becomes established.

Using the FFA

The FFA organization provides proficiency awards for outstanding SOEP. These awards provide motivation for students to expand and apply mechanics activities to their programs. Some of the proficiency awards relating to mechanics include the agricultural electrification and the agricultural mechanics areas. The publicity and cash the individual receives through winning these awards serves as an incentive to set high goals.

Our FFA chapter holds a member-parent open house and banquet each spring. During the open house, parents tour the laboratory, and see the projects of all the students. Quite often parents will see something under construction that would also work for their child’s SOEP. The printed banquet program includes a section on agricultural mechanics. During the banquet program, we show slides of the award winner’s SOEP. The narration and slides point out the application of these projects to the student’s SOEP.

Our chapter also conducts SOEP tours. These tours are beneficial to new members. They get ideas and see what others have built and how they are using it. Pride of ownership is evident in the older students, and they relate experiences of using their built experiences of farm equipment. Sometimes they explain how their projects could be improved or made more useful to them.

Fairs that conduct agricultural mechanics exhibits for FFA chapters provide an incentive for quality work. To have their project chosen to be a part of the chapter display, they are an honor for my students. These displays also require a written explanation of the project which includes how the project will be used. Besides ribbons, trophies, plaques, and monetary awards, students receive praise and compliments on their projects displayed at fairs. Ideas are also born through viewing what other chapters have built. Another advantage is that judges offer critiques on the projects and this makes students aware of the importance of safe design, efficient utilization of materials, and quality workmanship.

The Future

As we look to the future in our agricultural mechanics programs, we are sure to find endless application of the computer. This will also have an effect on the SOEP. Students today are being exposed to computers and need to continue to acquire all possible knowledge about them. Monitors and controllers have already found their way into combines, planters, sprayers, and tractors. Using many of these devices is like using a calculator. Future controllers and monitors will be highly sophisticated and some will require programming by the user. A person familiar with calculators, video games, and personal computers will have little trouble programming a computer or monitor. However, servicing, repair, and perhaps installation will require a deeper knowledge of the device. Teachers are also faced with a new challenge. They must prepare themselves with knowledge and abilities to meet the high technology needs of their student’s SOEP.

As a vocational teacher, I am pleased with any success my students achieve. However, I feel a great deal of satisfaction when I see former students using their vocational skills as a young farmer. Successful farming practices or operations as well as homemade equipment means that my former students are putting their vocational agricultural knowledge to good use. Often this homemade equipment is built at a financial savings and is an improvement over the commercial product. When former students display an ability to use their skills on their own, I realize that my goals have been reached.

The Successful Opportunities in Education a student receives through a SOEP program are impossible to list.

THEME

SOE In Mechanics For Horticulture

After a couple of years of teaching Horticulture with a Bachelor of Science Degree in Agriculture with a horticulture major, I decided I did not like the idea of a temporary certificate and went back to school to work on my Master’s in Agricultural Education. There were several stumbling blocks, but I was prepared for most of them. However, when my advisor told me I had to take a course in Agricultural Mechanics, I almost flipped. I complained to the Professor who was teaching the course that I could not see why I had to take a course in Mechanics. After all, I had no intention of ever teaching a shop course. The Professor then very patiently explained to me the importance of agricultural mechanics in horticulture. Well, I still would not feel comfortable teaching a shop course, but I have since discovered how important mechanics is in the horticulture field.

Needed Competencies

Members of our horticulture advisory committee feel that a student should have a good background in mechanics to be employable in the horticulture field today. The four major areas of horticulture that we deal with are: florist, nursery/landscaping, turf and lawn care management, and greenhouse grower.

The owner of a local greenhouse range and chairman of our horticulture advisory committee has always been especially vocal about the mechanical training our students should receive. A first priority for him would be welding.

September, 1984

(Continued on page 8)
SOE In Mechanics for Horticulture

(Continued from page 7)

Most growers build their own greenhouses when they start out or have additions. Knowing how to do your own con- struction saves a considerable amount of money. Aside from the original construction, there are many other me- chanical devices that an employee must know how to operate and repair. An important piece of equipment in any greenhouse is the propagation bench. The mist system is essential to keep a steady supply of rooted cuttings. Not only is a solenoid valve required for the operation, but also an on/off time clock to turn the mist system on in the morning and off again in the evening and an intermittent program repeating timer to turn the mist off and on at pre- set intervals.

Individual attention must be given to each student prior to placement in an SOE.

