THEME: Using Laboratories
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<td>Instructional Laboratories Maximize Teaching-Learning Efficiency</td>
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<td>Programs of vocational-technical education in agriculture use a variety of facilities for instructional purposes. One of the more prominent facilities is the instructional laboratory. The term laboratory is those which maximize efficiency in the teaching-learning process. Laboratories should be equipped with fixtures, supplies, and other apparatus used in developing agricultural competencies. A variety of laboratories are used in modern instructional programs. In high school programs, the typical laboratory is often known as the “shop.” Further, we need to move away from the use of the term “shop” because it dates our instruction and programs. We need to move toward the term laboratory in conjunction with facilities in which hands-on learning takes place. Also, not every program needs a “shop” as part of its facilities. A few examples of the laboratories which may be needed include the following: bedding plant laboratory, agricultural mechanics laboratory, forestry laboratory, meats laboratory, farm supplies and sales laboratory, and beef cattle laboratory. The kind of laboratory facilities needed depends on the content of the instructional program.</td>
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<td>The nature of an instructional laboratory is dictated by the competencies students need to develop for their agricultural career objectives. In other words, the design of equipment and supplies in a laboratory should be determined by a program’s educational objectives. Far too often, a particular area of instruction is included because the facilities are available. This doesn’t mean that new facilities are needed if a program is to be modern or that new facilities have modern programs. Personal observation will occasionally reveal poor programs in modern facilities and good programs in old facilities. Instructional laboratories should be modified so that they develop relevant skills. The laboratory facilities should be appropriately arranged and maintained. Improved arrangements make instruction more efficient and less demanding on the teacher. Poor laboratory arrangements may contribute to student management problems. For example, locating a laboratory some distance away from the school reduces time efficiency and often makes opportunities for students to misbehave. (Appropriate references should be used in planning laboratories. The December, 1980, issue of TIME Magazine addressed the theme of Facilities.)</td>
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<td>Laboratory Use</td>
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<td>An instructional laboratory is an asset to a vocational-technical agriculture program only if it is properly used. There must be specific instructional objectives every time a laboratory is used. Labradoria is more than places for busy work or to escape the classroom. They are facilities in which professional teachers go about the business of teaching. Competency development in agricultural mechanics is more than students building gun racks, cedar chests, and simple projects brought from home. Carefully planned, substantive projects are excellent vehicles for competency development. Laboratories can be used to teach affective, cognitive, and psychomotor skills. Effectively using a laboratory probably requires more instructional preparation time than classroom instruction. Careful planning is needed to keep educational achievement high. It is suspected that educational efficiency in many of the 2 or 3 hour programs that make heavy use of laboratory facilities is low. A short-term (1 hour) experience of higher quality is better for learning than a longer-term (2-3 hour) experience of lower quality. There are many sources of information on using instructional laboratories.</td>
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### ARTICLES SUBMISSION

Articles and photographs should be submitted to the Editor, Regional Editors, or Special Editions. Items to be considered for publication should be submitted at least 30 days prior to the date of issue intended for the article or photograph. All information that is included in a submission should be typed, double-spaced, and include information about the author. Two copies of articles should be submitted. A more thorough description of your submission to the Editor and any artwork that is submitted.

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### This Issue

The theme for this issue of TIME Magazine is Labs. Many suggestions are presented to help teachers make more efficient use of them. The assistance of the Theme Editor, Dr. Jack Frichard of Oklahoma State University, is greatly appreciated.
Using Learning Laboratories

One of the really unique aspects of teaching vocational agriculture is that the learning setting may take place in any number of locations. Teachers of vocational agriculture have said for years that much of the excitement associated with teaching vocational agriculture comes from the wide variety of learning settings available to the teacher. The setting could easily include the classroom, mechanics laboratory, greenhouse, school farm, local farm, community business, or a student’s home setting, to name a few. Most of these are usually referred to as “learning laboratories.”

There is very little doubt in the minds of those who have taught vocational agriculture that the laboratory is a very effective teaching/learning setting for students of vocational agriculture.

Learning in the laboratory setting is usually related to the development of various skills and abilities which might not be so easily taught, or maybe not taught at all, in the classroom. In vocational agriculture, we have usually thought of the laboratory as the place where information and abilities are applied. The “extra step” available to teachers of vocational agriculture is that there is always the opportunity to apply what is learned. Many believe that this “application phase” of vocational agriculture is one of the real strengths of the program.

It is interesting to note that in recent years the use of laboratories has received increased support from local communities. Laboratories are valued in providing students with practical hands-on experiences in agricultural mechanics, local farming schools, and greenhouses. It is, therefore, gratifying to hear of the support of local entities being channelled into these “learning laboratories.” Such commitments on the part of local people for modern learning facilities indicate several things.

First, there is an awareness on the part of what is called a “vocational agriculture program must encompass. The local people are aware of vocational agriculture and what the program is doing for their young people. The image of vocational agriculture must be strong in order for local people to make such a commitment.

Secondly, there is an awareness in the community of the need for up-to-date facilities, equipment, instruction, and laboratories. These will be used to support instruction capable of preparing our young people for entry into certain fields of production agriculture or agribusiness.

