

# The Laboratory

JAMES L. DAVENPORT  
*Associate Professor of  
Agricultural Economics  
Arkansas State College  
State College, Arkansas*



*Now Associate Professor of Agricultural Economics at Arkansas State College, State College, Arkansas. Received the B.S. Degree in Agriculture from the University of Arkansas in 1950 and the M.S. Degree in Agricultural Economics from the University of Arkansas in 1954. Has taught at Arkansas State College since 1954. A former field representative for a Production Credit Association.*

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The laboratory may exist to serve a number of objectives, but this discussion will be limited to its part in education. The planning of the laboratory with regard to the equipment used and the personnel necessary to operate it will vary a great deal depending upon the particular discipline which it will serve. Then, too, there are such influences as finances. Some people seem to have adequate financial resources while others may have to substitute ingenuity and perseverance for much of the equipment. The particular likes and dislikes of the individual teacher who is responsible for the organization and operation may cause some variation. A quick glance over the list of laboratory equipment for some half dozen areas of agriculture, which was recommended by a former NACTA

Committee, indicates something of the range of equipment commonly used. (1) This wide range of specific items might suggest that this discussion be limited to problems common to several fields.

Through past experience society has developed a body of facts and principles upon which it relies for future progress. (2) Quite often it is difficult to bridge the gap between those facts and principles and present day activities. The laboratory serves a most important part in this difficult transition. It can never recreate all the problems the student will face in real life, but will so instill in him an understanding of the principles that he will be able to apply them to the solution of those problems regardless of in what form they might face him. In most cases, the laboratory will not produce a finished technician, but will simply ground him in the fundamental concepts.

Realistic problem situations should be set up if at all possible, with the results applicable to the segment of agriculture dealt with. Sufficient supervision should be given to make sure the student does not lose sight of the main purpose of the exercise. (3) Laboratory exercises should be made up with the same care one would use in preparing an open book examination. If the exercise contains questions, they should not merely call for repetition of information but should require thought about the principles involved. The primary concern of the student is often to follow directions carefully, cook book style, so as to achieve some result which the manual says he should get. (4) Having the student "work through" or think through a problem on his own accomplishes far more than to have him "guided" or "brainwashed" through the situation without ever understanding the real object of it all. In fact, it seems that students sometimes need to make a few mistakes on their own before they become receptive to some things, no matter how sound the principle is in the first place.

Students should not become dependent upon someone to supply the answers for the questions or problems. Some encouragement or help may be given, but it should be done so as not to make the answer obvious to the student without some thought on his part. This is often difficult because the overloaded teacher, with too few hours in the day to spread over the many jobs, will take the quick way out and supply the answer rather than spend the necessary time to search with the student for the solution.

The varied academic background of students as well as their differing educational objectives quite

often complicate the problem of the laboratory teacher. Many times the student enrollment in a department is so small that the department cannot afford to erect barriers by having all the prerequisites in order to have a homogenous group. This may call for some reorganization of courses by the teacher faced with this situation. The ideal circumstances would no doubt be one in which all the students had similar backgrounds and objectives. This would make the teacher's job easier and result in a better total comprehension of the material by the students. In the meantime, until this ideal is achieved, the quality of our educational program might be raised if our more experienced teachers conducted not only the formal lectures but the laboratory sessions as well. Present practice in many cases puts the experienced professor in the lecture hall, where material to a considerable degree is "canned" and a minimum of time is allowed for question and discussion. The student assistant then is largely responsible for the laboratory. These assistants usually are our top students and in most cases they know the answers well, but they sometimes lack the experience necessary to help the student "search" for the solutions. Our total effort might be maximized if the assistant were really used to release the teacher from janitorial duties so that he is able to teach during the laboratory period. (5)

In the so called "skills courses" the laboratory, if it be a separate function, is seldom neglected to any considerable degree because the course consists primarily of this. More often it is a situation where the laboratory is a minor function, at least as far as time involved in the whole course is concerned. In such a case as this we often polish up the lecture part of the course and let the laboratory follow haphazardly along, many times without the proper coordination between the course and laboratory. This should not be taken as an indictment of the crops people because we all know that the seasons and semesters just don't coincide. It would be too expensive to duplicate all necessary conditions in the greenhouse at the proper time. The animal husbandry people no doubt have their share of problems with regard to having the different classes of stock available at the proper stage of development to coincide with the needs of the various courses. Even though these seldom work out entirely satisfactory, we should not despair of ever making improvement. Sometimes a little forethought and planning will make for better coordination and also greatly improve the effectiveness of the overall course.

