ledge in their fields. A faculty member approaching these visits on a positive note, willing to learn, can add a whole new dimension to his/her classroom and laboratory instruction. A visitation report is turned in to the POP Office by the instructor-counselor on his/her return from a student visit.

Upon completion of the 12 weeks a grade is established by the POP Coorinator and instructor-counselor based on the three employer and three student reports.

Any cooperative internship education program must have three essentials if it is to be successful. In addition to an organized plan for development and student involvement, such a program must have the following:

(1) An administration that believes in the worth of the program and supports and defends the program against criticism. It must be willing to commit financial resources necessary for success.

(2) A faculty supportive of the work experience program and willing to accept the responsibilities involved in directing students, providing advice, assistance in planning, supervision, and evaluation.

(3) Employers willing to provide a real educational experience for students. Such employers must be willing to go one step further and become teachers as well as employers.

Fortunately, all three of these essentials are present at the University of Minnesota Technical College, Waseca, and can be credited with making the internship and cooperative education program here a successful reality.

A complete Faculty-Student Handbook (developed by Peter A. Fog, POP Coordinator, and Duane A. Kaas, Assistant POP Coordinator) is available to anyone who desires more information. Samples of all forms and procedures in developing a work experience program are included in the handbook. For further details write Peter A. Fog, Coordinator, Pre-Occupational Preparation, University of Minnesota Technical College, Waseca, MN 56093.

Reference

Fog, Peter A. and Kaas, Duane A. 1978. *Student-Faculty Handbook for Pre-Occupational Preparation*. pp. 1.

Fog, Peter A. and Kaas, Duane A. 1976. *Pre-Occupational Preparation Film*.

IDEA SHARING SESSION

NACTA Conference

Project 120: A Public Relations Program Oriented To Prospective Agriculture Students

Robert L. Beck
Associate Professor of Agricultural Economics

and

Mike Richey
Director of Student Relations, College of Agriculture
University of Kentucky

Introduction

The best public relations for a product or service is a satisfied user. Based upon this premise, the University of Kentucky College of Agriculture in 1970 initiated "Project 120" — appropriately titled because of the 120 counties in the state. Project 120 is a public relations program which allows students in the college to visit their home high school and speak with students interested in pursuing agriculture as a career. Discussions pertaining to job opportunities in agriculture, student life at the university, and the academic and extracurricular programs offered by the College of Agriculture are held. The uniqueness of the program is its dependence on student input. Project 120 is an activity sponsored by the Agricultural Student Council and is coordinated through the Office of the College of Agriculture's Associate Dean for Instruction.

The basic objectives of the program are as follows:

1. Encourage enrollment in the College of Agriculture
2. Assist prospective students with enrollment, housing, and financial aid procedures
3. Inform students about careers in agriculture
4. Involve College of Agriculture students in a public relations activity.

How the Program Works

Planning and preparation for Project 120 starts early in the fall semester. A "fact sheet" is compiled with specific information about the university, costs, housing, and financial assistance. General information about the College of Agriculture's programs, farms, etc. is also provided. Agricultural students participating in Project 120 are required to attend a training session in early December at which time the fact sheet is reviewed and other information is presented. This aspect of the program is coordinated through the Associate Dean for Instruction's Office by the Director of Student Relations.

Immediately following the training session, the Director of Student Relations sends a letter to the high school teacher(s) designated by the student explaining the purpose of the program and indicating that during the university's semester break one of their former students would like to speak with students interested in pursuing a career in agriculture. The teachers are informed that the designated student will contact them regarding the visit and make further arrangements. Students are permitted to visit only their home school and to contact a teacher that they know personally.

When students return home for the semester break, they contact their school and finalize plans for the visit. The visit may involve speaking to an entire class or holding a "rap session" if only a few students are interested. Students are encouraged to keep their presentation informal and informative. Prospective students are asked to fill out an information card indicating areas of interest.

The students' participation in the program is completed when a report of each visit is made upon their return to campus. The Director of Student Relations then follows up by providing additional information to prospective students on their specific areas of interest.

Evaluation of the Program

In recent years, an average of 35 high schools have annually been visited by College of Agriculture students. It is difficult to determine how many students decided to enter the University of Kentucky as a direct result of Project 120. However, comments from teachers, counselors, and others have indicated appreciation for this approach to informing their students about agricultural careers and college life. Furthermore, Project 120 participants have been well pleased with their efforts and many desire to return to their high schools the next year. Without question, Project 120 has proven to be a valuable public relations project of the College of Agriculture.