Servicing the small engines and maintaining the rotary lawn mower are essential skills to be included in specialized horticulture curriculum.

The purpose of the Farm Implement Mechanics program at Northeast Iowa Technical Institute (NIIT) is to train students for employment in farm equipment dealerships or farm equipment service centers on large farms. Our placement records show a 95% ratio of student completers returning to the farm or seeking employment in dealerships. The SOE program is one of the strong points of the curriculum for all completers. A very high percentage of our graduates who seek employment in dealerships return to their SOE stations to work full-time.

Curriculum Content

The course of instruction identifies a total of 112 quarter credits and 2620 contacts for completion. Students enrolled in the program can complete the requirements in seven quarters or 21 months. Supervised Occupational Experiences are scheduled for the second six weeks of the third quarter and for the first six weeks of the fifth quarter for a

total of 480 hours or 12 per cent of the total graduation re- quirements. The first SOE coincides with spring planting season of Northeast Iowa; the second or fall experience is planned for the beginning of harvest season. During these times, dealerships are very busy and there is a good de- mand for student placement and work experience.

Florists:

For the student placed in a florist shop, mechanics is not as prevalent, at least for larger pieces of equipment. Simple things such as scissors, knives, etc. need to be sharp and in good working order so that workers may efficiently and effectively carry out their work. A pic machine, another basic florist tool, must be in good repair. Malfunction can be costly in terms as well as time. Glue guns are an irreplace- able tool to most florists and can be frustrating (and pain- ful) if they are not operating properly. New guns have come on the market that, while more expensive, do not have the drop of hot glue problems that the old ones did.

While a major repair of a florist cooler is best left for a professional refrigeration repairperson, the average florist needs enough knowledge to be a general repair person. There is no greater disaster that can befall a florist, especially before a major holiday, than for a cooler to break down. Repair people are not always available, espe- cially at night or on weekends and fragile, perishable flowers can not wait long without refrigeration.

Every florist class would have some mechanics in- cluded in their curriculum if we are to train our students to be not only employable, but competitive in their employ- ment.

THEME

SOE In Mechanics for The
Technical Institute Program

BY DEAN L. BYERLY
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SEPTEMBER, 1984
Pre-Occupational Preparation for Mechanized Agriculture

By David A. McCarthy

The Agricultural Education Magazine

Over the past several years, supervised occupational experience programs have played a crucial role in preparing mechanized agriculture students for a variety of careers. This program has provided and continues to provide students with direct learning experiences in the performance of skills associated with their future mechanized agricultural occupations. Instructors in these programs are faced with many challenges, however, as they deal with diverse student abilities, interests, future career goals, and backgrounds. Besides realizing that the classroom and laboratory cannot simulate the real world situation, instructors are also faced with economic constraints, time constraints, and numerous lecture and laboratory preparation.

The challenge that persists is somewhat perplexing: How can mechanized agriculture instructors provide beneficial learning experiences in their respective educational institutions under such constraints?

Pre-Occupational Preparation

At the University of Minnesota Technical College, Waseca, the supervised occupational experience program for mechanized agriculture students is provided in three training formats:

1. Hands-on laboratory training as an integral part of the student's technical college curricula;
2. Directed study credit in one of the technical college laboratories;

September 1984

(Continued on page 12)
Pre-Occupational Preparation for Mechanized Agriculture

(Continued from page 11)

In a related agricultural business, industry, or on a highly mechanized farm. This POP format enables students to receive on-the-job supervised occupational training and twelve college credits under the direct supervision of persons not directly associated with the college. The specific objectives of this cooperative program are:

1. to enable students to learn more about the occupations of their choice through work experience;
2. to allow students to experiment with occupational goals early enough to enable them to alter these without losing valuable educational time;
3. to encourage students to assume a more mature attitude toward their academic preparation;
4. to assist students in recognizing the need for classroom instruction as it relates to their occupational goals;
5. to permit students to work in actual situations that cannot be duplicated in the classroom;
6. to give students the experience of working with equipment which, because of size or content, is not available at the college;
7. to enable students to acquire experiences gained through actual customer and employee relationships;
8. to allow students the opportunity to develop a sense of responsibility required in the business world;
9. to help students understand that through real experience, the value of personal qualities such as neatness, politeness, courtesy, and concern for the clientele with whom they are working;
10. to provide students with the experience related to the process of seeking employment;
11. to provide the college with valuable information about the industry, establish contacts, and obtain advice from business leaders in areas of curriculum, laboratory planning, student recruitment, and placement; and
12. to help develop industry support for the technical college through industry's participation in the program.

