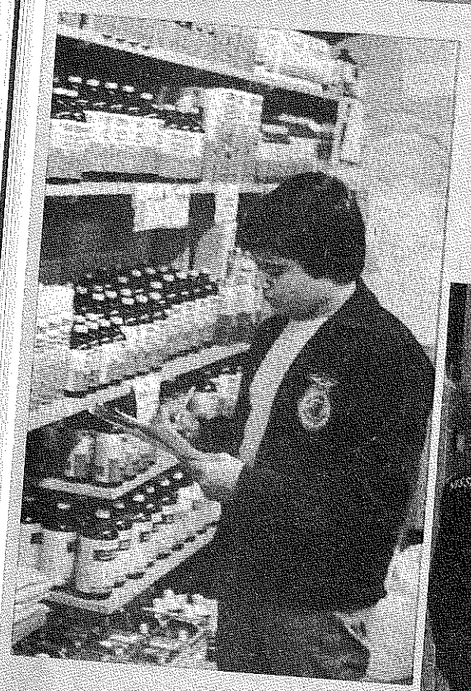
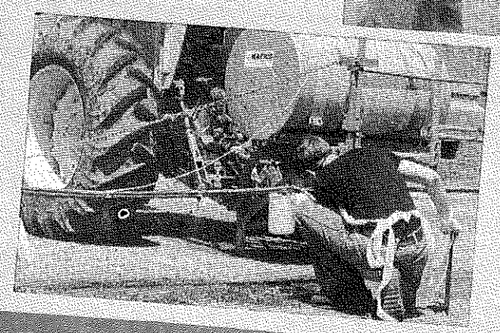
Stories in Pictures — Technology in Agricultural Industry





Modern agricultural industry requires spe technical competencies. These photographs sh students involved in agricultural supplies, ju judging, cheese manufacturing, and equipment ibration.

(Photographs by Gary Gray, Agricommunications Major, Mississippi University.)

Agricultural Education Magazine

THEME: Using Realia in Instruction

THE
AGRICULTURAL EDUCATION
MAGAZINE

August, 1980 Volume 53 Number 2

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ARTICLE SUBMISSION

Articles and photographs should be submitted to the Editor, Regional Editors, or Special Editors. Items to be considered for publication should be submitted at least 90 days prior to the date of issue intended for the article or photograph. All submissions will be acknowledged by the Editor. No items are returned unless accompanied by a written request. Articles should be typed, double-spaced, and include information about the author(s). Two copies of articles should be submitted. A recent photograph should accompany an article unless one is on file with the Editor.

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EDITOR'S PAGE

Using Realia In Instruction

JASPER S. LEE, EDITOR
(The Editor also serves as Professor and Head, Department of Agricultural and Extension Education, Mississippi State University.)

Realia are objects or activities used to relate learning experiences to the real world. Real thing or things which are as near the real thing as possible are used. The stress is on concrete examples rather than abstractions. Instruction in agricultural agriculture/agribusiness has had high usage of realia as compared to other areas of instruction in the public school. However, it is my observation that this has not been so in terms of some areas of vocational education.

Kinds of Realia

The best realia is the real thing. In the classroom, these are known as objects and specimens. A specimen is an object representative of a larger group of similar objects. A seed, insect, empty seed container, weld, or other object may be used in instruction to give meaning to written and verbal descriptions.

It is not always possible to have the real thing available. Substitutions are used. Some substitutions are more realistic than others. The most realistic substitution available should be used. In some cases, substitutions may actually be better than the real thing. For example, an enlarged photograph projected on a screen may be more useful in classroom instruction than a specimen of a very small object.

Models are recognizable three-dimensional representations of a real thing. Examples include model tractors, livestock and farm buildings. Models should resemble the real thing and be of appropriate size, color, and proportion.

Mock-ups can be used to simulate or reproduce reality. Operating, full-scale models can be used to simulate the real world situations. For example, a small mock-up of a farm supplies store may be set up in the classroom or laboratory. This mock-up can be used to develop skills needed in farm supplies occupations. However, this will not take the place of actually working in a farm supplies store. This is why supervised occupational experience is so very important!

Audiovisual aids are also included as realia. Though not as effective as models and specimens, audiovisual aids can bring realism to instruction. A picture, transparency, or recording can usually bring realism not available with the verbal explanations of teachers. Verbal images are not as effective and accurate as images developed with realia.

Why Realia?

Realia should be used because of efficiency. An instructor who uses realia is a better communicator and, therefore, makes more efficient use of the time of students and of himself/herself. Realia usually appeal to more than one sense. Some realia may actually appeal to all five senses — seeing, hearing, feeling, smelling, and tasting.

Students learn three times more through the sense of sight than through all other senses combined. Using more than verbal methods of communication is imperative.

As a communicator, the teacher must select the media which will facilitate the communication process. The role of the teacher is to initiate experiences, information, and skills. The role of the student is to interpret (and apply) the experiences, information, and skills. A channel or medium connects the teacher and student. In order to maximize the acquisition of new information and skills, the teacher must select the appropriate instructional aids to help make the attempt at communication effective. This is why realia is used.

Cautions With Realia

The first prerequisite in any sound educational program is to have objectives for the learners. The objectives may be developed by the teacher, student, or both working together. Once the objectives are set, appropriate instructional strategies must be selected. Only those instructional strategies leading to the achievement of the objectives should be used.

Using realia for the sake of using realia is of little educational benefit. The realia that are used must contribute to the achievement of the objectives. If realia don't contribute, don't use them! For example, using a model pig in order to have realia in horticulture class is counter productive in an instructional setting.

A term frequently used to describe the over use of realia is "gadget glamour." Simply, this means that the teacher is more concerned with the use of gadgetry than with the progress of students toward the achievement of educational objectives.

The proper use of realia can greatly increase the efficiency of the teaching-learning process. Like other responsibilities in teaching, careful judgement should go into the selection of realia.

August, 1980

The theme for this issue of the MAGAZINE is Using Realia in Instruction. Lloyd H. Blanton, Theme Editor, has obtained several articles which address the use of realia. Begin expanding your use of realia by reading these articles!

THEME

There Are Many Realia

By Lloyd H. Blanton

Editor's Note: Dr. Blanton is Theme Editor for this issue of The Magazine. He is also Associate Professor, Department of Agricultural Education, Clemson University.

It goes without saying that no medium is good or bad simply because it is concrete or abstract. In general, experiences which are concrete provide significantly greater depth and breadth of understanding and significantly larger retention periods. This is particularly important if students retain skills for facing and solving new problems.

The retention of facts, while necessary for solving most problems, is subordinate to the attitudes of individuals about and their approaches to new problems and situations. For example, passengers in an airplane are safer with a pilot who can adjust performance in changing wind, temperature, and gross weight conditions than with one only reciting the rules of flight and aerophysics, lacking skills to proficiently fly the plane in varying conditions.

Airplane pilots and teachers are contrasted here to show the importance of realia. Government agencies protect against incapable pilots. In education, teachers affect the capabilities of their students. A pilot trained only in simulators is undesirable. Employers do not want workers who are trained only with audiovisuals. A prudent blend of both realia and audiovisuals is essential.

Picture a student, good in academics and skilled in learning through lecture and reading. Then picture that same student, bewildered by two root systems from a local farm. The student may feel helpless and tricked when called upon to describe the two specimens — tricked because this was not the typical written query to which he or she was accustomed.

Although the student had read books about both nodules on legumes and nematode knots on other plants, no one had used specimens to teach the differences. Therefore, the "good student" was baffled by reality. There was — dramatically — the realization that books, lectures, and chalkboard illustrations left a gap in learning for "real problems."

That incident, requiring only a few minutes of the vo-ag teacher's time to collect roots of nematode-infested tobacco and soybeans with nitrogen fixing nodules, bridged the knowledge gap between "knowing about" and "application" of knowledge. It is still powerful and vivid a quarter of a century later. As back home folks would say, "There's a heap o' difference between talkin' about somethin' and doin' somethin'!"

The Cover

Many realia are available in vocational agriculture/agribusiness. This photograph shows Allen Clark of Leland, Mississippi, explaining a feature of the plant to Pamela Bowen of Grenada, Mississippi. In instruction, "real things" are most meaningful. (Photograph by the Editor.)

John Dewey, a proponent of reflective thinking, scientific method, and education for democracy, [illegible] weighty thoughts on vocational education:

"The only adequate training for occupations is training **through** occupations . . . Education through occupations consequently combines within itself more of the factors conducive to learning than any other method. It calls instincts and habits into play; it is a foe to passive receptivity . . . The vocation acts as both magnet to attract (relevant information) and as glue to hold. Such organization of knowledge is vital, because it has reference to needs; it is so expressed and readjusted in action that it never becomes stagnant."*

Theme articles this month feature numerous examples of realia utilization. Perhaps we could all benefit by greater thought to using common, everyday realia for instruction.

*John Dewey. Democracy and Education. (New York: The Free Press, 1966), pp. [illegible]

THEME

Why Use Realia In Instruction?

By Floyd G. McCormick and David E. Cox

Editor's Note: Dr. McCormick is Professor and Head, Department of Agricultural Education, University of Arizona. Mr. Cox is Lecturer in the Department.

As agricultural educators, we know a great deal about how people learn. We know that people learn with their own learnings. We have studied, and often times applied, the basic psychological laws of effect, primacy, exercise, disuse, intensity, and association. Every good teacher realizes that learning is not a "happening" but an active process. Teachers realize that students do not learn by what the teacher does. They learn by what the teacher gets [illegible] in instruction? It takes valuable time to [illegible] prepare and use resource materials! Is it [illegible] do we have to support the use of [illegible] learning process? In an attempt to [illegible] realia in instructional programs [illegible] it seems appropriate to review [illegible] affecting teaching and learning.

Teaching-Learning Process

Teaching and learning are deliberate acts. A simple definition of learning is a change in the behavior of an individual. Without change in human behavior, learning has not taken place. On the other hand, teaching is directing the learning process. The teacher then becomes the facilitator of the "change" process. Both imply and require action. In essence, the teaching-learning process is nothing more than a series of actions and interactions between the teacher and the learner.