You can be sure of one thing, local people do not make strong commitments for programs which cannot produce desired results. There may be those who question some of the things happening in a number of local communities. For instance, as we drive through some of our smaller communities we see rather poor or average school facilities as a whole. To us, we see a new modern vocational agriculture facility nearby. This situation could very easily be a reflection of the community’s belief in that part of the system that gets results in terms of effective teaching and placement of young people in the community who are both productive in agriculture and good citizens.

Teachers of vocational agriculture in the field say that more and more of their students are coming from non-agriculture and non-farm backgrounds. It is quite easy to see that with these changes in our student population comes a strong challenge for every instructional program to provide as many “hands-on” experiences as possible. Laboratory experiences have always been an important part of every vocational agriculture program. Today, because of the demands placed in the background and experiences of our students, laboratories take on a whole new meaning and importance. For many students laboratory activities provide the first contact with the real, living, growing elements of agriculture.

It has often been said that we as teachers must “start where the students are” — not where they think they should be. Many times the laboratory is that important first step in the learning process. The laboratory is a place where realistic learning activities become lasting experiences and sometimes lead to eventual placement of the student in a life-long agricultural career.

The Vo-Ag Shop As A Laboratory

Agriculture mechanics is an integral part of the instruction in vocational agriculture. Programs in agricultural mechanics vary greatly from one area or state to another, yet most all teachers of these programs have the same goal. This goal is to provide the mechanics activities related to the students’ vocational agriculture objectives.

The vocational agriculture shop or “laboratory” is generally thought of as the place to make practical application of knowledge learned in related areas. Its philosophy of “learning by doing” is certainly applicable to this type of instruction. Students know that they will be doing “hands-on” activities in the shop and are usually motivated to learn the subject being taught.

Evaluation

Evaluating instruction in a laboratory can be a problem for many teachers. In assessing student performance in mechanics programs we are evaluating both the process and the product of the task should be measured. Both product and process assessments have their advantages — a decision must be made regarding which should be used. However, in many situations it will be advantageous to look at both process and product.

For example, in assessing an individual’s skill in gas welding the product can be easily judged. This can be done by looking at a finished weld and testing it for strength. In addition to this type of evaluation it may also be important to look at turning on, lighting, adjusting the torch, cutting or welding techniques, and turning off the oxyacetylene welding outfit. Any safety factors may be involved in a skill, the process assessment should be a part of the total evaluation. By looking at the process, the areas of deficiency will become evident and additional work could be assigned. It is important for some areas to focus both on the process and product measures of performance.

Domains of Learning

Vocational skills are a complex integration of the three domains of learning — cognitive, affective, and psychomotor. Each area interacts with and is complemented by the other two. It is a mistake to assume that proficiency in one area indicates proficiency in the other two. For example, just because a student has a clear and extensive knowledge of masonry does not mean he or she can perform the psychomotor skills of mixing mortar and laying blocks. Conversely, proficiency in these psychomotor skills does not indicate a favorable attitude toward the masonry trade. Nevertheless, a vocational teacher must somehow assess and grade a student’s performance.

The areas of cognitive and psychomotor development tend to lend themselves easily to traditional means of evaluation. Multiple choice, true-false, matching, short answer, and essay questions are all widely used as a means to determine the level of learning in the cognitive domain. Identification, work-sample, check lists, and numerical ratings are useful in determining proficiency in the psychomotor skills. The mere fact that scores can be derived easily is not enough.

The two main areas should be weighed against each other and balanced to the point at which one combining grade can be reached. This is the evaluation problem. Which will be deemed the most important: knowing or doing? The view (Continued on Page 6)
Agricultural Mechanics Instruction

In Agricultural Mechanics I, high school junior students learn basic skills in identification and use of hand tools. Along with this, the students are taught tool sharpening and conditioning. Other skills taught include arc welding, oxyacetylene cutting and welding, braze welding, the use of power tools, and farm plumbing. Safety is heavily emphasized during all areas of agricultural mechanics. Electricity, small engines, concrete, and the use of the farm level are taught in Ag-III. Agricultural mechanics is not taught in all production agriculture or horticulture curriculums.

Agricultural Mechanics II is offered only to senior students who have completed the theory and skill developments in Agricultural Mechanics I. Students apply skills they have already learned as well as develop new ones. This is accomplished through shop project design and construction as well as equipment repair.

Many competencies can be taught and learned through project work. The development of basic mechanical skills must be maintained. Almost all the skills learned in the agriculture shop can be used in most all agricultural fields the student might choose.

Project Construction

Many vocational agriculture teachers may feel that the agriculture mechanics shop is used only for the repairing or building of projects for the students' own supervised agricultural program. This is true when the need for such work is required and should be of first priority. Many of the projects and tools used in agriculture mechanics are designed, constructed, and sold to farmers in our community and surrounding areas.

Agricultural mechanics is one field where evaluation by performance is inherent. The students often have the opportunity to take an order from an area rancher for a particular piece of equipment. Using their design, they build the piece of equipment and sell it to the local farmer.

The construction of projects which are marketed to the public provides a method to educate students and teachers alike as to the marketing and interpersonal relations topics we teach in our program. The marketing of projects has also enabled us to better finance our total vocational agriculture program.