Planning

During one of the first quarters on campus, students are exposed to the Pre-Occupational Preparation program by means of a mandatory orientation course. During this course, students are requested to discuss this program with their instructor/counselor and other mechanized agriculture staff. Informational forms are completed, backgrounds and abilities are discussed, career goals are tentatively established, and decisions regarding the time for their internship are discussed in detail.

Approximately one quarter prior to the internship, these students meet once again with their instructor/counselor. At this meeting, it is vitally important that the specific learning goals and objectives be established for their internships. This process forces students to identify the specific skills to be learned during the twelve-week program. When completed, the goals and objectives from this program are attached to the job application form. Both forms are then mailed to prospective POP employers for review prior to the interview process.

After the completion of the interview and initial student placement, the goals and objectives further aid in identifying the more specific role of the employer. The objectives serve as the primary guide outlining the specific duties of the employer who is actually serving in the capacity of an associate instructor.

Supervision

Faculty visitation is essential to ensure the success of the internship. In recognition of this fact, the POP coordinator or the instructor/counselor is required to visit the student on-site at least once, and preferably twice, during the internship.

There are actually several purposes and related benefits for these on-the-job supervising visits. The student and employer individually discuss personal concerns which relate to the student's success. Concerns should be openly discussed to prevent possible conflict between the student and the employer or co-workers. Secondly, the objectives should be reviewed to ensure that the student's goals are being addressed.

On-site visitations enable the POP coordinator and the instructor/counselor to broaden their knowledge in various areas of mechanized agriculture. Instructors keep a closer eye on the development of the students, with the goal of insuring that they learn skills that will be used in their future careers. In this way, they can better prepare students for their respective careers. Finally, successful business contacts may establish further use of POP employers into roles such as guest speakers and advisory committee members.

Evaluation

Students are required to write three monthly reports while working in the internship. The first report requests information concerning the business or industry in which they are working. Students are required to provide an overview of the business structure, the size of the business, the products and services provided, the trade area serviced and the hours the business is open to customers. The second report, required during the second month of the internship, is to discuss the goals and objectives they have achieved and their self-evaluation of the program. The third and final report, required at the end of the internship, requests that the student determine the success of his/her occupational goals. The report should include a description of the position, the responsibilities, the skills learned, the personal development, and a summary of the overall experience.

The Pre-Occupational Preparation program at the University of Minnesota, Waseca, is extremely successful. As a cooperative educational program, POP provides a means of obtaining supervised occupational experience in a realistic environment. Industry support, administrative support, and strong faculty involvement are necessary and vital to the program's success. The methods and procedures used in the program not only benefit students, but also faculty, the educational institution, and the mechanized sector of the agricultural community.

THEME

Occupational Experience . . . A Catch 22?

By Glen C. Shinn

(Continued from page 22)

Remember last May when your graduates were looking for jobs? Unemployment for their age group was 19.4 percent and several employers were still not sure they were going to hire anyone through the economic crunch with this threat! Every classified advertisement in Implements & Trac- tors and Farm Building News specified experience as a prerequisite. Your students may have felt victimized because they could not get a job without experience and they could not get experience without a job.

After meeting with the vocational agriculture advisory committee, you may not have felt so good either. While helping to determine what should be taught, they identified service tasks which required specialized training, tools, and equipment. They also suggested service skills be taught using same model equipment which will be hard to bring into the laboratory. It is almost frightening to think about using a $50,000 lawn planter or a $60,000 combine, even as a demonstrator!

Problems such as these are easier to manage if you insist on an experienced and qualified occupational experience (SOE) program. By working after school hours, Saturday mornings and during the summer, students can accumulate 2,480 hours of bona fide experience while enrolled in a specialized vocational agriculture program. That is the equivalent of a solid year of work experience, plus the two years is not bad!

The dealers who agree to provide supervised work experience learn a lot, too! They are willing to help identify tasks which can best be taught on-site along with an experienced technician. By articulating the school-based instruction with industry-based experience, you can not only do a better job but may do it easier. When you review the original legislation which created vocational agriculture, it calls for a program which "shall be to foster useful employment, toward the end that shall be so designed as to meet the needs of persons who are preparing for trade or industrial pursuits or who have entered upon the work of a trade or industrial pursuits;" (Public Law 347, 1917). This purpose is woven throughout all existing vocational legislation. If experience is necessary for employment, then SOE is a necessary part of a total program!