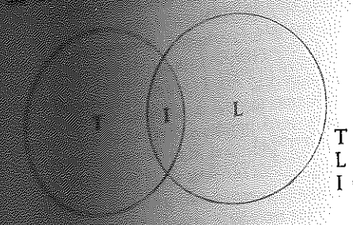

Figure 1. The Teaching-Learning Process

The greater the interaction between the teacher and the learner, the greater the relative degree of change in behavior on the part of the student, assuming the interaction is positive and directed towards the achievement of teaching objectives. The use of realia can promote more interaction in the teaching-learning process.

Motivation

What makes students want to interact and learn? Motivation is the basic element affecting a person's desire to learn. Motivation is that element which forces a person to move toward a goal, a purpose, an ambition. It is motivation that makes a student want to know, to understand, to believe, to act, or to gain a skill. Since motivation is the intangible factor that must be present to release the potential in each student, teachers need to be able to activate the motivation factor. By relying on some of the basic human needs, desires, and impulses, teachers can divert those needs, desires, and impulses into a motivational pattern. For example, curiosity is present in nearly every student, as is a desire to participate in something new. The need for new experiences is an important factor affecting motivation. If the teacher captures and guides the basic needs, desires, and impulses of students and uses any and all the tools available, motivation can be exhibited on the part of students. When teachers "bring instruction to life" by using audio, visual, and real materials and experiences, they are employing tactics to take advantage of those basic needs, desires, and impulses. Audio, visual, tactile, real, and resource materials can all be utilized to provide students new experiences.

Since learning is an active process, the action must focus primarily upon the student, not the teacher. The effective teacher thus plans a series and a variety of participating experiences for the students. Activities which promote the use of more than one sense and cause students to exhibit action in a learning environment include observing, listening, thinking, remembering, imagining, writing, answering, questioning, doing, feeling, touching, moving, agreeing, disagreeing, and discussing. The more the participation, action, and use of senses on the part of the student, the more residual learning will take place. Realia are the aggregate of all resources used to promote the use of more senses, more involvement, and more action.

Principles of Learning

Anyone who has ever been involved with the teaching-learning process knows that students learn more and better when:

- there is interest,
- needs are being satisfied,
- thinking is stimulated,
- there is active participation,
- two or more senses are used, and
- a favorable climate of success is maintained.

When these principles are put into practice by teachers, teaching will be more effective.

How does a teacher create interest? Does showing students real specimens of insects, weeds, feeds, etc., arouse interest? How much interest or curiosity is created when a new bulletin board or a new exhibit is placed in the classroom? How does a teacher help satisfy needs? Does helping students earn money, letting them actually perform a skill, or judge livestock help fulfill their needs? Can we stimulate thinking by posing a problem, or showing an item that does not work, and let the students figure the solution? How can we have student participation? If they touch, handle, do, judge, disassemble, assemble, design, question, calculate, seek, or operate, are they not participating? It should be obvious that realia can be used effectively to apply the above basic principles of learning.

Research funded by the Minnesota Mining and Manufacturing Company points out that the ability of learners to retain information studied increased with greater participation (involvement) associated with the use of more senses. Learners retain 10% of that they read, 20% of what they hear, 30% of what they see, 50% of what they see and hear, 70% of what they say as they talk and 90% of what they say as they perform a task.

Can realia help promote the retention of information? It would certainly appear so. Without looking back, what is the percent retention when students only see and hear? We rest our case! (Now, look back and see!)

One final bit of evidence which supports the use of resource materials to make teaching more effective can be gleaned from Dale's Cone of Educational Experiences.

Learning effectiveness decreases with an increase in abstractness. Conversely, the more participating experiences (action) focused upon the student, the greater the learning effectiveness, all things considered. Since the most effective learning on the part of students occurs with actual ex-

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Why Use Realia In Instruction?

(Continued from Page 5)

perience, the use of supervised occupational experience programs must be emphasized more than ever in the future. It can be assumed that a well-planned, well-conducted and well-supervised occupational experience program is probably the most effective realia teachers of vocational agriculture have at their disposal.

Based upon the above rationale, we can realize the role realia play in enhancing the teaching-learning process.

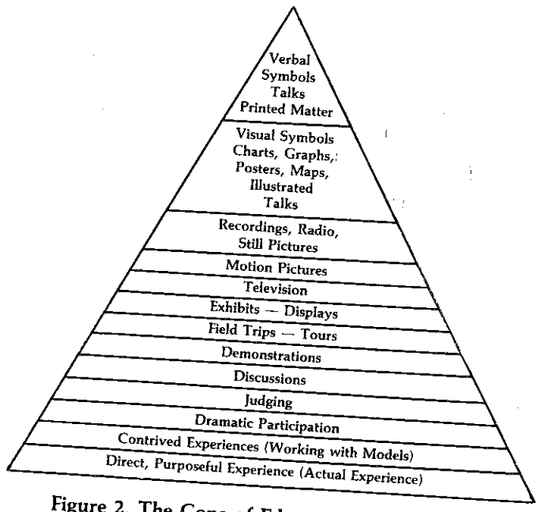

Figure 2. The Cone of Educational Experiences

Realia help teachers apply, among other things, the six basic principles of learning, minimize the degree of abstractness of educational experiences and promote the retention of information.

Functions of Realia

Realia are the sum total of all resource materials including real situations, direct experiences and activities used by teachers to relate instruction to real life. Realia are teaching tools in the teacher's tool chest which, if correctly used, enable the teacher to teach more effectively and the learner to learn more permanently.

They serve many useful functions to make teaching more effective. **First,** realia enable the teacher to provide a variety of learning experiences for students thereby adding interest to the instructional programs and thus increasing effectiveness. **Second,** they help speed up the learning process and make it more pleasant for the students. **Third,** they prevent the "pooling of ignorance." **Fourth,** realia also help involve students in the participation in their own learning. In essence, realia arouse interest, provide the concept of physical characteristics, show details of construction, develop appreciation and understanding, span time and distance, add variety to teaching, [illegible] present related information, among other things.

The end results of using realia in instruction are:

- greater student interest,
- more thorough understanding,
- increased retention, and
- more effective use of both the teacher's and [illegible] time.

What and Where to Use

Each form of realia has an educational use for [illegible] can best be applied. Most lessons which arise in [illegible] for high school vocational agriculture classes tend [illegible] rate into three main segments; namely, (1) building [illegible] for learning (introduction; (2) analyzing the problem [illegible] ysis); and (3) summary and application to the [illegible] work (summary). Realia which are effective for [illegible] part of the lesson are shown below. Flexibility of [illegible] can and should be employed to meet the needs, desires, [illegible] terests, and impulses of students.

Introduction	Analysis	Summary
Real materials	Demonstrations	Field trips
Models	Video recorder	Overhead transparencies
Exhibits	Field trips	Slides
Overhead transparencies	Motion pictures	Chalkboard
Slides	Resource people	Graphs and charts
Filmstrips	Overhead transparencies	Land laboratory
Chalkboard	Slides	Real experiences
Bulletin board	Still pictures	
Charts and graphs	Tape recorder	
Still pictures	Radio	
	Land laboratory	
	Chalkboard	
	Charts and graphs	
	Books	
	Bulletins, magazines	
	Real experiences	

Summary

The use of realia does make teaching more effective. Their use promotes the application of basic principles of learning. Using realia helps to involve students. Likewise, to promote the use of realia to make instruction in vocational agriculture more effective, major emphasis must be placed upon individual student supervised occupational experience programs.

One caution — realia have not proven a "cure all" for teaching troubles nor a "crutch' for a poor teacher nor a substitute for sound teaching plans and procedures. However, if properly planned for and correctly used, realia can make your teaching more effective, pleasant, and lasting.

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THEME

Teaching With Real Objects

By Douglas Bishop

Editor's Note: Dr. Bishop is Professor, Department of Agricultural Education, Montana State University.

A few years ago, while visiting a student teacher, we began to discuss the young teacher's perceptions of teaching and his feelings about his own performance in the classroom. Soon the discussion centered around the problem of developing student interest, and he related to me a remark one of his students had made in a class on livestock nutrition. It seemed the young lad felt that the study of nutrition, as it was being taught, was about as exciting as watching the paint on the wall dry."

Students have many unique ways of expressing their displeasure to learning. Sometimes these expressions are rather amusing. However, such remarks may be the first sign of more serious problems yet to come. My concern is that too many teachers accept such student reaction as normal for this age group or as simply characteristic of the current generation of students and do little to try to change the student's image of learning. I am not suggesting that today's teacher should become an actor capable of entertaining students, but I do feel teachers should put forth every effort to interest students in learning. Occasionally, teachers should reach into their arsenal of teaching tricks designed to motivate and bring out some real objects that can incite students to want to learn.

Motivation, the Key to Learning

Without doubt, student motivation is one of the critical problems confronting teachers today. Teacher effectiveness is proportional to the degree to which the teacher can change the meaning of learning from something that is distasteful which the students want to avoid to something interesting and exciting that students want to learn. Ideally, a teacher should try to develop learners who are able to set their own goals and who can visualize their own problems and needs. Such students could easily recognize the purpose of our teaching and could relate the instruction to their own needs. The desire to learn would come from within the student.

It would be wonderful if all students came to the vocational agriculture class intrinsically motivated. Teaching would be so easy if the entire class was excited, enthused, and eager to absorb all the knowledge and skill deemed important to their well-being. Good teachers know this is not the case so they must be realistic and seek out a variety of means to stimulate students. Using real objects is one such means.

The use of real objects, or what is often called extrinsic motivators, is often overlooked as a teaching technique. Oftentimes, teachers feel they can simply talk the students into being interested; or they feel the students are so mature they understand that what is being taught is for their own good and that they should automatically want to learn. Such an assumption often leads to a teacher's demise while putting the students on the educational defensive as far as learning is concerned. Perhaps teachers should take a lesson from today's advertiser: use fewer words and more objects and pictures that tend to captivate our attention causing us to want to try the product. The positive benefits of using real objects in teaching are numerous.