The demand for large hay handling and hay feeding equipment has been so great the past few years that students must work after class hours on a regular basis constructing these projects. These students learn skills that cannot be taught during scheduled class time. Therefore, these students can better perform their work, which is a strong indication of this very vital program.

Students begin to identify themselves as an important part of the program when they successfully complete a project from planning to the finished product. Once this feeling is developed, the students begin to recognize their own worth and value to the program, and more importantly, their place in it.

Project construction requires a lot of planning on the part of the instructor. This is an exciting time for new ideas. It seems that these new ideas usually come about when changes in the supervised occupational experiences on equipment and facilities or when the community demands it.

Ideas Unlimited

The National Vocational Agricultural Teachers Association's Ideas Unlimited Contest, which is sponsored by the National Bankers Association and FFA, is an outstanding opportunity for new ideas. It is especially true with agricultural mechanics project construction. The idea submitted may be original or borrowed. The contestant must tell how it is used and how it will help others by using 500 words or less, with no more than one page of descriptive materials.

In our state, each of the five districts selects a winner with one being recognized as the state winner during our annual convention. The text of the ideas must be typed or written in manuscript form. Regional winners are selected by the national winner being selected from the regional finalists. The regional and national awards are presented at the NVATA Convention in December of each year. Contest rules should be available through the state secretary of the state association.

In summary, agricultural mechanics is an exciting area of vocational agriculture to teach. The construction of projects provides a method to teach skill development. Students will find it easier to enter the world of work if teachers take the time to train them.
Production Agriculture on Two City Blocks

How do you turn two city blocks (approximately 4½ acres) into agricultural production for 76 vocational agriculture students? What determines an agricultural production project of this number of acres in cultivation, the number of head of livestock, or the size of a greenhouse? Consider: production agriculture on two city blocks. The John Marshall High School in Oklahoma City is a community of 410,000 people and in the midst of those people are two city blocks devoted to production agriculture for the John Marshall Future Farmers of America. The 4½ acres are known to the students at John Marshall High School as the “school farm.” The school farm idea is new to most of us. However, this school farm has contributed greatly to students, community, and adults in many different ways.

Use What You Have

How does the John Marshall school farm provide opportunities? A very simple philosophy is followed: “use what you have.” The facility has been available to students in vocational agriculture since the late 1950’s. Only recently has it been expanded and updated to reach more students through a more effective learning environment. The Oklahoma City Public School System recognizes the need for a new facility, designed and built a new “Life Science Laboratory” at the school farm site in 1980. The impact of the facility was anticipated, but not fully realized until after its completion.

The facility was designed to provide as many learning opportunities as possible. The guiding principle was a hands-on approach for those who would be participating in the vo-ag program, and for those who would not. The facility was designed to be accessible to all students, children, and community groups as possible and that Oklahoma City students would be exposed to production agriculture.

The Design

The complex was developed with four primary areas: a classroom area, demonstration area, a containment area for animal growth and development, and a horticulture area.

Classroom Area

The classroom area is an excellent example of the versatility and flexibility of the building. The classroom has all the necessary elements to be classified as a deigned, usable classroom. It also doubles as a wash room for washing animals during cold weather. There are many other activities and group utilization on this classroom area, FFA meetings, community meetings, Kiwanis meetings, legislative dinners, booster club meetings, and recreational activities are all conducted using the classroom facilities. There are some very very special activities which deserve special mention. Each year the members of the Oklahoma League for the Blind are brought to the facility and a program is provided so that the children can touch and feel animals of all kinds. If this opportunity was not made available, these people would have little, if any, chance in Oklahoma City to experience close contact with agricultural animals. Also, each year the Food for America program brings in young children from pre-schools, kindergartens, elementary schools, Bluftools, Brownies, and Cub Scouts from throughout the city to visit the school farm.

Demonstration Area

The demonstration area serves a variety of needs for students who are participating in the vo-ag program. This area is equipped with a set of roll out bleachers which will seat 500 people. Demonstrations involving livestock skills, judging skills and many other areas can be performed by instructors or resource persons with ease. The area is large enough and has access so that large equipment such as tractors or vehicles can be brought in for demonstration purposes. It also doubles as an area where the local stock show is held, and temporary pens can be constructed to contain animals for special events, such as a barnyard and the Oklahoma League for the Blind petting area. Because of the accessibility of the demonstration area, groups or organizations will use the area to conduct special programs. Surrounding the demonstration area are animal containment areas with connecting exercise lots and cattle. The pens are made available to students who wish to involve themselves in animal production such as fattening, showing, marketing, and, to a limited degree, breeding animals. The facility will house approximately 60 head of steer and 200 head of hogs. Twenty-eight students will be able to apply classroom learning in practical situations. Pens are constructed to contain as well as protect animals from the environment and provide injury from dogs in the surrounding community. Additionally, the entire 4½ acre complex is surrounded with a 6 foot chain link fence.

Each pen is designed with automatic watering systems and gives freedom for each animal to roam in and out of the exercise lot. The individual pens for animals allows students to develop positive relationships with their animals and other special considerations for their individual animals which may need special medical treatment or care.