Designing A Total Program

The first question to ask is "What are the purposes of the program?" If our program is congruent with the legislative charge, then employment is a primary outcome. Employment, however, depends on more than technical skills. Employment is contingent on individual integrity and the ability to work with both supervisors and peers.

(Continued on page 25)
Occupational Experience . . . A Catch 22?

(Continued from page 22)

The second question deals with "What activities may be used to accomplish the program's purposes?" A complete program must include well-planned classroom and laboratory instruction, structured experience in dealing with real-world situations, and the individual and group leadership skills needed to become an effective employee and productive citizen.

Several studies have identified competencies necessary for career success. McClay, et al. (1978) conducted a national study identifying which skills are necessary in agriculture/business. Jacobs (1972) identified competencies needed by teachers of agricultural mechanization in the Western United States. Crabill (1981) conducted a case study of John Deere dealerships in Northeast Mississippi to determine the nature and frequency of service jobs performed throughout the year. Perhaps the best information comes from the replication of appropriate studies in your community. The survey instruments are readily available and it is a good way to get to know the perceived needs of your consumers. Most people feel complimented when they have an opportunity to express their opinions.

How can you structure them into a well-planned course of study, once these competencies are identified for your program? Begin by identifying competencies which have broad application throughout the agricultural industry. These should be included during the first two years of "Basic Ag I & II." An example is "Servicing the Air Cleaner Element." Regardless of the job title, most everyone employed in agriculture uses engines to help perform their work.

The second level of competencies should be structured into a career cluster. Students with career objectives in agricultural mechanics and who are enrolled in a specialized secondary program should focus on the high priority competencies identified by the advisory committee. "Making hydraulic hose" and "Checking alternator output" are tasks which are important if the student plans to work in a tractor dealership. Often a lesson on general principles, as types of thread used for hydraulics or series/parallel circuits must precede the mastery of the competencies.

Third level competencies such as "Recognition John Deere's 15-speed transmission" or "Testing Ford's dual-power hydraulic priority control valve" are machine specific and should be scheduled for specialized post-secondary programs. These three competency levels should be articulated in the secondary, post-secondary and industry training programs.

The Summer Sub-Component

It seems there is never time to do all of the important things during the regular school year. And didn't it rain last spring when someone asked, "What are you doing when school is out?" Too, every time you turn around either your administrator, school board, or some other expert is trying to cut the program back to ten months. A year-round program is much easier to justify when the summer is used to teach critical skills to students.

Crabill identified the season of the year when service jobs were performed in tractor dealerships. Using these findings, May through August was an active time for farm and industrial equipment dealers. During this four month period, 48 percent of the hydraulics, 43 percent of the electrical, and 41 percent of the power train service jobs were performed. With a good deal of planning and some lead instruction, this could be the perfect learning experience for students in agricultural power and machinery.

Most dealerships have excellent training material like Ford's Trac-Com and Deere's Pathfinder programs. Taken to the limit, the instructor could schedule time for weekly individual or small group instruction. Too, a few minutes each week in consultation with the supervisor would allow the students, planning, and remedial instruction for the student.

In nature, the strongest structure is the triangle. In education, a triad composed of the student, teacher and employer would strengthen our program.

Summary

Successful programs recognize student needs. If classified advertisements are any gauge, employers value experience. In the past, vocational agriculture programs banked on the home farm experiences of the student. When linked with state-of-the-art technical information, plus individual and small group leadership skills; the students and programs were a SUCCESS!

Today, we still provide technical and leadership skills but the majority of students do not come to the program with a solid background experience. To maintain our success record, programs must be structured to provide real-world experiences.

Successful programs also recognize community needs. Ask any employer for a quick profile of an ideal employee and you will likely get five characteristics: honesty, dependability, reliability, sobriety, and the willingness to do a day's work for a day's pay! At first, the list looks impossible . . . until you realize that these are not inputs. They are outcomes. They result from well-planned classroom and laboratory instruction, realistic personal goal setting, individual leadership skills, and real-world experiences and expectations.

Successful programs also recognize the necessity for students to continue to grow. Mr. Leon R. Brodeur, President and Chief Operating Officer of Firestone Tire and Rubber Company recognizes the need. Through his efforts, twenty scholarships will be made available to secondary students who participate in the FFA Agricultural Mechanics Contest winners. Winners will be selected based on content, SOE programs, academic achievement, leadership, and community service. The scholarships may be used for post secondary education, if necessary for success in tomorrow's technical world!