No discussion of "the laboratory" in agricultural education would be complete without mention of the farm itself, which is probably the most important laboratory we have. The use of the college farm in serving as a laboratory for the teaching of agriculture classes was well covered by Professor Ed D. Moore writing in a previous issue of the NACTA Journal. (6) Due to the fact that quantitative measure of the returns to the farm as a laboratory are almost impossible to make, too many people are prone to view the farm and measure it in terms of whether it had a profit or a loss last year. Many other facilities have returns which are intangible so there should

be no reason why farm facilities have to be justified as to whether they "pay their way".

It seems apparent that the ability to think and use information which has been given to the student is just as important as the information was in the first place. We have too long overlooked the importance of the laboratory in bridging this gap between the theoretical and the practical.

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# TV Classes For Agriculture

by

F. E. BECKETT

*Louisiana Tech*

Television is arousing new interest in "non-live" teaching. The possibility exists that television may become a permanent part of the educational scene. The "non-live" teaching movement failed once in a similar medium, the 16mm film. Perhaps it would be more accurate to say that it was killed by episodes such as the one described here.

Shortly after the bell rang, the teacher entered the classroom. He had a film can in his hand. Obviously, he planned to show a movie. He fumbled with the projector about ten minutes and finally had the film threaded and ready to go. He turned the machine on immediately and there were loud cracking sounds. The film was threaded improperly. After another 5 minutes he turned the projector on and the movie began. The film, produced by a manufacturer of farm machinery, was about hydraulic systems. It carried a great deal of hardsell advertising and very little technical information. The 25-minute show finally ended. A sizeable part of the class was asleep. The instructor asked, "Are there any questions?" There were no questions. Only five minutes remained in the period so the class was dismissed. And so, ended another crime against education committed in the name of visual aids.

"Non-live" teaching can be an excellent educational tool. In many areas it is equal to live teaching. In some, it is superior. The behavior of protozoa can be shown to

a whole class through film. The concept of the internal combustion engine can be depicted through animation in a manner that is superior to any other method of presenting the information.

The development of a chick embryo can be condensed into a very short time and can be shown vividly to a class. It would be impossible to do this through incubation in the classroom.

If a film or TV tape is to be used by many people, great time, effort, and expense can be devoted to its production. Because of the cost involved, quantity production of high quality TV tapes or movies must have the support of a large group of colleges and universities.

Everyone who has passed through our school system has been exposed to good and bad films. In recent years there has been a tremendous interest in classroom television. Many universities and colleges have closed circuit television available and are actively using it in teaching courses. One junior college has presented its entire course offerings on television (1). Considerable money is being spent in developing lessons for use with television apparatus. Some professional groups have made great efforts in preparing visual aids materials for use at various educational levels (2). In agriculture the effort has

been small. Agriculture is in danger of falling behind other disciplines if it does not develop these aids to their full potential. There is an urgent need for group efforts directed toward production of germane, high quality visual aids for college agriculture. There is a great need for an information service that will enable a teacher to evaluate those aids that may exist already.

NACTA may be the agency that should sponsor these efforts. A possible procedure for making information available about materials already in existence follows:

1. Select courses that are fairly uniform over the United States.
2. Catalogue and review all films and TV tapes that are available for possible use in these courses. A review stating the strong and weak points of each visual aid should be published in the NACTA Journal.

A program for bringing new materials into existence should be formulated. The actions outlined below could be a beginning.

1. Select a course or courses to be developed.
2. Study materials that are available and determine areas that need new materials.