Horticulture Area

The horticulture area is adjacent to the Life Science Laboratory and provides students with an opportunity to grow crops as a production project. The students have this outside growing area and a greenhouse located at the high school. Each student is participating in the plant production program must successfully grow and care for a certain number of plants. Each student is provided with growing space in the greenhouse and a portion of the garden area outside. The outside garden requires each student to plant, fertilize, and care for the plants throughout the summer. A portion of their grade is based upon how well their plants are grown and the amount of care given during the growing season.

If the facilities were not provided, less than 5 percent of the students would have projects other than some type of work experience program.

The Measure of Success

How do you measure the success of this particular urban program? At present the program has two teachers and 76 students enrolled. Thirty of those students have animal production projects while the remaining 46 have horticulture projects. For the first 4 years, the graduates of the program have gone on to major in agriculture in college or work in an agriculture occupation. Ten students are in college training to become vocational agriculture teachers, approximately 70 students are in college majoring in agriculture, and 60 students are employed in agricultural businesses. This is impressive enough, but consider some of the other achievements of the young people in this program: six state farmers, one American Farmer, one Western Region Horse Proiciency Award Winner, one member participating in the WEA Program, a State Vice President-Central District, a State President, a National Treasurer, 9 FFA Chapter Champions of the American Royal and many other awards. The success of any program is directly related to how you “use what you have.”

The John Marshall program in Oklahoma City makes maximum use of learning laboratories — so can you.


The Handbook of Livestock Management Technologies is a comprehensive test of many important aspects of the phase of livestock production. Many new innovations and livestock practices are included in the book with numerous diagram-type illustrations to aid the reader in comprehension of the concepts.

A handbook includes management practices and chapters in livestock re- strain, beef cattle, dairy cattle, swine, horses, sheep, goats and poultry management. An animal health chapter and a detailed appendix with a thorough glossary are also included in the text.

Each of the chapters is designed in a logical order, giving an introduction on each species of livestock. It contains new information such as estrus synchronization, artificial insemination, growth implants, heat detection, and health techniques. The well-known and proven practices in live- stock management are discussed in detail and the book gives step-by-step instructions.

A section that is extremely well done is on abnormal birth presentations, which includes illustrated corrective measures. Another section good reading for any beginning hog farmer is a step-by-step procedure on preparing for farrowing. Included is a detailed listing of equipment and supplies needed and the step by step instructions.

The authors are both professors of animal science at Purdue University. They have developed an excellent tool that would be informative to anyone. The text is well suited in animal production for high school vocational agriculture as well as basic animal science in community colleges and universities and would make a good reference for anyone.

Richard E. Jacobson
Graduate Student
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Fresno, California 93740

Handbook of Livestock Management Technologies

BOOK REVIEW

The Food for America Program at John Marshall allows city youngsters to touch and feed farm animals, often for the first time.
Systematic Approaches to Planning, Organizing, and Using Agricultural Mechanics Laboratories

Agricultural educators recognize that agricultural mechanics is definitely a major part of instruction for all students enrolled in vocational agriculture. After identifying agricultural mechanization instructional units, organization and layout of the mechanics laboratory can proceed. A systematic approach should be followed when planning and organizing a laboratory. A systematic approach helps to arrive at the most efficient laboratory organization and equipment arrangement and to provide instructional efficiency and productivity.

Key Questions
Answers to questions such as the following should be obtained:

- How can an agricultural mechanics laboratory be organized that is efficient for teachers and students to work in and that can be maintained in an orderly manner?
- How can space and equipment be justified?

A Systematic Approach

Usually, it is impractical or impossible to have enough work stations for every student in the laboratory. Therefore, the first step in implementing a systematic program approach is to identify the number, location, and type of work stations needed in the laboratory. These should be based on needs of the students, career choices, and transfer skills.

The second step is to organize the task and process analysis of the skills the students are expected to accomplish at each station. A schedule of rotation of students through the work stations in the various areas to accomplish specific learning objectives is essential. This is a student management skill needed by the instructor. The arrangement of tools, equipment, and materials is important. This may appear very technical, but it is the same type of procedure engineers use to analyze complex industrial units. In a teaching situation, it is as simple as the teacher thinking through the steps and going through tasks that are planned for the student to accomplish.

This familiarizes that teacher with the actual activities that are required for students to complete the assigned tasks. Once each task is broken into steps, the flow of material, tools, and students is obvious. A rotation scheme should be planned to move students through the work stations. Equipment purchases should be made to balance the systematic rotation. The amount of equipment needed in any one area depends on the task time and the number of students that fit into the time schedule.

To determine the number of machines, equipment, and materials needed, an engineer/teacher would time the length of machine-time required for each student. The number of students to complete the task would indicate an ideal student-machine ratio for the most efficient use of time for that task. For project construction and farm machinery repair, the efficient use of material, equipment, and students through the laboratory is an absolute essential.