References


One viable method to measure student achievement outside the classroom may be a SOEP developed to build an inventory of skills common to a particular job: a SOEP designed to be an extension of classroom/labatory instruction but completed outside class time to reinforce concepts previously learned. Classroom/labatory instruction may address agricultural mechanics in a more general nature while the SOEP may focus on specifics.

The question then becomes: what are the basic skills needed in agricultural mechanics occupations? How do we know what competencies a student should possess after completing the program? The 1978 NATIONAI AG OCCUPATIONAL COMPETENCY STUDY identified and validated competencies needed for entry and advancement in major agricultural and agribusiness occupations. There are eight occupations listed under the agricultural mechanics occupation cluster. The results and importance of this study are well documented, but how often do we actually use the competencies outlined in this and other studies to build a SOEP based on reliable data?

Designing the SOEP
When a student enters a specialized program, an individual SOEP should be outlined which will best complement future job plans. For example, a student enrolled in an Agricultural Power and Machinery class may have a career interest which will require skills related to the occupation of set-up mechanic of farm and industrial equipment. From the competency study, we may identify the skills and the order of importance of each skill related to that occupation. The student's SOEP then may be based on industry needs and job skills congruent to a particular area.

Obviously, great care must be taken in counseling and advising students concerning the selection of a job specific SOEP. The local resources available to aid a student in the completion of a particular type of SOEP must also be considered. Are machinery dealerships available and willing to employ students on a part-time basis during the busy seasons of the year? Such job titles as parts person would require at least part-time employment in a dealership to be practical. Whereas a student with a SOEP directed toward Production Agricultural Mechanic may be able to complete many of the competencies outside of school in the form of directed laboratory experiences or in part-time employment on farm.

After examining the various job descriptions and job competencies found in the NATIONAL AG OCCUPATIONS COMPETENCY STUDY, it becomes evident that the incorporation of all the competencies into a SOEP may be impractical if not impossible. The job title "set-up mechanic" involves some 113 competencies. Some of the competencies are simple and would require little time and equipment, while others would be time consuming and require extensive equipment and technical assistance. It may be feasible to select a workable number of competencies which are considered the most important for the actual job description. This task may be somewhat easier than expected because the competencies have been ranked according to order of importance.

Changes in technology which may affect the importance of some of the competencies since the 1978 study need to be considered when planning the SOEP. It would be beneficial to look at recent studies by Shinn, Crabb, and Jacobs which analyze actual jobs performed in machinery dealerships throughout the year. Comparing these and other studies which attempt to evaluate needed job skills may help to develop a SOEP which is based on the perceived importance of the skills and the actual skills needed in frequently recurring jobs. Another major consideration in selecting competencies to be included in a SOEP involves local adaptation. Certain geographic areas of the country may require skills which will be of less value in other localities. These regional differences, of course, should be reflected in an individualized SOEP.

A Point Guide System
Once a list of competencies to be addressed in a SOEP have been selected, a value should be assigned to each. A

(Continued on page 10)
Teaching Safety Through SOEP

Teaching the safe operation of tractors and agricultural equipment is often passed on by a relative or friend who is important. We do not need to be trained in all of the equipment we use in order to be a successful SOEP. An outcome of this instruction may be the issuance of a tractor operator's certificate or other related certification. In addition to the moral responsibility we have as teachers to teach safety, the rise of legal suits for damages due to injury increases the importance of teaching these areas thoroughly.

A half million dollar lawsuit in California, a million dollar suit in Massachusetts, both were against school systems because of student injury. Under certain conditions, teachers may be held liable for their actions in a court of law. Such lawsuits are not common and are generally litigated as something that will never happen to me, but the facts show that they do occur. As vocational agricultural teachers, we have a responsibility to provide for our student's safety in the classroom, library, during field trips and also during their SOEP.

In 1973, Prosner and Allen had this to say, "Effective vocational training can only be given where the training jobs are carried out in the same way, with the same operations, the same tools and the same machines as the operation itself." Guilinger & wrote, "Most vocational agriculture educators believe that supervised occupational experience is the best means of delivering hands-on experience for students. It must be remembered however, that in our early years these kinds of experiences were taught at the school and practiced at home under parent supervision with assistance from the vocational agriculture teacher. Over the years, the vo-ag curriculum has changed so that it now involves greater varieties of students from more diverse family backgrounds. The school is expected to offer more of the skills and competencies for which students are in turn placed in greater legal burden on the vocational agriculture instructors."