Stimulate Mental and Physical Activity

Objects can be used to call a student's attention to the more interesting and exciting aspects of a learning experience. Objects help show the student what a teacher expects in the way of behavioral change, thereby encouraging or intensifying student activity and participation. Most teachers would be very critical of a manufacturer that printed a step-by-step procedure on how to assemble a piece of farm machinery without showing a picture of the complete assembly. Yet teachers often fail to take the time to show the finished product or illustrate the effect of a principle applied to an actual situation. They attempt to describe verbally what the students should learn and hope the students will be able to visualize the result.

The effect of soil particle size on water movement in the soil is difficult for many student to understand until it is illustrated to them using a soil window similar to Object 1 (see photograph). Different soil textures can be placed in the open space between the two glass windows. By allowing water to flow slowly into the soil, the effect of particle size on water movement can be shown while discussing the movement of water in the soil. One could also plant seeds in the soil window to illustrate the effects of seeding at various depths and subsequent plant emergence or to illustrate the difference between the growth habits of monocot

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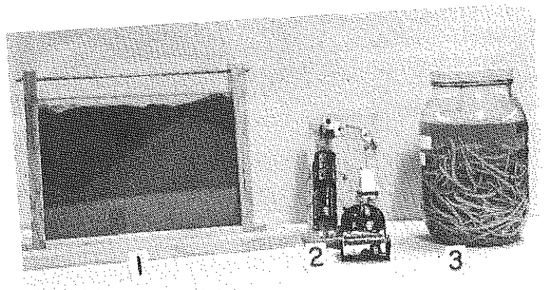


(Continued from Page 7)

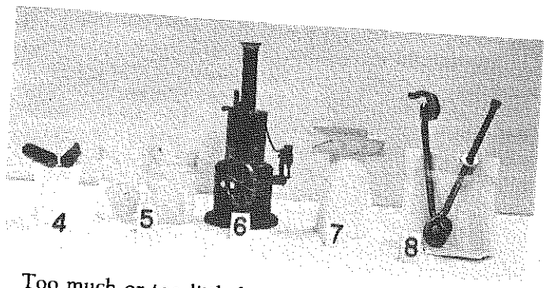
and dicot seeds. Observing real things happening most always raises the question, "why?"

A small electric motor and a model showing how a flashlight works, similar to those shown by Object 2, will help avoid boredom while teaching the principles of operation of an electric motor and the wiring of a complete electrical circuit. Most high school students simply don't enjoy studying basic principles. However, if a teacher can modify the environment in which the learning of principles is taking place by including real objects, the principles related to electric motors and electrical circuits will become less repulsive and less difficult to understand.

Improve Student Attitude Toward Learning

Students must be ready to learn if our teaching is to be effective. Oftentimes, students do not see their problems and needs for learning in the same light as the teacher. In this case, almost any attempt to teach will fall on deaf ears. Objects can be used to dramatize the need for a certain knowledge or skill, thus creating a more favorable attitude toward learning. The external object we bring to the student's attention can, in many cases, cause positive internal consequences.

Object 3 is a large jar of internal parasites. All of the ascarids in the gallon jar were taken from the intestine of a 6-month-old colt. In this case the colt died. The damage caused by internal parasites which we often do not see from the outside may now take on a new dimension in the mind of the students. Learning can become more efficient when the teacher has modified the conditions of learning with an object the students can see. In this case, they can begin to sense the real cause of the animal's death rather than simply hearing the teacher tell about it or reading about it in a textbook or bulletin. Perhaps the teacher has given the students a reason for wanting to learn about the control of parasites in their animals.



Too much or too little heat when forging a cold chisel can be just so many words until we show the result. Often students want to get the job done as quickly as possible so that they can move on to the next task. A lot of work went into the formation of the cold chisel, Object 4, before it finally broke. Most students do not like to do things over. Perhaps the misfortune of a fellow student will increase the student's attention span and desire to learn the proper procedure as the teacher demonstrates the critical steps in forging a cold chisel.

Integrate Theory and Practice

High school students find little use for a [illegible] they can see that theory applied to [illegible] comprehend and understand. Trying to visualize happen when a theoretical principle is applied [illegible] set of conditions can be difficult for many students may simply avoid trying to understand, spend looking out the window, or try to keep other students learning.

The theory of osmosis may become quite clear [illegible] students are shown its effect on a slice of raw potato. lustrated by Object 5. One slice of a freshly cut potato placed in a glass of salt water. Another slice is placed glass of fresh water. Both are allowed to set for [illegible] minutes. When removed, the potato slice in the salt water is pliable and bends easily illustrating the loss of cell ture while the second slice of potato in the fresh water very turgid, indicating the cell moisture is very high. Osmotic action has taken place because of a difference specific gravity between the salt water and the fresh water. The teacher can further prove the theory by exchanging the two slices and showing the results. The effect of osmolinity on plant growth can also be illustrated with this ple demonstration using this real object.

Object 6 is a small steam engine which will create a high interest when teaching the theory of the internal and external combustion engine. Add a plastic see-through model an internal combustion engine and the introductory lesson in farm power can become a very meaningful and rewarding experience for the class.

Help Visualize Learning

It is very easy to give an inaccurate picture of what to results of learning will be if real objects are left out of teaching. Visualizing the outcome of learning is quite difficult for many students. Not being able to see the final product may be getting in the way of good student performance.

Drawing and sketching is an area where students often have trouble visualizing the end product. A block cut from of scrap wood, such as Object 7, will help the student see what an actual three-dimensional object would look like drawn as a front, top, and side view on a flat surface.

Showing a finished project such as Object 8 may cause some students to want to learn new skills in order to build individual projects. Using such projects to illustrate the potential result of newly acquired skills may strike a competitive chord in some students, thus resulting in improved workmanship and increased productivity because they have been shown the potential results of learning a new skill.

To Benefit the Teacher

Teachers as well as students benefit from the use of real objects in teaching. It is generally agreed that teaching is a difficult and complicated task that can be made easier by using a variety of teaching aids. Some teachers accept this challenge while others find that preparing interesting and useful teaching aids to bring about more effective learning requires too much time and work on their part. Even the use of prepared aids and the collection of objects at hand often seem too troublesome. Many are aware of the bene-

[illegible] real objects to develop student interest; but [illegible] neglect, they do not put this knowledge [illegible] practical application.

Using real objects adds diversity to teaching and results [illegible] than just so much humdrum activity for the [illegible]. Preparing and assembling such items tends to [illegible] the teacher to get out of the comfortable rut, gives [illegible] instructional activity, and helps develop a contagious enthusiasm which is so very essential to encouraging student participation.

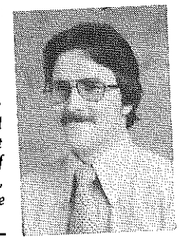
Combating student boredom and apathy toward learning is a constant concern of the effective teacher. Perhaps some students feel their teacher lacks credibility because they are never shown the results of learning. Incorporating real objects into teaching can help make learning an active rather than a passive process when the teacher becomes a director of learning rather than a disseminator of information. Teachers must not simply inform students but rather raise questions in their minds -- questions to which they will want to seek answers.

Conclusion

Simply using real objects in teaching will not assure success for a teacher. This technique is not an alternative to an effective introduction but should be a component of the introduction. The technique does not take the place of oral communication, but it will go a long way toward clarifying the message a teacher wishes to convey to the students through the spoken word. The use of real objects is only one of many techniques that a teacher should be using, but it may be the most practical and useful way to develop student interest.

THEME

There's More To Birds Than Just Feathers!



By James S. McCoy
and
Raymond H. Morton

Editor's Note: Mr. McCoy is a Graduate Assistant and Dr. Morton is Assistant Professor, Department of Agricultural Education, The Pennsylvania State University.

"What I hear I forget
What I see I remember
What I do I know."

These words are inscribed on the USDA Building in Washington, D.C., and point out the importance of hands-on experience in learning. The hands-on approach has always been successful in the teaching of laboratory skills. However, when instructors enter a classroom to teach concepts, principles, or theories, they frequently resort to lecture or simulated problems. Students often have difficulty in understanding the connection between a paper-and-pencil assignment to balance a ration and actually feeding a steer.

If students have a well-organized SOE program dealing with animals, it is easy for the instructor to relate the importance of proper management skills when dealing with livestock.

How do instructors with urban students or students who do not have an opportunity to have an animal SOE project teach hands-on experiences effectively? What other method is available? These questions need to be answered if the vocational agriculture instructor is going to be effective in the classroom when dealing with animal technology. The best solution would be to bring steers or market hogs into the classroom and raise them using approved production practices. However, the school principal may take a dim view of this approach!

A method that takes very little space, and is quite feasible, is the use of small animals as teaching units. Any small animal may be used, but poultry and game birds seem to be the most successful in teaching various animal science and agribusiness skills. Also, scientific concepts such as embryology, genetics, nutrition, anatomy, and physiology can be taught with equal success.

Edward A. Schano, Professor of Poultry Extension at Cornell University in New York, has designed a curriculum that uses birds and the incubation of bird eggs in teaching embryology to students in schools throughout New York. He has had great success with the youth program in New York City schools, where thousands of students are fascinated with the complex nature of incubation. This program has maintained a high level of interest and seems to be growing each year.

Samuel Varghese, Poultry Youth Extension Specialist at Michigan State University, developed a program four years ago using Courtix quail (Japanese wild quail) in the classroom to teach the concepts of reproduction, nutrition, physiology, genetics, and incubation. He plans and conducts workshops for interested teachers who then go back to the classroom and use the quail to stimulate the interest of their students. Great success has also been achieved in Detroit, Michigan, where some students have never seen chickens, much less cared for quail. It must be emphasized that the students in this program are not, for the most part, farm-oriented; they live in the city where exposure to production agriculture is slight.

There are many cases where agriculture teachers across the country have been successful in teaching hands-on skills using demonstration techniques. But, for the most part, only a few students actually handle animals, and

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There's More To Birds Than Just Feathers!

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fewer yet perform the skills being taught. This is not necessarily the fault of the agriculture teacher. For example, it may be physically impossible to teach innoculation of animals to 25 eager students when you have only three sheep available. By the time each student catches, restrains, and tries to innoculate an animal, time runs short and so do the instructor's nerves. Limited benefit is derived from this type of teaching technique. The situation is reversed if each student has to innoculate ten sheep, but this is almost always impossible.