In the laboratory the instructor assists, instructs, and supervises students. The distance the teacher walks to supervise is also related to the distance students, tools, and materials travel. The travel paths of the teacher must be considered to minimize teacher effort and maximize teaching efficiency. The supervision time of students at work stations and elsewhere must be considered. The learning objective is the essential aspect in student management for skill development. If there is a question concerning the efficiency of a laboratory arrangement, various alternatives should be outlined in order to find better ways of doing things or comparing alternatives. It is often helpful to write out steps, draw flow charts, and measure distances. This prepares the instructor to do another technical engineering process called "work simplification." As with most management techniques, work simplification involves the use of common sense. After work simplification comes economy in motion principles and station organization.

Laboratory Efficiency

In the past, laboratory efficiency has not been studied by agricultural educators. Travel path studies need to be conducted to bring about improvements and make agricultural mechanics laboratories more efficient. Agricultural educators have been slow in making time and motion studies, laboratory work efficiency studies, and adapting procedures that are standard. Laboratory management has not kept pace with productivity improvements. Many vocational agriculture departments are using floor plans, equipment organization ideas, and teaching units that are out of date, even though they are not out of the press. Some teachers are known for running junkyard type, unorganized shop programs.

Until leadership from within arrives with innovative solutions, agricultural educators will continue to be forced to be their own engineers. At least a systematic approach is a defensible, organized procedure for finding answers to laboratory management problems. The organization of learning activities for maximum productivity and efficiency of time and effort is one area where everyone can make improvements in instruction through a systematic approach and improve "learning by doing."

Lesson Plans on Soybeans Now Available

The American Soybean Association (ASA) and BASF Wyandotte Corp. are producing vocational agricultural lesson plans on soybean production, announces Mr. Dan Reewee of ASA.

The lesson plans, which include student work sheets and visual teaching aids, will be available, free of charge, to vocational agriculture instructors in major soybean producing states. The plans have been developed for use in both secondary schools and adult education programs. ASA and BASF recognize that a vocational course specifically geared to the principles of soybean production is beneficial to the health of the whole industry. Production practices are changing so rapidly that we see a need for continually updating agricultural courses to keep students and producers aware of the best and latest techniques available," says Mr. Burghard Elster of BASF.
Learning Laboratories for Prospective Teachers of Vocational Agriculture

The leadership aspect of vocational agriculture programs has been a major selling point for many years. Many school administrators, students, and community leaders, even those with no interest in agriculture, have supported vocational agriculture over the years because of the leadership abilities students receive. A recent study shows that students receive a high level of leadership training. Leadership activities must have a high priority from the local chapter level all the way to the national level.

Teacher and Student Background

One of the key figures in the development of leadership in vocational agriculture is the local vocational agriculture teacher. The quality of leadership activities and training that takes place in a local vocational agriculture program can vary. The leadership background of the local advisor is vital. Many vocational agriculture teachers come from a background of active FFA participation in high school. Their background in, and many times their enthusiasm for, leadership activities and leadership development may depend upon the degree to which leadership was emphasized in high school FFA activities. However, some vocational agriculture teachers do not possess an FFA background.

Regardless of whether vocational agriculture teachers have a background in FFA, they tend to have one thing in common: most have been involved in a teacher education program preparing them to teach vocational agriculture. This period of time can be a crucial period in the leadership development of the prospective vocational agriculture teacher. The teacher is a student spending college time representing a void between active participation in the local FFA chapter and entry into the vocational agriculture teaching profession. Even if students continue to pursue in other local chapters, many times their ties to the FFA may be weakened by being a long distance from home or the lack of time available to devote to the local chapter, due to the demands of college work.

For the prospective teacher without a background in vocational agriculture, the college years may represent a time in which he/she would like to take more interest in what the chapter is doing "back home," but are unable to do so because of the same limitations as the previous mentioned students. The college years clearly represent a void that needs to be filled in the career of the prospective vocational agriculture teacher. For students with an FFA background, it is an opportunity to continue and build upon the leadership training which started in the local chapter. For students with no FFA background, it can be a time for the development of leadership qualities which will be necessary upon entering the teaching profession.

College or University Leadership Experiences

In order for young people who are preparing for careers as vocational agriculture teachers to develop leadership during their college years, there need to be sources of leadership activities available to them. Two main sources for leadership activities are the undergraduate agriculture education courses and the Collegiate FFA. Through these courses, students can be provided with leadership activities which will benefit the students regardless of their leadership background.

Classroom Activities

Pre-service courses in agricultural teacher education can be used to accomplish not only objectives in program planning, supervision, teaching methods, to name a few, but also provide the forum for the development of leadership skills. Two activities which offer excellent leadership opportunities are public speaking and parliamentary procedure. These activities are activities which can benefit students both personally and professionally. The students develop speaking skills and gain an understanding of democratic principles which will be useful to them throughout life, regardless of whether they choose to enter the teaching profession. The benefits are even greater if the student teaches vocational agriculture, since they will aid the students in the classroom.

A teacher who has personally participated in a parliamentary procedure contest or a public speaking contest will have an advantage when the time comes to train students for these contests. This personal experience in a contest situation may help students become a productive teacher's assistant for these types of activities. For these types of activities, the student to promote these types of activities upon entering the teaching profession.