Training Programs

In Oregon, the responsibility for training 14 and 15 year old youths rests with the Cooperative Extension Service and the vocational agriculture teachers. These two agencies are the ones designated by statute to sign the approval forms for the issuance of tractor and agricultural equipment operator's licenses. There has been a wide range of programs offered to achieve this training with some counties and school districts not offering any training for certification.

On the other hand, some schools such as Cascade High School of Turner, Oregon, offer a program which is more extensive than that which is required by the Oregon statute. In this school, students are required to take 10 hours of safety instruction in tractor operation and an additional 10 hours of machine operation and another 4 hours specific to the safety for agronomy and the improvement of the training offered statewide, the Oregon State University Cooperative Extension Service and the persons responsible for the training for the vocational agriculture teachers have planned a course of study to introduce the agreed upon reference and support materials to teach an effective unit.

The Oregon State University personnel developed an instructor's supplement to the Hobart Publications "Safe Operation of Agricultural Equipment" manual. This material was selected due to its organization and content but needed some supplementation for explanation of Oregon's statutes. Chapter 1-7 are required for the tractor operator's permit and chapters 2 through 10 are required for the agricultural equipment permit. The supplement includes:

Coming In October . . .
SOEP: Forestry, Conservation and Recreation

THE AGRICULTURAL EDUCATION MAGAZINE

September, 1984
Teaching Safety Through SOEP

(Continued from page 19)

a. an outline of youth jobs which require training.
   b. basic requirements of a certification program in Oregon.
   c. a list of references and audio-visual aids.
   d. example questions (and answers) for the written exam.
   e. example layout of the performance test course.

The supplement and manuals are stocked by the university bulletin service so they are readily accessible to teachers and others.

One-day, six-hour workshops are being conducted throughout the state with representatives from state agencies, insurance companies and others doing in presenting state and regional perspectives. With the introduction of the supplement and workshops, an increased interest in teaching the safety operation of tractors and agricultural equipment is anticipated.

When teaching tractor and agricultural equipment safety, each piece of equipment the student will be using during their SOEP should be included. Not only shall all safety features be pointed out, but proper adjustment should be practiced by the students. A working knowledge of the equipment is important so that in a field situation the student will be able to detect improper operation which could lead to a hazardous condition. The instructor should set a good example. Beekman and Horner stated, "In fact, failure to maintain an atmosphere of safety awareness could cause the instructor to be considered negligent in the legal sense of responsibility."

To protect our students and indeed the instructor, it is worthwhile to take the additional time to not only teach safe operation of tractors and equipment in a general sense but to include the specific items of equipment the students will be using during their SOEP. The level of competence taught should include the thought process that are a part of a safe operators' skills.

BOOK REVIEW


In the third edition of Animal Science and Industry, the author has expanded the areas covered. Five additional chapters have been included, and various other chapters have been revamped. Many of the sections existing from the prior edition have also been augmented. The author has rewritten the third edition served to increase the comprehensiveness of the text.

Essentially, the text is written so that each chapter can be utilized in the order in which it is found in the book, or it can be cited as a supplement in the area that it addresses. Some of those areas covered in this text are importance of animal agriculture to everyday life, food products of animal agriculture, by-products of animal agriculture, marketing, and other economic and business considerations. Production systems addressed include nutrition, behavior, physiology, reproduction, breeding systems, and genetics. The animal species mainly dealt with include swine, dairy cattle, beef cattle, horses and ponies, sheep, and poultry. Some insight is also provided on goats.

The production schemes are covered in a very basic sense. Each area is highlighted, but not delved into extensively. The text provides a good overview of modern animal science and how it relates to the larger scheme of animal industry. It would be very fitting to use in an introductory animal science course either in universities or community colleges.

THE AGRICULTURAL EDUCATION MAGAZINE

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Teaching Appropriate Knowledge and Skills

By ERE R. BAUGHER
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Teaching Appropriate Knowledge and Skills

Agricultural Mechanics is an essential part of vocational agriculture and as such is vitally important to the SOE program. However, the extent to which agricultural mechanics is taught and the kinds of learning activities that take place vary greatly from one state to the next and even from one vocational agriculture program to the next. Most of the time, the agricultural mechanics content taught as a part of a vocational agriculture program is a direct reflection of the philosophy of the instructor. As a result, some programs offer students a great variety of valuable experience in agricultural mechanics. In others, the tunnel effect is prevalent and little is actually taught beyond the basic skills related to hand tools and welding. This results in a "shop" program which leads to project construction as the major activity that takes place in agricultural mechanics.