Is there a difference if a student innoculates a bird instead of a sheep? None. The technique is essentially the same. The student must also catch, restrain, and administer the medicine properly. Is there a difference between formulating a feed ration for a group of steers, pigs, or sheep and a flock of birds? There is no difference. The ration may contain different ingredients and amounts, but the techniques in formulating and mixing are the same.

These same questions can apply to the handling of animals, identification, health care, culling, minor surgery, record keeping, cost analysis, diagnosis of disease, marketing animal products, and other skills needed to be successful in animal production. In all cases the answer is the same — birds can be effective realia in teaching these skills if large animals are not available or not practical to use.

Any successful producer of livestock will tell you that observation is one of the keys to profit. Producers of cattle know when an animal appears diseased or does not seem normal. Sheep producers know when disease is a problem in their flocks through continual observation of animals. If students learn nothing else from their vocational agriculture instructor, they should be made aware that observation of living organisms is the most important method in preventing problems. Is it not better to teach observation skills by having a student responsible for two birds or a group of birds? What student will not be [illegible] or her birds get infected with a disease or die? dents will not ask "why?"

In asking why, the student is displaying a [illegible] and this curiosity is helpful to the instructor.

Developing a small animal program for your [illegible] ment is not as difficult as it may sound. Here are [illegible] gestions that may prove helpful:

1. Make sure the **students are responsible** for [illegible] birds, and you do not become the caretaker.
2. Have students develop a plan for their [illegible] cluding record keeping, skills inventory, and [illegible] The students can buy birds and equipment [illegible] chapter can purchase them with the students [illegible] the department at the conclusion of the program.
3. Gather all the facts from agricultural extension [illegible] and state college or university departments of [illegible] science.
4. Find out if there is a market for your product [illegible] product is to be sold.
5. Have students build or purchase suitable [illegible] may be obtained from game bird breeders or [illegible] poultry businesses.
6. Take dead birds to a local diagnostic lab or the [illegible] university for autopsy. If you feel confident, perform [illegible] autopsy yourself. The information obtained is valuable [illegible] the students, and it is first hand!
7. Use the latest techniques and concepts.
8. Check with local game commissions for the type [illegible] that is suitable to your area. Courtix quail and Chukar [illegible] partridges are two types of game birds that lend themselves [illegible] to this type of program.
9. Assign students their own birds. This assures that [illegible] responsible for their birds, and they get full benefit [illegible] this responsibility.
10. Ask science teachers if they would be interested [illegible] using birds in their programs. This stimulates school-wide [illegible] interest.

Using poultry as teaching units in the classroom can provide a dynamic teaching and learning experience. A program of this type will provide the necessary means to teach animal science skills through hands-on experience especially in urban areas. The instructor is able to set up realistic situations and problems which the students can solve through their own involvement with animals.

If the agriculture instructor believes that students should "learn by doing," a program that uses poultry as [illegible] units can provide a golden opportunity for the students to acquire and practice husbandry and management skills prohibited in the normal classroom situation.

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THEME

Using Real-Life Experiences Helps Make Your Program Vocational

By Roy D. Dillon

Editor's Note: Dr. Dillon is Professor, Department of Agricultural Education, University of Nebraska-Lincoln. He is also a past Editor of The Agricultural Education Magazine.

The opportunity for every student to have exposure to real life experiences is the backbone of a successful vocational agriculture program. The teacher can, in the instructional phase, introduce students to the realism of the working world they will encounter after secondary or postsecondary school.

In the process of teaching inservice classes and observing first year vocational agriculture teachers, I have seen them use many excellent "real experiences" in their teaching. Several are discussed here.

Real People

Employers and employees in agriculture and agribusiness can accurately describe and demonstrate skills of their jobs. Many secondary school age youth do not comprehend the typical work day of an agricultural or agribusiness worker. Bring the employer or employee to the school, with some of their trade tools if possible. Another alternative would be to have the student "observe alongside" the employer or employee, for one or two days to learn and evaluate the skills and responsibilities of the jobs.

Real Objects

We have an advantage in vocational agriculture. The tools and equipment are easy to secure, especially in rural areas. The trick is to have the real objects on hand when needed. One agriculture teacher had a priority to have at least one motivating object for each class at least three times per week. She kept the objects accurately cataloged and stored for quick retrieval when needed. One of her summer tasks was to obtain objects for future use, such as grains, grains, weed and crop specimens, and equipment parts. Students were especially resourceful in helping locate and obtain desired objects. In many cases the objects can be obtained free of charge. Samples of fertilizers, grains, chemicals, and other agricultural supplies are often donated when the agribusiness knows of the educational purposes.

Real Settings

Performing demonstrations and discussing job performance skills on an actual job site helps the student to see relevance to the job more easily. Machinery calibration for example, could be completed on the farm. The school agricultural mechanics laboratory, land laboratory, and greenhouse are excellent simulation sites, where the school contrasts the surroundings rather than an employer.

Real Paperwork

One way to practice the need to be a good communicator is to use samples of actual order forms, letters, receipts, and records of local agribusinesses. The use of sample forms which are familiar makes it easier for the student to relate to the need to write and speak clearly.

Real Senses

The touch, smell, feel, hearing, and sight senses can be tuned to help the teacher, especially if motivations are used which affect two or more of the senses at one time. The odor, touch, and sight of different grades of cured hay is one example. Holding and feeling a laying hen when inspecting for culling is far preferable to looking only at pictures.

Real Activities

The best practice ground for democratic group activities is the FFA program of activities. Committee and group decisions are fostered. In addition, in-class group projects which encourage group decision making can build student confidence. A group cooperative that produces bedding plants in the school greenhouse is one example.

Real Student Problems

Supervised occupational experience programs are excellent sources of classroom problems. One first year teacher devoted one class session per week to discussing student problems relating to their occupational experience programs. Another teacher was flexible enough to sometimes adjust a daily scheduled topic to enable the class to discuss a student problem which occured.

Good Organization Needed

In order to plan the use of real people, object settings, paperwork, senses, group activities, and student problems, a well organized curriculum is needed. You can build a li-

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Using Real-Life Experiences Helps Make Your Program Vocational

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brary of objects and ideas over a few years, but if you learn to let your students help gather objects the time will be shorter. Also, if you use occupational experience programs as sources for class discussion, student participation will tend to be more practical.

Support Staff

Is there a retired farmer living near who might to assist you on a part-time basis, and maybe a amount of pay? These persons have valuable and can help organize in-school and field trip

To what extent do you have "real" experiences types built into your local program? Perhaps would be a good time to "beef up" your lesson "realistic experiences".

THEME

Little Things Make A Big Difference

By Gale L. Hagee
Editor's Note: Dr. Hagee is Assistant Professor, Department of Agricultural Education, Virginia Polytechnic Institute and State University.

Realistic daily applications are needed for efficient learning! Students need to be confronting new skills and practical exercises that are as near to actual working experiences as possible. It is meeting this need for realistic experiences while the students are in our vocational agriculture programs that makes them employable and competitive in the job market.

Basic Skills

Students who exit our program need basic employment skills. They must be mentally prepared to face the demands of the everyday working world. They must be socially prepared to adjust to the problems of getting along with their fellow worker. They must be ready to compete in securing a place in the job market and be able to retain that elusive goal once they secure it. The way they get their basic skills makes a big difference. That difference is what makes learning enjoyable, that causes students to like school and to say, "Vocational agriculture is where all the other subjects I've had in school start to make sense." Isn't this comment the dream that keeps us teaching?

The vocational agriculture program can and should develop a realistic program that is meaningful and enjoyable. It is our responsibility as teachers to lead the students through experiences that make them competent for America's competitive job market. Many times we pass up the opportunity to take advantage of a realistic learning activity. It is the "little things" that make the "big" difference.

Making Vo-Ag Vocational

Little differences take many forms and shapes. Teachers must program their thinking to believe they are vocational instructors. Learning experiences must be vocational in nature. The transition for the college student to teacher of vocational agriculture is major, to say the least. College students have been subconsciously modeling themselves after their favorite college professor and zap! They find themselves giving lectures to high school students the same way they have been lectured to for the past four years.

So how do we make learning realistic? Research indicates that the method of instruction affects the time required for completion of given tasks. This means learning experiences using the actual equipment or equipment similar to that used in the actual job situation is the most efficient way of learning. This is predictable, so let's look at a few examples of making learning realistic.

Cooperative occupational experience programs are prominent as realistic methods of instruction. These methods are ideal for the placement of students with employers for actual training in the ways of the working world. Unfortunately, this type of training does not fit into many local school programs.

SOE programs are the tried and true realistic approach. They have been alive and functioning in our schools for many years. They give students the opportunity to put learned skills into practical application. SOE is parallel with the FFA motto: "Learning to Do, Doing to Learn and Living to Serve." That is vocational agriculture.

Role playing in the classroom with the class members and/or a few invited guests makes a realistic atmosphere for learning. What an educational experience to be put on the spot by a real "live" employer in a mock interview. Role playing can take many forms. Did you ever think of asking possible employers to come in and help evaluate a hands-on examination?

Other forms of realism can be found in the agriculture business classroom. The forming of corporations, including the buying and selling of stocks, can be a real learning experience. A thought-provoking teacher can easily create decision-making games so students can have experiences in buying and selling livestock or deciding what and how much to plant.

Examples

While the many other aspects of learning that can be made realistic. Teaching aids are old stand-bys that have proven their great worth across the years when lecturing didn't. They have pictures of good and bad welds, which gilts to select, which insects are most likely to attack our plants, and what is in that bag of seed or fertilizer. With very little money and a bit of ingenuity, the following ideas may help make learning more realistic.

— Grooming and/or showing livestock at school.
— Making repairs on "live" power equipment of farmers and students.
— Securing approval for students to be released during part periods of employment to work in agricultural businesses.
— Agricultural mechanics displays in the school cafeteria during lunch periods.
— Videotaping job interviews in conjunction with English classes.
— Telephone interviews with farmers, ranchers, and business people.
— Student-run surveys on job market potential.
— Keeping records on livestock.
— Demonstrations of parliamentary procedure for civic groups.
— Tours of industries, farms, or horticulture facilities.
— Films of the daily lives of the people who make agriculture important.
— Role playing of buying and selling.
— Making useful projects in the laboratory for community improvement.
— Testing adjustments on equipment in the land laboratory.
— Planting trees and shrubs.