At Oklahoma State University, students are given the opportunity to participate in both the parliamentary pro-
cedure and public speaking contests in their undergraduate agriculture classes. These activities also hold an extra advantage for the students. The contest judges are usually members of the state supervisory staff that the students will be working with when they enter the teaching profession. This allows the students to become familiar with the supervisory personnel prior to entering the teaching profession. Also, the Supervisory staff becomes familiar with the students who will soon be under their supervision.

Departmental Club Activities

Oklahoma State University offer a variety of leadership opportunities for prospective vocational agriculture teachers. Students have the opportunity to gain experience in the field by participating in various club programs. Chapter members also work with high school FFA chapters to create an awareness of the vocational agriculture careers and programs for both students and staff. Chapter members also work with high school FFA chapters to create an awareness of the vocational agriculture careers and programs for both students and staff. These activities include giving speeches to the high school students. These types of activities give the college members an opportunity to use public speaking skills before entering the teaching profession. All high school members also help them to become oriented to working with high school age students.

Collegiate FFA members are also highly involved in working with local agriculture education programs and have leadership opportunities through the FFA activities. This enables the prospective vocational agriculture teacher to become involved in these activities in a manner that is different from the participant role that they may have had while in high school. Members work at the Tulsa State Fair and the State Fair of Oklahoma in Oklahoma City and assist with the livestock show activities. This provides the members with opportunities to see these types of activities from a different viewpoint and also provides a chance to help them increase their understanding of the various FFA activities. This provides the members with opportunities to see these types of activities from a different viewpoint and also provides a chance to help them increase their understanding of the various FFA activities. This provides the members with opportunities to see these types of activities from a different viewpoint and also provides a chance to help them increase their understanding of the various FFA activities.

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Departmental Club Activities

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Collegiate FFA members are also highly involved in working with local agriculture education programs and have leadership opportunities through the FFA activities. This enables the prospective vocational agriculture teacher to become involved in these activities in a manner that is different from the participant role that they may have had while in high school. Members work at the Tulsa State Fair and the State Fair of Oklahoma in Oklahoma City and assist with the livestock show activities. This provides the members with opportunities to see these types of activities from a different viewpoint and also provides a chance to help them increase their understanding of the various FFA activities. This provides the members with opportunities to see these types of activities from a different viewpoint and also provides a chance to help them increase their understanding of the various FFA activities.

The Research Committee of the Agricultural Education Division, AVA, Calls For Papers

This is the CALL FOR PAPERS for a conference to be held in conjunction with the Ninth Annual Agricultural Education Research Conference. The conference will be held on December 3, 1982, in St. Louis, MO, in conjunction with the American Vocational Association convention.

PAPER PROPOSAL SPECIFICATIONS: Seven copies of the paper proposal (not to exceed five pages double spaced) should be submitted for use in determining the final proposal participants. The summary should include:

A. Objectives of the Study
B. Methods
C. Data Sources
D. Results and/or Conclusions
E. Educational or Scientific Importance
F. Name(s) and Mailing Address(es) of the Author(s)

Uses of Land Laboratories

A "land laboratory" is an area operated by a school for making observations, demonstrations, and practices of the processes learned in vocational agriculture. This includes student activities, FFA activities, and projects supervised by teachers in order to provide more in-depth experiences or a wider variety of experiences than other agricultural units offer. The school land laboratory may include the forests, machine storage areas, barns, nurseries, greenhouses, and land for livestock and plant production.

The definition of "land laboratory" also includes the school farm which is primarily used to provide more extensive farming experiences than those found on the land laboratory. While both are educational, the land laboratory provides opportunities for students to gain agricultural proficiency in an educational setting where the emphasis is on a school farm is on farming. Excluded from the definition of the land laboratory is the agricultural mechanics laboratory.

A Florida Study

A study was made in Florida to determine the use made of land laboratories. A total of 102 departments were randomly sampled, with 85 percent responding from middle, junior, senior high, and agricultural school. Characteristics pertaining to the use of land laboratories were examined. The findings were:

- Slightly over half of the respondents stated that they did not have a policy statement and objectives for the land laboratory.
- The teacher was most frequently indicated as the person responsible for establishing instructional policies. This was followed in order by the teacher and advisory committee, the teacher and administration, and teacher and principal.
- Over 70 percent of the land laboratories did not have any type of student-owned projects.

- Of those land laboratories having student-owned projects, slightly over 80 percent indicated that up to 25 percent of the students at their school had projects on the land laboratory.
- About 77 percent of the land laboratories with student-owned projects did not change rent for those projects.
- Beef animals were the most common animals raised on the land laboratory followed by swine, poultry, dairy cattle, and hogs.
- The most common types of plants grown on the land laboratories were vegetables, ornamentals, pasture, agronomic crops, forestry, fruit, and turf.
- As for records kept on the land laboratory, over 80 percent indicated that records were kept. Of those keeping records, the teacher and class were the ones most responsible for it.
- Over 40 percent stated that the teacher was responsible for making the annual management decisions. One-third indicated that both the teacher and students made the decisions.
- As for daily operational decisions, the teacher was seen as being the most responsible for the decisions.
- Approximately 83 percent indicated that teachers received no extra compensation for managing the land laboratory.
- Over two-thirds stated that the teachers had insurance for any persons working or using the land laboratory.
- Groups which used the land laboratory other than the vocational agriculture classes were elementary classes, adult education classes, elementary, junior high, and high school classes, and finally elementary and adult classes. Most land laboratories had only the agriculture classes using the facility.