Project Construction

It is true that designing, working out a bill of materials, and the actual construction of a project is a valuable experience for a student. It does provide him or her with a great deal of personal satisfaction, a sense of accomplishment, in addition, it is highly visible and serves as an outstanding public relations tool in the promotion of vocational agriculture.

While project construction as a part of the SOE program is desirable, we must not lose sight of the many other agricultural mechanics skills that should be taught. Consider the skill possibilities for SOE programs developed around horticulture, forestry, crops, livestock, fruit and/or vegetable production and others. Consider the part that mechanization can and should play in each of the program areas.

Importance

Offering a complete program in agricultural mechanics has never been more important than it is today. With the current economic situation as it is in agriculture, it is certainly to the vocational agriculture student advantage to have as many agricultural mechanics experiences as possible.

The American Society of Agricultural Engineers' (ASAE) Education and Research Committee, "Instruction in Agricultural Mechanics" (A714), has listed six instructional areas in agricultural mechanics. These include Power and Machinery, Structures and Environment, Electric Power and Processing Soil and Water Management, Agricultural Construction and Maintenance and Food Processing. In order to provide the vocational agriculture student with the experiences necessary to adequately support a top-notch SOE program, regardless of the area around which it is developed, he or she needs instruction in these areas as they apply to each program.

From the practical standpoint, there is not any way that all desirable agricultural mechanics skills can be offered to all students. Therefore, the answer is to develop a systematic and be highly selective in choosing the subject matter to be taught. You should consider such criteria as community and student needs, agricultural mechanics priorities, instructor background and abilities, and facilities and equipment available.

As you develop a program in agricultural mechanics, involve your advisory committee in helping make decisions and keep the school administration advised of proposed changes.

When you make changes in an on-going program, it may also call for a change in your personal organization. Look ahead! Lesson plans may need to be developed; you may need to learn a new skill; and tools, equipment or materials may need to be purchased. In most cases, to be most efficient and still get the job done, you must take time to plan and organize your instructional activities. If you do, it will pay dividends many times over.

THEME

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Skills beyond those provided in project construction should be taught to students. (Photograph courtesy of Dale Perrett.)
SOE In Agriculture Mechanics: Teacher Education's Responsibility

For more than seven decades SOE programs have been a very effective and meaningful way for vocational agriculture students to develop essential occupational competencies. Teacher education programs have consisted of cow, sow, and plow enterprises in the form of ownership or placement. However, this decade has attracted more students into vocational agriculture which have limited opportunities for traditional SOE programs. Thus, modifications must be made in vocational agriculture programs to meet the needs of the changing clientele.

Since 1930 and before, agricultural mechanics instruction has been one of the primary components of the vocational agriculture program. Skill development activities related to technology changes in agriculture have been the primary focus of agricultural mechanics instruction in most vocational agriculture programs. Because of the rapid advancements in agricultural mechanization and parallel developments in other fields, there is a growing need for better education for those entering today's agricultural industry.

SOE In Agricultural Mechanics

One option for SOE which has not received much attention from vocational agriculture teachers is agricultural mechanics. This type of SOE program offers students to develop skills and abilities through ownership, placement, or directed laboratories using school or community facilities. Furthermore, this type of SOE program is available to most teachers which can be used to provide occupational experiences to students interested in agricultural mechanics. Even though little emphasis has been placed on the development and implementation of SOE programs in agricultural mechanics, numerous opportunities exist.

Why are these types of SOE programs considered foreign to vocational agriculture students and teachers?

Teacher Education's Responsibility

These questions remain unanswered to many vocational agriculture instructors nationwide. When asked to describe a SOE program in agricultural mechanics, one teacher said, "It is difficult to differentiate between a SOE program and an approved project in the agricultural mechanics field." Other teachers commented that, "they didn't understand how to assist a student in planning a SOE program in agricultural mechanics," "their facilities were inappropriate for SOE in agricultural mechanics," "they had little experience conducting SOE in agricultural mechanics utilizing school facilities," "the SOE program in agricultural mechanics is only for non-traditional students enrolled in vocational agriculture." These comments indicate that teacher educators need to provide instruction about alternatives for SOE in agricultural mechanics through preservice and inservice agricultural education programs in addition, teacher educators need to conduct research to evaluate the effectiveness of SOE programs related to agricultural mechanics.