Realistic instruction is no accident. It is based on the needs of students and the creativity of the teacher. These two important factors go hand in hand to make a worthwhile and challenging program. It's because of the little things that the teacher does to inspire learning that we hear the response, "Vocational agriculture is where all the other subjects I've had in school start to make sense."

THEME

Student Teaching — A Reality Experience

By Wendy Jo Nye
Editor's Note: Ms. Nye is a graduate student at the University of Georgia.

As a recent student teacher in a vocational agriculture program, I was exposed in reality to concepts I had only previously been told or had read about in my college instruction. I quickly learned through "doing" what succeeds in the classroom. I became aware of those instructional techniques that captured the attention of students and those that left them gazing out the window. I soon learned the value of using real situations and real materials for maximizing learning and retention.

While some of the techniques I tried in the classroom were successful and others were not, each one afforded me an opportunity to observe and formulate conclusions based on real situations.

For example, on days when I would devote most of the time to lecturing for general knowledge, I found students constantly begging to be allowed to go to the greenhouse. When the begging persisted, I knew that I had to alter my instructional approach. It was at this point that I realized how little information the students were retaining from my class "lectures."

Lecture Versus Reality

I was used to straight lecture and note-taking as the primary source of information after spending the past several years in college classrooms. I quickly found that this lecture and note-taking approach was not best for the average high school student. I had to change my instructional approach in order to re-capture their interest in learning. I had to make the most of their great enthusiasm for time spent in the greenhouse.

I began to select key points in my classroom exercises for short discussions. I tried to focus on information that they would need in order to perform the necessary tasks in the greenhouse correctly. One example is the unit on germinating bedding plant seed. After briefly reviewing the steps in the process at the beginning of each period, the class went to the greenhouse where they planted seed. A poster listing key points to remember was on display, and I remained in the area to help with verbal instructions.

This short discussion — plus a long laboratory period each day — seemed better suited for learning rather than classroom lecture every day for the entire period followed by separate lab days. The students were able to learn the necessary information as they were actually engaged in the process.

It became apparent to me that no classroom lecture can take the place of learning through doing. However, it was also clear to me that the students must develop certain classroom skills. I utilized worksheets, exercises, and individual reports to strengthen these areas.

Students Accept Responsibility

During my student teaching experience, I noticed that students welcomed the added responsibilities placed on

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Student Teaching — A Reality Experience

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them when working with long-term projects. They seemed to show an added interest and concern for projects which they started and would see through to completion.

This instructional technique in particular enhances the concept of reality in the classroom. By placing students in situations which closely approximate those found in real life, they must solve problems as they are encountered in order to be successful. Self-satisfaction and a strong sense of achievement are developed in the individual.

For example, one means of adding reality to the teaching situation in greenhouse crop production is to assign each student the responsibility of producing one particular bedding plant, such as tomatoes. In effect, this becomes the students supervised occupational experience program even though it is conducted in school-provided facilities. This

provides the student with real problems for [illegible] have the responsibility for solving. Problems [illegible] cludes ordering seed, obtaining media, planting [illegible] ing during the germinating process, transplanting [illegible] lings, caring for transplants, and marketing the [illegible] job provides an opportunity for students to learn [illegible]

While classroom lecture and book work will [illegible] neither will a few weekly laboratory periods. Long [illegible] laboratory assignments allow for continued [illegible] on the part of students. Working toward some [illegible] develops a sense of long-term responsibility.

As a student teacher, I also learned how important [illegible] to utilize supervised occupational experience [illegible] (SOE) as a supplement to class instruction. While [illegible] always been an integral part of the vocational agriculture [illegible] program in rural schools, this has not been true for [illegible] ban schools with a horticulture program.

SOE needs to be utilized more in horticulture programs [illegible] to provide the basis for "reality learning." SOE is a [illegible] mental learning technique by which the student is [illegible] involved and committed to long-term projects. The [illegible] ing does not stop at the end of the chapter or at the [illegible] the class period. Learning in SOE is learning by doing on a [illegible] daily basis.

Student Teaching: A Reality Experience

My student teaching experience allowed me to [illegible] more about teaching techniques by actually involving myself [illegible] in the classroom as a teacher. Of all my training, this [illegible] period of involvement was the most important. I learned [illegible] by doing. This relatively simple concept can be applied to [illegible] student teachers as well as to vocational agriculture students. The average student will learn more by actually becoming involved in some related task.

The instructional techniques I learned while student teaching have prepared me to utilize concepts which bring reality into the classroom. These techniques aid me in reaching students and involving them in tasks which allow for learning through the process of doing.

BOOK REVIEW

TRACTORS AND THEIR POWER UNITS, by Walter M. Carleton, John B. Liljedahl, David W. Smith, and Paul K. Turnquist. New York: John Wiley and Sons, 1979, Third Edition, 420 pp., $22.95.

This is the third edition of the text since its inception in 1951. The authors have not changed their primary objective of "providing a suitable textbook for teaching courses on tractors and their power units to students in professional agricultural engineering courses."

Though directed to the needs of the agricultural engineer, the information provided could be useful to a student of agricultural mechanization.

The authors have done a fine job of blending the theories of the academic world with the pragmatism of industry. Liljedahl and Turnquist are both professors of agricultural engineering, while Carleton is involved in research for the United States Department of Agriculture and Smith is a research engineer at the Technical Center for Deere and Company.

Instead of a general bibliography at the end of the text, the authors have provided a bibliography at the end of each of the sixteen chapters. The references provided should certainly assist the advanced student or professional agricultural engineer.

The problems located at the end of each chapter will challenge the agricultural engineering student to test his knowledge, but may frustrate the agricultural mechanics student.

As the authors stress, students using this book as a text will need certain prerequisite coursework. Courses in mathematics, engineering physics, thermodynamics or heat physics, and engineering mechanics should logically precede the use of this book.

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THEME

From Sahara To College: Realia Are Necessary

BY PETER B. DREISBACH
Editor's Note: Mr. Dreisbach is a graduate student at Clemson University.

[illegible] of our knowledge is undoubtedly based on faith, but by far the most substantial part of our accumulated knowledge has its roots in realia. The term "realia" is new to you, but the concept is familiar.

Experiences from Sahara Desert

Perhaps a word about my background will better explain why I feel the way I do about realia. I was born and reared in missionaries, a medical surgeon and a registered nurse, who have spent over thirty years of their lives ministering to the nomads in the Sahara Desert. These nomads, the most underdeveloped people in the world, are also the most isolated from all but their own small world.

Many examples come to mind of how various types of media, other than realia, were insufficient instructional tools in teaching these people. Also, there are some instances where media only serve to confuse. I remember once, as a young person, trying to explain what snow was. An incident comes to mind of giving a friend an ice cube from our kerosene refrigerator. He promptly slung it to the ground exclaiming that it was "hot."

To most westerners this is humorous. We have been exposed through realia to the difference between the extremes of hot and cold. At the same time, realia has given the Sahara nomad many words for sand and the Eskimo many words for snow. Through no amount of words or pictures could I have explained to my friend that ice was "cold" rather than "hot." He had to learn the difference by way of realia.

Another time I was vehemently called a liar when I was informing a friend that buildings can be multi-storied. He was justified in his reaction to this information because the tallest house he knew was our house, which was constructed of sun-baked mud brick and would surely collapse if stories. I presented postcards and drew pictures of storied buildings, but the response was always, "That cannot be true!" Realia has taught us that multi-storied buildings can and do exist.

The failure of flat media to explain multi-stored buildings brings to mind the time we showed a film which contained a closeup of a flower opening with time-laps photography. The screen was about eight feet by eight feet. Of the entire film, the only portion that was remembered was the fantastic eight-foot flower that peeled open in just minutes. What a wonderful flower indeed! In this case, soft ware gave a false impression that no amount of words could correct.

College Courses

Directing thoughts back to personal experience, I could trace all of my learning back to realia. Directly applying thoughts to vocational agriculture, two particular areas come to mind. One is the teaching of bovine artificial insemination by realia versus some other media. In my case, we had diagramatic "handouts", pictures, and even a life-size model cow in the classroom; but it was not until laboratory that I actually learned the process. By observing my classmates, I am convinced that I was not unique.

Judging livestock is another area that demands realia. A professor in college, who had taught for many years and developed the reputation of being a good judge of livestock and an excellent teacher of the subject, told me once that there was absolutely no substitute for realia. In spite of all the fine media at his disposal, the professor claimed that students do not learn to judge livestock until they are actually called on to judge live animals.

Use Realia

For best results, subject matter should be based directly on realia whenever possible. The further the instruction is from reality the harder it becomes to learn and the less it will be retained — and retention is the ultimate goal.

Parallels can be drawn from the incidents cited above to agricultural education in the 1980's. The first consideration is that media may serve only to confuse rather than clarify.

With scheduling difficulties and rising costs for transportation making quality field trips more difficult, the teacher of vocational agriculture must create new and innovative ways to bring realia into the classroom. As vocational agriculture teachers, we must put forth effort to determine when and where various media are actually fulfilling the teaching objectives. Wise use of more abstract media is essential when concrete realia are unavailable or impractical.

THEME

Using Real Situations For Maximizing Learning And Retention

By Donald G. Farrand
Editor's Note: Mr. Farrand is Coordinator structor at Schuyler-Chemung Elmira, New York.

There is no substitute for real learning situations to maximize student learning and retention. Students who have been instructed using this teaching strategy are or will be successful leaders in the community and employable in vocational occupations. Real situations and real materials for a successful vocational agriculture program are obtained directly from the community served by the school district.

Advisory Committees

Advisory committees are essential in planning and organizing a realistic vocational agriculture program to provide consideration of factors which arise out of community needs and resources. Advisory committee members should be selected from the various agriculture fields represented in the community. This strengthens the planning and organizational procedure of the vocational program. Committees can identify entry-level tasks in their respective fields which the student must be able to perform in order to be employable.