An Alternative Approach To The Diploma In Agriculture

John S. Gardiner,
Kemptville College of
Agricultural Technology

Since 1978 the Ontario Ministry of Agriculture and Food has made available an independent study program leading to the Ontario Diploma in Agriculture (ODA). This program, an alternative to the conventional programs offered at the 2-year colleges of agricultural technology in Ontario, is designed for the mature student who for a variety of reasons is unable to participate in a residential program.

Admission to the Program

The minimum academic requirement to the ODA is secondary school graduation (or equivalent) **OR** mature student status (19 years of age and out of school for at least one year). Advanced standing may be granted through transfer of credit and challenge examinations.

Fees range between $50 and $85 per course. The program is open to qualifying non residents of Ontario at a slightly higher fee schedule.

Method of Instruction

Course materials with study assignments are mailed to the student who in turn submits his/her completed assignments for marking and comments by a specialist in the subject area.

Each course is a complete study package. Several are presented as multimedia packages each containing a graphically illustrated text, filmstrips, filmstrip viewers, and an audio overview of the filmstrips presented in audio magnetic cassette form.

Options in the Program

The ODA program contains a combination of required and elective courses. Required courses must be completed by all students. The range of elective subjects makes it possible for students to specialize in one of the following areas of interest: Animal Production, Crop Production, and General Agriculture.

Some Course Titles

Agricultural Marketing	Introductory Agricultural Economics
Agricultural Mathematics	Introductory Crops
Basic Communications	Plant Nutrition
Beef Cow-Calf Production	Pork Production
Beef Feedlot	Principles and Practices of Soil Science
Dairy Animal Health	Principles of Animal Nutrition
Dairy Goat Production	Soybean Production
Farm Income Tax	Specialized Corn Production
Farm Financial Management	Vegetable Production
Forages	

Diploma Requirements

1. Successful completion of 45 credits with a minimum of 15 courses.
2. Successful completion of three general knowledge examinations.
3. Satisfactory completion of an approved project accompanied by a 10,000 word report.
4. A minimum of 12 months documented agricultural experience.

Program Administration

This program is administered by Prof. C. E. McNinch, Chairman, Independent Study Division, University School of Part-Time Studies and Continuing Education, University of Guelph, Guelph, Ont., Canada N1G 2W1.

Professional Women In Ag Carrers

Ann Johnson
College of Agriculture
University of Nebraska

How many here have been to Mexico? How many of you have had an extended stay in a foreign country?

For just a few minutes, let us assume that we have an unlimited grant to study for a year in some foreign country. What are some of the things we would do to prepare for this experience so we would gain as much from this opportunity as humanly possible? I think

- — we would want to know how to find a reputable guide for our early weeks in this unfamiliar setting;
- — we would try to learn what kinds of behavior were considered polite and what kinds would be considered offensive. In other words, we would need to learn the "rules of the game" for that particular culture;
- — we would expect to have some difficulties; consequently, we would do our best to anticipate those difficulties and figure out ways of coping with them.

What does all of this have to do with the topic of my presentation? I suggest that any young woman graduate who seeks to be a professional in an agricultural field or in the world of business faces many problems similar to those any one of us would face if we were going into foreign territory.

Statement of the Problem

The College of Agriculture at the University of Nebraska is concerned about its women graduates and about what we are doing to prepare them for the "real world." We have experienced a marked increase in the number of female students in recent years. Our female enrollment has stabilized at approximately 20 percent. I assume that much the same is true for the institutions you represent.

In recent years we have held an employment seminar for juniors and seniors in our college. It became increasingly clear that our women students had some special problems — and some special advantages — as they went into the job market. This past semester we experimented with a one-hour course offering professional training in a class called Professional Women in Ag Careers. I see this class as being much like the senior seminars many of our departments have to prepare their departmental majors for assuming professional responsibilities once they are on the job.

This morning I would like to look at three aspects of the problem our women graduates face in their efforts to become professionals in an agricultural career:

1. The scarcity of female role models,
2. The social conditioning young women traditionally receive in our culture, and
3. Their unfamiliarity with the male culture system.

Scarcity of Female Role Models

The most obvious problem our women graduates face is the lack of female role models as professionals in the agricultural field. How many professional women do you know? Right off the bat, how many of you could name a dozen professional women in agriculture? Even though there certainly are more professional women today than at the time I was graduated from college, they are relatively scarce. I judge that the average woman student has very limited access to professional women. In contrast, our men students do not lack male role models.