The Preservice Program

The preservice program in agricultural education should include instruction about SOE opportunities for prospective teachers to observe vocational agriculture instructors assisting high school students in developing SOE programs related to agricultural mechanics, and opportunities for prospective teachers to assist high school students in conducting SOE programs related to agricultural mechanics.

Regardless of the type of SOE program conducted by vocational agriculture students, implementation procedures must be identified and written in the supervisory curriculum in agricultural education. Prospective teachers should understand the basic principles underlying SOE. Further, they should realize the importance of teaching a unit of instruction about SOE which will prepare students for occupations related to agricultural mechanics.

Now more than ever, teacher educators should emphasize the development of non-traditional SOE programs. Including early experience programs in the preservice curriculum provides prospective teachers with opportunities to observe vocational agriculture instructors assisting students in developing and conducting SOE programs in agricultural mechanics.

During the student teaching experience, prospective teachers should learn how to implement alternative types of SOE programs in agricultural mechanics. They should consider how to incorporate SOE programs from vocational agriculture students in their student teaching centers. Many vocational agriculture teachers need to be introduced to the concept of SOE in agricultural mechanics. Thus, teacher educators need to observe through supervisory visits that visible experiences related to SOE in agricultural mechanics are being provided to prospective teachers.

The Inservice Program

The national SOE workshops have renewed the emphasis on SOE. The 1984 National SOE Workshop emphasized alternative types of SOE available through directed laboratory programs for students with limited opportunities and special needs. If these types of SOE programs are to be implemented by vocational agriculture instructors, teacher educators need to conduct inservice education programs to acquaint them with implementation procedures. Comments presented in this article reveal that teachers have several misconceptions about SOE programs related to agricultural mechanics.

Alternative methods for SOE programs in agricultural mechanics need to be presented to vocational agriculture teachers. In some states, this has been most effectively accomplished by using model schools. The model schools have a variety of SOE programs related to agricultural mechanics being conducted by vocational agriculture students in the form of ownership, placement, and/or directed laboratories. While most vocational agriculture instructors consider SOE and agricultural mechanics as two separate entities, the model school illustrates how these two entities complement each other in providing occupational education.

Teacher educators need to promote SOE in agricultural mechanics to all vocational agriculture instructors. As agricultural jobs continue to become more service oriented, vocational agriculture students will have opportunities for conducting traditional SOE programs. Thus, the time is ripe for teacher educators to prepare vocational agriculture instructors to serve the needs of vocational agriculture students through non-traditional SOE programs such as agricultural mechanics.

Research Activities

Since 1980, many states have launched research projects to determine the effectiveness of SOE programs. Supervised occupational experience programs must be evaluated on a regular basis through systematic research procedures in order to identify strengths and weaknesses. Systematic research can provide the direction needed by vocational agriculture instructors and teacher educators to improve the effectiveness of SOE programs.

While much research has been conducted to determine the effectiveness of traditional SOE programs, very little has focused on non-traditional SOE programs such as agricultural mechanics. As more vocational agriculture students become involved in non-traditional SOE programs, teacher educators need to be prepared to provide vocational agriculture instructors solutions to problems that arise. This can most effectively be accomplished by disseminating the findings related to non-traditional SOE programs. Thus, teacher educators must remember, if it is to be, it is up to me.

Summary

SOE is an important part of a viable vocational agriculture program especially during times of rapid change. Vocational agriculture instructors must use the resources in their community with imagination and innovativeness in planning SOE programs to meet the needs of students.

SOE programs related to agricultural mechanics can provide students with many occupational choices. However, teacher educators must place more emphasis on promoting these non-traditional SOE programs to prospective teachers enrolled in the preservice curriculum and to vocational agriculture instructors through inservice education. In addition, it is essential that teacher educators conduct research that focuses on the effectiveness of SOE programs related to agricultural mechanics.

References


Stories in Pictures

It's good to have an expert to explain the "how to do it" when the book isn't very clear.

American agricultural industry is highly mechanized. Tomorrow's employee can gain a better understanding of the operation and maintenance of production and processing equipment when the school and industry work together.

People who construct or renovate farm buildings continue to use new tools and equipment to increase productivity and help to make a profit.

Summer provides opportunities for the vocational agriculture teacher to deliver small group instruction while students are on the job.

Sound inservice programs involve teachers, teacher educators, state supervisors, and industry specialists to plan classroom, laboratory and experience-based instructional programs.

Many students can combine production agriculture and agricultural mechanics into an "experience of a lifetime"!

(Photographs courtesy of Glen C. Shinn)