Two important points should be considered when organizing an advisory committee. First, select members from industry and private enterprises to maximize experience in your vocational program. Second, use these members in planning, implementing, revising and evaluating your program.

Community Agencies

Local, county, state, and federal agencies should be incorporated into agriculture programs. The cost-sharing program of the Stabilization and Conservation Service of the USDA should be used when teaching forest and plantation improvement and soil erosion control on school land laboratories. Students should be taught the principles behind cost-sharing incentives, and how and where to obtain them.

State foresters should be used to explain the value of timberstand and plantation improvement and teach students which trees should be marked for felling. Students then have the task of felling the trees safely with chainsaws. The trees can then be cut up into logs, bolts, or cordwood to be sold and delivered in the community.

The Soil Conservation Service technicians in the county should be consulted for advice and technical help in constructing ponds, diversion ditches, strip cropping, and other conservation practices conducted by the students.

Students can plant willow shrubs along streambanks; seed, fertilize, lime, and mulch newly constructed pond dikes; remove debris from pond overflow structures, and plant trees and shrubs for wildlife for the county soil and water conservation district.

Employers are requiring employees to have [illegible] first aid and cardiopulmonary resuscitation (CPR). local Red Cross should be contacted to teach this ized training to agriculture students.

The county Cooperative Extension Service [illegible] training session for agriculture students, instructors the general public to enable them to take the exam for pesticide applicators license. This training session amination can be conducted at the high school or cupational center.

Community Services

Vocational centers and local schools are appropriate cations to offer community service programs for and adults. The agriculture instructor is also an appropriate person to teach these programs.

In order to obtain a hunting license in New York an individual must receive a minimum of six hours hunter safety instruction consisting of classroom and range course work plus passing a written examination.

A snowmobile safety training course is offered to youths from ten to sixteen years of age to obtain a permit to operate a snowmobile in New York State. The training involves a minimum of four hours of classroom and snowmobile operation plus a written exam.

The Youth Conservation Corps (YCC) program provides summer work for youths fifteen to eighteen years of age. It is a work/learning situation consisting of six weeks. Enrollees are on the job forty hours a week and are paid for thirty hours at the minimum wage. Ten hours per week for classroom or laboratory instruction. Enrollees are trained in forestry management, outdoor recreation, wildlife management, and range management.

Adult Education

Successful vocational agriculture programs offer adult education courses in the specialty areas: farm production and management, animal science, agriculture mechanics, conservation, and horticulture. It is important that these courses include laboratory work, not just classroom lectures. Guidance departments, young farmer organizations

[illegible] Extension Service provide information [illegible] needs in specialty areas.

Vocational Agriculture Curriculum In New York State

The direction of vocational education in New York State is toward competency based instruction. Competencies are [illegible] skills expected of employers when entering an occupation. The tasks are identified by people in industry. For instructional purposes, the duties assigned to a worker are organized into modules of instruction of the related tasks. The vocational occupational programs provide courses to develop skills essential for specific or specialized jobs. Developing these tasks is the role of the advisory committee.

Land Laboratories

School land laboratories provide an excellent area to maximize real learning situations. The problem is that not all schools are fortunate enough to have land laboratories. Instructors should investigate the possibility of leasing or renting land from their local village, town, county, or state government. Many government agencies are pleased to have land under their control utilized for educational purposes.

Public Relations

Public relations are important in vocational programs. This is especially true when it is time to request new equipment and supplies. The FFA provides an excellent opportunity to maximize learning and retention by using real situations. This can be done by motivating FFA members to participate in the following types of contests: leadership, agricultural production, agricultural mechanics, horticulture, and conservation. Also, FFA members should be motivated to compete for degrees and awards. Working to earn an award or degree stimulates learning and retention.

The resources to provide realistic learning experiences exist in the school and community. Teachers can maximize learning and employability by organizing their program to utilize these resources.

BOOK REVIEW

Beef Production And Management by Gary L. Minish and Danny G. Fox. Reston, Virginia: Reston Publishing Company, Inc., 1979, 416 pp., $14.95

This book provides the student or [illegible] with the guidelines for breeding, feeding, and managing a successful beef cattle enterprise. It highlights those practices or factors which have the greatest impact on production costs. The management practices which hold the line on costs and optimize returns are emphasized. Suggestions for improving the herd through selective breeding and improved nutrition are given.

Much emphasis is given to methods available to the beef cattle producer to help offset high costs. Help is given in setting priorities and methods to improve management techniques and overall herd quality. Advice is given on how to select the most productive breeders, feed for optimal growth, raise and finish beef cattle, and market those ready for slaughter.

The first six chapters of the book deal with breeding and managing the cow-calf herd. Guidelines for selecting breeding stock are given. Various mating systems are outlined and evaluated. Practical guidelines are also provided for managing the beef herd, including the overall management system for the complete reproductive cycle of the beef herd. The last seven chapters of the book deal with such areas as selling, buying, and managing growing and finished beef cattle. Three of the chapters deal with nutrition.

Both authors have extensive research and practical experience with beef cattle. Dr. Minish has taught beef production for over 12 years and is recognized world-wide as an authority on cattle judging. He is now at Virginia Polytechnic Institute and State University. Dr. Fox is a professor of beef cattle research at Cornell University. He is noted for research resulting in the development of a net protein system for formulating rations for growing beef cattle and development of computerized systems for ration formulation.

The book would be an excellent text for junior or senior college students and, perhaps, for advanced high school classes. It would be an outstanding reference for the vocational agriculture teacher and a very fine addition to the vocational agriculture library.

Joe R. Clary
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Raleigh, North Carolina

Practical Farm Buildings, A Text and Handbook, 2nd ed., by James S. Boyd. The Interstate, 1979, 278 pp., $7.95.

Practical Farm Buildings is filled with many illustrations and tables of essential information which would be extremely helpful in planning a farm building. The 109 tables of information makes this book a handy resource of information about buildings from the standpoint of economics, construction materials, space requirements, load limits, hardware, and conveyors.

To make the book easier to use, there is a separate list of tables in addition to the Table of Contents and Appendix. There are also fifteen chapters of information focusing on different areas of farm buildings, materials, and construction.

Practical Farm Buildings is both a text and a reference. I would recommend it as a text for any vocational agriculture class studying building construction and/or materials. It will help the layperson in planning, designing, construction, and remodeling farm buildings. This text may also suffice as a text for a junior or senior college course.

Bill Conklin
Vocational Agriculture
Fairbanks High School
Milford Center, Ohio

Letters To The Editor

"Letters to the Editor" is a new feature of the MAGAZINE which is being tried on an experimental basis in this issue. It is intended to encourage dialogue among readers of the MAGAZINE. The call for letters was initially announced in the Editor's Page of the June, 1980, issue. Selected letters will be printed without editing or comment. Your letter will be welcomed! (Send letters to: Editor, THE AGRICULTURAL EDUCATION MAGAZINE, P.O. Drawer AV, Mississippi State, MS 39762.)

Editor:

I am writing in reference to the cover picture on the June, 1980, issue of the AGRICULTURAL EDUCATION MAGAZINE. My question: Who selects pictures for this publication? Another flagrant violation of having proper safety protection for students working on agricultural equipment.

The 1979 issue of the FFA calendar had five or six pictures where all concern for personal protective equipment was avoided. Now, you are allowing the same to happen in the AG ED MAGAZINE, and further, I note that the photo came from the National FFA Center which makes it even worse.

We in the agricultural mechanics field work extremely hard to promote the proper use of personal protective equipment, especially the wearing of industrial quality eye protection. We in teacher education work deligently with our undergraduate students. I even read, word by word, the ANSI standards and our Iowa Eye Safety Code to my senior students. For years, we have required and enforced the wearing of industrial quality eye protection during the National FFA Agricultural Mechanics contest. Today approximately 40 states have eye safety laws or codes.

A year ago I wrote an article, and it was published in the May, 1979 issue of the National Future Farmer magazine. I have submitted an article for the September issue of AG ED MAGAZINE on the latest ANSI Standards for eye protection in our school shops. Yet it seems our written and spoken words fall on blind eyes and deaf ears.

It really bothers me to see a picture such as this young man working on a sprayer. I realize the machine is stopped as he is tightening the hose clamp, but can I assume he puts on his industrial quality glasses or goggles when the machine is started to avoid receiving a blast of chemicals in his eyes? In addition, he most certainly should be wearing chemical proof gloves for hand protection.

Actually the picture on the back cover, upper left isn't any better as industry would require a hard hat, eye protection and possibly gloves for running a fork lift truck. At least the truck does have an overhead protection unit.

My question again, who selects pictures for your publication? Do we in agricultural education have an obligation to help agriculture be better than the third most dangerous occupation? I believe we do. Please, either don't print pictures of students working without proper protection or have someone who knows review the pictures before they are printed. Thank you for your concern.

Thomas A. Hoerner
Professor
Iowa State University

* * * * *

Editor:

Congratulations on the previous issues of THE AGRICULTURAL EDUCATION MAGAZINE. I believe the appearance of the magazine has made a marked improvement since you took the helm.

I was glad to see all the photographs of FFA members at work in your June, edition. I would appreciate a xerox copy or two of the June edition for my files here — I like to keep a copy of any published work.

The office copy we received has the sticker "Complimentary Copy From The Editor," across the bottom of the cover shot. The FFA member, by the way, is Julian Brown, 1979 winner of the FFA national award in agricultural mechanics proficiency. Julian was the subject of a feature story in our magazine back in the April-May, 1979 issue.

Best wishes for continued success with THE AGRICULTURAL EDUCATION MAGAZINE.

Jeffrey Tennant
Associate Editor
THE NATIONAL FUTURE FARMER

* * * * *

Editor:

My commendations on your excellent work as Editor in this and past months. You have an interesting and varied selection of topics and authors.

The June issue is of particular concern to me. First, in your editorial and the subsequent articles, I find virtually no mention of the most important function of a summer program, instruction of students.

I read about supervising SOE, etc., but nowhere can I find the chief reason for year around programs — to provide students an opportunity to develop competencies in an occupational area, which, because of the seasonal nature of agriculture, can be attained at no other time.