FFA sources of salaries were listed as the federal government, Neighborhood Youth Corps, the agriculture department, and CETA.

Land Laboratory Purposes

The most important purpose of the land laboratory as indicated by the respondents was to provide experiences to practice competencies learned in class. The second most important purpose was to provide experiences for students to work together cooperatively. To teach agricultural competencies was the third most important purpose. The three least important purposes of the land laboratory as perceived by the teachers were to provide summer employment for students, provide part-time employment for students, and to conduct agricultural demonstrations for the community.

Conclusions as to the use of land laboratories in Florida were that teachers were the principal decision-makers regarding daily management decisions, and establishment of instructional policies regarding the land laboratories. Additionally, the uses made of land laboratories in Florida agriculture and natural resources education programs were varied. It is interesting to note that when Poucher (1952) conducted his study in Florida, he found 90 percent of the departments had operational land laboratories. When this study was conducted in 1978, the percentage had risen to 93 percent. Teachers of vocational agriculture in Florida realize the importance and significance of the school land laboratory.

Fire Up Your Students!

Put some fire into the eyes and minds of your students by using your laboratory to teach how engines operate. A student's eyes will be wide open and a smile will appear from ear to ear when an engine "fires off" after being assembled. If you want this reaction from your students, you must use the right techniques.

Have Engines Available

Small gasoline engines that are in operating condition should be available for each pair of students in the class. A two or three horsepower horizontal shaft engine is an excellent choice for this purpose. It will be easier for you to organize your class instruction if you are teaching with similar model engines and the parts can be removed with little difficulty.

Do not attempt to repair an engine the first time a student disassembles and assembles an engine. Your purpose should be to show the parts and how they operate and how to replace the parts, and to motivate the student when the engine "fires off," without the stress of repairing the engine.

One effective teaching method is to discuss how engines operate and to teach appropriate theory as students disassemble and assemble an engine. For example, what better time exists to teach the principle of the four-stroke cycle engine than when the student has removed the cylinder head allowing the movement of the piston in relation to exhaust and intake valve movement to be seen. Of course, teachers will need to prepare visual aids that can be used at this time instructing the process. My experience indicates that you must also have the visual aids because some students can not easily understand a cut-away drawing. For example, it is essential that you have some small engine flat-type carburetors and visuals of a cut-away carburetor when teaching the theory of carburetion. The teacher should indicate that these physical opportunities to remove the fuel bowl allowing them to observe how the fuel level is maintained, and to observe how the air movement through the carburetor creates low pressure areas that cause the fuel to mix with the air.

Disassembly and Assembly Sheets Needed

Other essential teaching aids include a repair manual for each pair of students and a disassembly and assembly job sheet. Some repair manuals contain an overhaul procedure. If yours do not, you will need to prepare one. The step-by-step procedure should be included in the job sheet, and should correspond with the disassembly and assembly repair manual. It is important that the students be reminded to read carefully and to follow written instructions since this will be expected of them upon employment.

Use of Video Tapes

Again, to light up the eyes of your students, use video equipment. As a teacher, how many times have you said, "Be sure to align the timing mark on the crankshaft gear with the crankshaft gear" and only two of the fifteen students observing could see the mark? The video camera is an excellent aid in magnifying the small engine parts so everyone can see demonstrations.

Five video tapes of the disassembly and assembly procedure of small gasoline engine parts have been filmed by the author. Each tape is approximately twenty minutes long. From these tape students can observe certain related activities and then immediately perform these skills on the engine. If available, it is recommended that you set up two television monitors so the students can progress at their own rate.

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Fire Up Your Students!  
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The use of the video media will also provide you with more time needed to teach on an individual basis. While some students are observing video tapes, you will be able to assist those students who are having difficulty in performing certain skills on their engines. Can you think of a better technique in compensating for the difference in the abilities of students?

Repair an Engine

Now that you have "fixed up" your students they will be ready to bring in an engine from home and, in their words, "fix it." Be sure that you tell them to bring in a repairable engine, not an old junker. It is advisable not to attempt this instructional unit if you do not have adequate knowledge and enough tools, including special tools, equipment, and supplies. You must have available or have access to micrometers, torque wrenches, valve grinding and seating equipment, cylinder hone, and an assortment of pullers. You may also need main bearing and valve guide reamers. If you do not have readily available parts you may wish to stock a small supply. Points and condensers, keys, main bearing seals, gasket sets, standard ring sets, and rope would be some of the items you need.

The important parts of this unit are teaching the students to measure with precision tools, to determine the correct repair procedure, and to perform the specialized skills. As an example, the student must be able to read and use a micrometer to determine the wear on crankshaft journals and the wear within the cylinder. After students have determined the condition of the engine, they will need your advice to make some critical decisions. Will a set of standard rings be adequate? Should the cylinder be honed over size? Should a short block be purchased? Should the engine be scrapped? It is also important to have the student present an estimate of repairs to the owner of the engine because the owner may prefer to purchase a new piece of equipment.