If the traditional summer program is to survive, instruction must be as well planned, as well organized, and as well delivered as that which occurs during the regular school year.

The time is long gone when vocational agricultural education can justify existence of a summer program on the supervision of on-farm SOE, maintenance of facilities, tools, equipment, community service, public relations, livestock shows, judging contests, adult education, developing leadership qualities, civic activities, etc.

A final point, the non-vocational agriculture teachers will not continue to support paid summer employment for the purpose of professional improvement. While all of the activities mentioned above are worthy undertakings, they

...foundation necessary to justify ...instructional programs.

...disappointed that none of the authors mentioned ...organized instructional program or a cooper- ...experience in off-farm agriculture.

...preserve year around programs, we need new models for delivery of the summer instructional program in agriculture.

The 1950's model will not serve the 1980's . . .

Paul M. Day
State Supervisor
Agricultural Education
Minnesota State Department of Education

Computer Assisted Instruction in Agricultural Education

By C. JORDAN HUDSON
Editor's Note: Mr. Hudson is Assistant Professor of Agricultural Education at Virginia State University, Petersburg.

...you considered the uses that ...made of the computer? Are you ...ready to assist the young and adult ...with their computer-assisted ...operations? Are you familiar ...what is available for your stu- ...to use on their home computers? ...as microcomputers approach the ...of less than $1000, many will be ...in the homes of students.

...the increasing availability of ...more and more schools and ...are able to introduce the com- ...to a substantial number of stu- ...dents. If it is available to us, we should ...using it as one of our techniques of ...teaching. If we don't have it, we should ...be asking why.

The Impact of Computers

...see the computer as taking ...the factual teaching, thus giving ...the teacher and student more time for ...character development, practical exer- ...cises, and creativity. Others see a ...danger of mechanized schools with ...teachers who are addicted to the com- ...puter. Both of these views are probably ...exaggerated. In many schools the im- ...pact is relatively minor. Some teachers ...use it extensively and wisely as one of ...the available teaching aids. Others ...prefer not to use it and rely on old ...methodology.

...Why should you consider using the ...computer in your teaching program? ...Clearly, any activity that helps you to ...be more effective and efficient, and en- ...hances student learning, is beneficial. ...Also, agriculture is becoming more and ...more automated with decisions being made by information fed into a computer. If this is what is being used, shouldn't we have a basic knowledge of how to use it?

You do not have to be a computer operator or programmer to use a computer. However, knowing how to type will give you speed in the operation of it. You simply type in the code to a lesson and it will guide you with questions, prompting information, and responding to right and wrong answers. Furthermore, programs (for use on the computer) are available which teach you how to use the computer in many different ways. Once you become involved, you like many other people, will start developing software (the directions which make the computer operate).

The ability of the computer to respond does not mean that it can "think" on its own. It has to be programmed to make appropriate responses. This means that you, the teacher, or a "canned program" (one developed by someone else) must provide the computer with "prompts" so that it will know what to do when the student responds. These prompts, to the student, appear to be the computer talking. The student actually thinks he or she is talking to the computer.

As many teachers are finding, the machines and the software are oriented toward the novice who has little or no programming experience. They find the computers easy to operate with such programming languages as BASIC, yet flexible enough to satisfy the advanced students.

Ways the Computer Can be Used

The computer is used in a variety of ways, ranging from simple drills to aiding in building complex ecological models which show results graphically. Other uses include storage of information, simulation, tutoring, and games.

Drill and Practice. This has been extensively applied to math instruction. The fundamental purpose is to rehearse for more automatic student recall or recognition of certain aspects of the ideas previously taught. This type of program does not usually comment on incorrect answers. Problems can be set up randomly with immediate correction of answers, or answers can be obtained on another program at a later time.

All of us have students who need additional drill and practice in all teaching areas. Those who perform poorly could be given additional problems to solve in a weak subject area. The drill and practice could be as simple as a set of randomly selected questions. The

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Computer Assisted Instruction In Agricultural Education

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gifted student could use these same questions to prepare for a test or exam. A student who missed a test could make it up through use of the same program.

Tutoring. Tutorial instruction is generally used to review ideas which are not comprehended by the student. This type of computer program attempts to simulate a tutor as it introduces, explains, gives hints and examples, asks questions, evaluates answers, diagnoses difficulties, provides reinforcement and feedback, and selects appropriate placement of the student into subsequent lessons based on achievement level. The user feels a sense of participation since the responses from the computer are instantaneous and in plain English.

Tutorial programs have been prepared which assist the student in solving problems on work, power, torque, and horsepower. Similar programs are being developed in many areas of agricultural education. The big drawback is that it takes time to develop such a program. Once developed it can be used over and over.

Simulation. In cases where a pattern of behavior can be recognized, the computer program is used to simulate a real situation. It can act out all the parts of a problem in detail, introduce randomly selected values and events, and predict the results of a particular series of decisions. It allows the user to study subject matter not otherwise possible due to limited facilities. The operator is able to experiment in the manipulation of variables that are difficult or dangerous to assess in the natural situation. Long time events can be studied in a short period of time. Simulations greatly extend the range of education, broadening educational experiences considerably.

Simulation can be effectively used in the area of farm management. Any area where variables can be changed, lends itself to computer simulation. One such program on the market today is named **"Complete."** This program enables the student to plan an investigation and carry it out without the long delay usually associated with growth experiments. It includes the following: (1) simulated growth mixture — study of the interaction of any two kinds of plants (barley, oats, tall peas, dwarf peas, etc.) at different planting densities; (2) interaction below the ground — interaction of subterranean clover and rye-grass to show how conditions in the soil can affect the balance between two species; (3) direct plant interaction — shows the effects of plant competition on other plants; (4) effects of crowding on plant growth — this involves using the laboratory in conjunction with the computer.

Games. Many of you probably have this type of computer in your home. Games have been found to motivate students, teach logic, and stimulate learning. There are simulations featuring competitive settings where one or more students can play.

Games as well as simulations could be used by those students with limited supervised occupational experience programs. They could be used to give the students an opportunity to apply their knowledge of practices discussed in the classroom.

Testing. The computer can be programmed to serve as a test generator and administrator. Each student can be tested to his/her maximum ability with the computer determining the number and difficulty of items.

Recording Data. Transferring individual student records from junior high to senior high school seems to be a problem in many school systems. The computer can be used for storage and retrieval of this data. It has an extensive memory capability, it is easy to get the information once it is stored, it has the ability to cross-reference, and it is easy to up-date its memory file.

As we advance in skill development through competency based instruction, this type of equipment will be essential to keep track of the competency level of each student! When a student transfers to another school system, this information could follow quickly to the guidance counselor. Reports of student progress and performance can also be obtained from its extensive storage capability.

Teachers in the same system can share in the development and modification of computer instructional material. Students receive more individual attention and their education[illegible] ence is enriched through assisted instruction. The [illegible] be modified to fit the [illegible] can also be used to assist [illegible] choosing the college to attend.

Cost

We are in a time of rapidly computer prices. A large [illegible] sive computer system offering trative and instructional [illegible] cost several hundred thousand per year to rent. Yet a [illegible] can cost under a thousand [illegible] purchase. This may well be a [illegible] vestment for the vocational [illegible] ment to share. In fact, you might to purchase a microcomputer [illegible] Federal and state funds.

As the prices drop, more and computer systems will be [illegible] homes. As home entertainment ters, they will be capable of learning programs, budgeting grams and information retrieval cations. Much of this equipment include personal communication devices so that students can talk understood, causing it to be more responsive.

Moving Into The Computer World

Today, computers play a major in everyone's life. Students will ciate being able to understand and lize them effectively upon graduation regardless of their field of endeavor.

It must be remembered that the of computers is only one technique our multi-faceted curriculum methodology. It is neither a replacement for the teacher nor a panacea educational problems. Most teachers are looking for new and better ways stimulating learning. Computer assisted instruction will give better the experiences and learning situations that can be provided.

For those individuals who have access to computers, there is a variety programs and applications for educational use. Who decides what new program to develop or purchase? Should we deal with only the most effective programs, or should we encourage variety and experimentation? The ease with which a computer can be used courages us to try what is available adapt it to our needs.

ARTICLE

Agricultural Education Curricula In The Middle School

By Carl L. Rexrode

Editor's Note: Mr. Rexrode is an instructor of agricultural education at John W. Wayland Intermediate School, Bridgewater, Virginia.

Agricultural education is a dynamic [illegible] for students in grades 7 through 12 in the public schools of the United States. Agricultural education is offered in Virginia to 7th and 8th graders entitled Exploratory Agriculture, and Agricultural Science and Mechanics I. Exploratory agriculture classes for 7th graders may be from six weeks to eighteen weeks in duration, depending upon the local school. The Agricultural Science and Mechanics course is offered for thirty-six weeks in length. Students in this class may become members of the FFA. Members of [illegible] have varying opinions of the agricultural education curriculum in the middle school.

Curriculum Defined

What does the word "curriculum" mean? The answer to that question determines the direction of study in finding opinions toward the agriculture curriculum in the middle school. One educator gives a precise definition of curriculum as a systematic group of courses required for graduation. A second definition of curriculum is the organized experiences that a student has under the guidance of a school.[1] Another source describes the curriculum as what happens to children in school as a result of what teachers do.[2] Perhaps it is best for this paper to define the agricultural education curriculum in the middle school as the organized experiences that 7th and 8th grade students have under the guidance of the agriculture teacher.

Planning the Middle School Curriculum

The middle school is the school between elementary school and high school. Some middle schools are composed of grades 6 through 8. Others have 7th and 8th grades. And others have the 8th and 9th grades. Yet, other middle schools have grades 6 through [illegible]. There are different names used for this school, depending upon the person referring to the school and what that person conceives the name is of the school with those grades. Three different names for the schools between elementary and secondary education are used: middle school, intermediate school, and junior high school. This report shall use the term, middle school.

In order to plan experiences for students in the middle school, a person needs to reflect upon the students' past experiences in elementary school. The relationship of the middle school experiences to the high school activities need to be understood. In planning a middle school curriculum the teacher needs to have cooperation with elementary, middle, and secondary school staff. One source states that "having to think, act, and communicate with both elementary and secondary levels makes the task difficult for the professional staff members found in the middle **if** adequate leadership roles are **not** established, **if** people are **not** involved in cooperative planning, **if** decision-making and being responsible for the decision is **not** experienced, and **if** the total planning process alienates any group-elementary, middle, secondary."[3]

The Logansport (Indiana) Community School used a comprehensive needs assessment to plan curriculum. The Phi Delta Kappa needs assessment design was used, including participation by members of the community, the districts' professional staff, and students from the 11th and 12th grades. A curriculum planning council was formed to plan strategies. The top three priority goals were assessed as: (1) develop skills in reading, writing, speaking and listening: (2) gain a general education: and (3) develop good character and self-respect.[4] The agricultural education curriculum in the middle school probably needs to consider the individual school philosophy.

The Agricultural Education Curriculum

The agricultural education curriculum is both prevocational and vocational. Exploratory agriculture classes are described as prevocational.[5] Agricultural Science and Mechanics classes are described as introductory and exploratory in nature.[6]

One person states that the success of exploratory agriculture programs depends on the degree to which the students are permitted to explore and experience the real work. These exploratory experiences should relate directly to agricultural careers in the local community. The source cites suggestions from the U.S. Office of Education for exploratory activities as grouped into major career classifications. The six major career classifications in agriculture were described as agricultural supplies and services, agricultural mechanics, agricultural production, horticulture, agricultural products processing and marketing, and natural resources and forestry.[7]

Appomattox County (Virginia) Middle School teaches exploratory agriculture to 7th graders. The course is designed for 90 teaching periods. The exploratory class has the major learning areas of orientation, leadership training, agricultural mechanics, animal science, agricultural machinery, plant science, resource conservation, ornamental horticulture, and agricultural resources.[8]

During classes in Agricultural Science and Mechanics, students are given experiences using basic principles of the sciences, mathematics, and economics as applied to the agricultural situation. About half of the course is

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devoted to agricultural mechanics. One source lists the major learning areas in Agriculture Science and Mechanics as agricultural orientation, supervised experience program, agricultural mechanics, principles of plant science, rural and urban living, leadership training, and resource conservation.[9] The student may receive personal guidance and counseling which will help him/her select the advanced course leading to entry employment in an agricultural occupation.

The FFA is described as an integral part of curriculum of vocational agriculture. Members develop personal leadership by taking part in the conduct of meetings, speaking in public, participating in contests based on occupational skills, earning awards and recognition, and becoming involved in cooperative efforts and community development. The FFA offers the opportunity for students to become productive citizens in our democracy. The specific aims of FFA have been designed to develop the student in areas of leadership, citizenship, character, scholarship, improved agriculture, cooperation, service, thrift, recreation, and patriotism.[10]

The Teacher

What are the occupational tasks of the agriculture teacher? One source of information lists seven duty area for teachers. The duty areas are instruction, supervision, curriculum and program development, administration, evaluation, public relations, and professional activities. A survey lists the following nine activities as receiving highest importance for agricultural teacher occupational tasks: (1) develop good working relationship with administrators, faculty and staff: (2) maintain a facility which is conducive to learning: (3) attend school staff meetings: (4) keep abreast of current agricultural developments: (5) participate in school open house and/or parent-teacher conferences: (6) take a two week summer vacation: (7) teach high school classes on agricultural subjects: (8) require students to maintain a supervised experience program: (9) involve students in FFA activities.[11]

Summary

In this article, information from a number of sources has been summarized. Curriculum has been defined. Information has been supplied for planning the middle school curriculum. The agricultural education curriculum for the middle school has been explained. Important responsibilities have been listed for the vocational agriculture teacher.

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BOOK REVIEW

Dairy Farm Management, by Thomas Quinn. Delmar Publishers: Albany, New York, 646 pages, $8.00/$6.00 school discount, Instructor's Guide, 115 pp.

This new text provides an introductory treatment in the area of dairy farm production and management. Numerous pictures and drawings highlight points of discussion. The book is based on dairy production as a commercial farm enterprise.

The text is divided into fifty teaching units that make up its ten major headings. The major headings include selection, breeding, replacements, milking, milk handling, records, disease, housing and feeding. Each teaching unit contains suggested student activities, student self-evaluation, review questions, and a list of advanced student projects. The text has a companion Instructors' guide, 115 pages, which contains a pre-test and comprehensive post-test, a source list of supplemental teaching aids, 26 overhead transparency masters, answers to the unit review questions in the text, and address information of dairy associations.

The book's format, together with quality content, makes Dairy Farm Management a most valuable teacher resource. The author of this book review, as a former teacher of vocational agriculture in a dairy production region, highly recommends this text for consideration by teachers in similar regions. Teachers who have a few students interested in dairy production should find this book useful as a self-instruction guide.

The author, Thomas Quinn, is currently Vocational Agriculture Instructor in the Long Prairie School District, Long Prairie, Minnesota. He taught dairy production at Long Prairie for nine years prior to completing his book.

Dairy science technology advances have made recent sources of dairy education material a necessity for the up-to-date teacher. This text provides an up-to-date introduction to all phases of dairy production. Special attention was given to the scientific approach to feeding, breeding, and bad health practices. A separate unit is devoted to control of mastitis.

The book would make an excellent high school or introductory college text. It should be easy to read and understand for beginning students interested in dairy production. High school vocational agriculture teachers will find the teaching aids in the instructor's guide quite valuable for classroom use.

James W. Legacy
Agricultural Education
Southern Illinois University

FFA Convention Feature . . .

The 1980 annual Agricultural Career Show will feature 250 booths with exhibits related to agricultural careers. The show is one of the features of the 53rd National FFA Convention, November 11-13, 1980, in Kansas City, Missouri.

The purpose of the displays is to provide FFA members and advisors attending the National Convention a chance to become familiar with career opportunities. Exhibits will present new agricultural technology, job opportunities, education and training requirements, and educational materials in agricultural education.

Another feature of the exhibits is to allow FFA members and advisors the opportunity to talk on a one-to-one basis to representatives of agribusinesses, federal agencies, professional associations, and educational institutions.

NATIONAL AGRICULTURAL CAREER SHOW

Exhibits will be displayed in the H. Roe Bartle Exposition Hall, located adjacent to the Municipal Auditorium.

Additional information is available from George E. Verzagt, Show Manager, National FFA Center, P.O. Box 15159, Alexandria, VA 22309, telephone 703/360-3600.

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Stories in Pictures — Using Realia in Instruction

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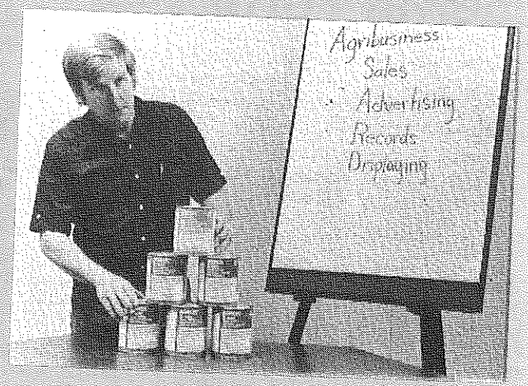

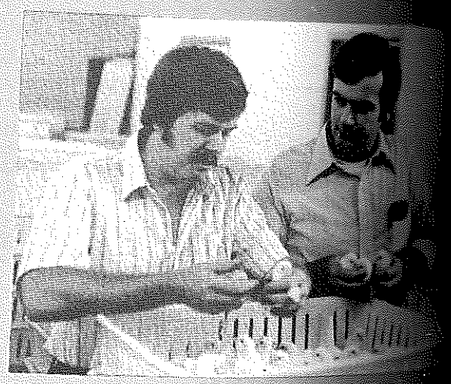

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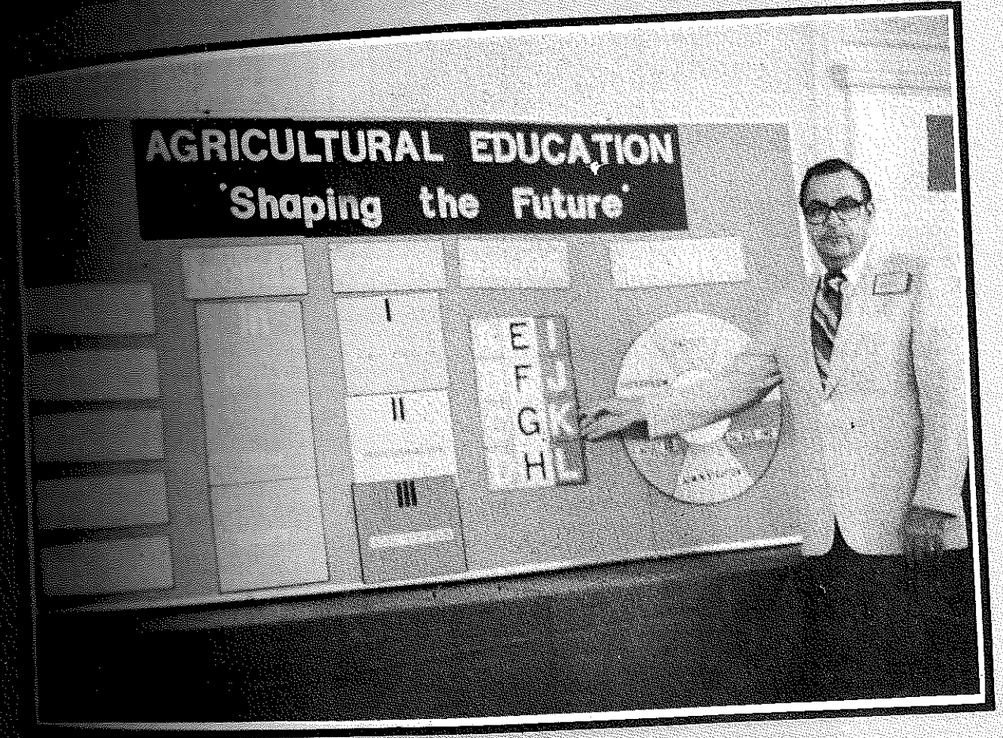

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