Whatever you do as a teacher, be sure that the students do the repair work thoroughly and correctly. In repairing small engines the question "should I let the student short block the engine" always arises. I don't recommend this method or repair if the existing block can be repaired economically. Remember, the student loses the opportunity to learn numerous skills if you decide to use a short block.

Clean Engine Thoroughly

Based on my experience, it is very important during the repair procedure to thoroughly wash the engine block with hot water and soap after any machine work has been performed. Valve seating, reaming valve guides, and honing cylinders will leave metal particles that will destroy an excellent repair job when the engine is started. Be positive that all aluminum particles are removed from the cylinder and crankcase after you have honed a cylinder. The honing oil mixed with the aluminum particles will adhere to any surface so be especially careful in inspecting the various crevices in the block for contamination. If metal particles are left in the engine block, they will be mixed with the oil when the engine is started and ring failure will occur immediately. Remember, if you wipe the cylinder and crankcase with a white cloth and observe any indication of contamination, wash the block again.

Engine Stand and Flywheel

You may wish to fabricate a metal stand for the vertical shaft engines and machine a heavy flywheel welded to a hub which will act as a flywheel in place of the mower blade. A vertical shaft engine attached to a stand will not run properly without a heavy flywheel. Of course, you can have the students bring the mower deck to the laboratory and attach an engine to the deck before attempting to start the engine. Don't forget to check the maximum and minimum RPM's according to specifications.

A Rewarding Experience

To develop pride among your students, paint the engines and install new decals. Won't mom and dad be proud when their son or daughter brings home that old engine that was sitting in the barn all winter and will start next time they pull the rope? Teaching in the laboratory is enjoyable and rewarding!

1983 Themes

The Agricultural Education Magazine

January
Achieving Quality Classroom Instruction
February
Achieving Quality Relationships with Business Industry
March
Achieving Quality Supervised Occupational Experience Programs
April
Achieving Quality Programs with Decreasing Resources
May
Achieving Quality Summer Programs
June
Achieving Quality Program Supervision
July
Achieving Quality Teacher Education Programs
August
Achieving Quality Program Financial Needs
September
Achieving Quality Laboratory Projects
October
Achieving Quality Organizational Goals
November
How Others Perceive Us
December
Assessing Student Performance

The training of future vocational agriculture teachers is one of the most important technical agriculture and reality in the teaching activities used in the instructional programs. The present trend of large numbers of college students entering agricultural education without having the benefits of high school level vocational agriculture makes the utilization of local vocational agriculture activities more essential to the development of these prospective teachers of agriculture. The use of local vocational agriculture programs as a tool for agricultural education majors and high school vocational agriculture programs.

Activities Involving Local Vo Ag Programs

The activities using local vocational agriculture programs as a tool for agricultural education majors and high school vocational agriculture programs.

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Local Vo-Ag Programs Are Laboratories in Training New Teachers

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Benefits to the High School Vocational Agriculture Students

High school vocational agriculture students benefit from observing an agricultural education major not much older than themselves who is striving to develop a career. The interaction between these two groups can lead to a better understanding of the vocational agriculture teacher and the students. Having an agriculture education student in class provides the high school students with another real career option — the option being to get an education and become a vocational agriculture teacher.

Other Benefits

The local vocational agriculture program gains the experiences of the prospective teacher. For example, the local agriculture teacher may have little or no experience in poultry judging. The prospective student teacher may take on responsibility of teaching a poultry judging team. In another situation, the prospective teacher is also learning in the mechanics laboratory which would allow him to have the opportunity to continue regular classroom or shop activities. Or the vocational agriculture teacher may simply desire to do a better job, realizing there is someone observing their every move as a teacher of agriculture.

Conclusions

Vocational agriculture teachers should be commended for their support as demonstrated through their cooperation in allowing agricultural education majors to get actively involved in the vocational agriculture program and in the many FFA activities at the local, sectional, district, and state levels. The backbone of a sound agricultural education program depends on having a large degree on the experiences and support local vocational agriculture teachers are willing to provide vocational agriculture majors in preparation for the professional student teacher a semester or two prior to graduation.

What Unique Qualities Do Women Bring to Mechanics Classes

We suggest that women may approach teaching automotive mechanics skills a little differently than do their male counterparts. First of all, they probably are more familiar with different mechanical problems. Women generally experience repair problems in their personal vehicles which might develop in different situations. Second, women might have a different approach to customer service and better interpersonal skills which would benefit mechanics classes. However, women might not have as much experience in the field of automotive technology, which might require them to be more patient and more interested in the students’ learning process. 

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THE AGRICULTURAL EDUCATION MAGAZINE
Stories in Pictures

An exhibit entitled "Milestones of Progress" in the FFA National Hall of Achievement located at the National FFA Center in Alexandria, VA, has been completed and is open to the public.

Two exhibits located at the National Hall of Achievement at the National FFA Center in Alexandria, VA. The Hall has been completed and is now open to the public. The exhibit in the foreground is entitled "Learning to Do, Doing to Learn" and the other is "The Success Story of American Agriculture." (Photographs courtesy of the National FFA Center)