I felt this was the Number One issue we needed to face in our class. As you can see from the handout (1) we brought in eight role models as guest speakers for our class; (2) we sponsored a half-day women's career development workshop conducted by Sharon Crain, a well-known authority and author in this field; and (3) we asked each student to interview a professional woman and turn in a written report on that interview. This report on the interview with a professional woman was judged the most valuable of the three written assignments in the course.

Social Conditioning

Dr. Janet Krause, my team teacher in this course and a counselor at the University's Counseling Center, sees socialization as the major problem women face in their efforts to become professionals in a traditionally male-dominated field.

If you have a family, think about how differently you raise your sons from the way you raise your daughters. In the case of your sons, my guess is that you have been giving them signals from the time they entered kindergarten that they needed to think about and to prepare for a **lifetime** career. Did you give your daughters the same set of signals? If your answer is "yes," you are very unusual; also, if your answer is "yes," it is a pretty safe bet that you have all daughters in your family.

The socialization process for most little girls in our society tells them they are not expected to have a career per se; today they are going to be expected to work most of their adult years, but they are not expected to have a career. Furthermore, as Sharon Crain puts it, we women are trained to be waiters:

> We wait to be asked to the prom;
> We wait to be asked to be married;
> We wait to be "discovered" for raises in pay and for promotions.

Unfamiliarity with Male Culture System

Closely related to the problem of socialization, is the utter ignorance most women have of the male culture system. Any woman who hopes to succeed in business or as a professional in an ag career needs to realize that she is moving into foreign territory; that foreign territory is the male culture which dominates the way business is organized and run. The aspiring business woman needs to understand sports, the military, and the informal male support system.

The woman professional is well advised to be knowledgeable about the accomplishments of the sports teams her male associates are interested in. She is even better advised to become adept at some sport: tennis, running, swimming. Better yet, she ought to have experience in a team sport. Men seem to find it easier than women do to work with individuals whom they do not particularly like; several writers in this area attribute that skill to the team sports experience.

Also men grow up learning the rules of the game and learning to decode the unwritten rules of the game. I am told that young male executives are much more adept at identifying these unwritten rules than women are. Many women are not even aware that they ought to be doing this sort of thing.

The first thing an ambitious young male executive does is to analyze what is rewarded in his company. The typical conscientious female professional works like a dog to do a good job and then waits to be "discovered." The aspiring young male executive typically finds a coach or mentor to guide him through the intricate maze that leads to the top. As I see it, it is extremely important for a woman professional to find a mentor who will guide her and coach her. Incidentally, her best bet for a mentor is a man with daughters who have career ambitions.

In addition to sports, the aspiring woman professional needs to have some knowledge of military struc-

ture because most of today's corporate officers served in WW II — and in a sense they see company organization in military terms. Men with military experience understand the difference between line and staff functions; furthermore, they know that most promotions leading to the top are from line positions. Many women do not understand this distinction between line and staff function or even that it is important to know the difference. It is not unusual for a woman professional to choose to specialize in some staff function — let's say personnel — without ever realizing there are very definite career limitations that go with such a decision. If I have a female student who wants a management career but doesn't know whether to go into personnel or sales, I encourage her to choose sales. In addition to sales having the advantages that go with a line position, in this area the female is more likely to be rewarded in direct proportion to her effort than in any other aspect of the business.

Conclusion

I consider what I have been talking about as one of the **frontiers** in education in agriculture. If we are concerned about **all** of our graduates, as I think we are, we need to address the special problems women face.

We need to prepare our women graduates for the "stranger in a foreign land" role in which they may find themselves. In time, they are sure to become guides and mentors to other young professionals entering the field.

Professional Women in Ag Careers
University of Nebraska-Lincoln

Course Topics

Career goals and life goals
Career opportunities in the federal government (guest speaker)
More on life goals
Assignments for the semester
Organizational structure (guest speaker)
    Promotions
    Line vs. staff positions
Speech patterns and body language
Risk taking (guest speaker)
    Initiating action
    Taking control of situations
Mentoring
    How to find a mentor
Networking (guest speaker)
    Developing a support system
Androgyny
Stress
    Recognition of
    How to cope
Combining family and career
(2 hour session)
    (Panel of speakers who have followed differing patterns in combining marriage and a career)
Illegal questions in the job interview
Appropriate dress for the professional (guest speaker)
Evaluation

1980 Reading List
Professional Women in Ag Careers

Bird, Caroline. *The Two Paycheck Marriage.* New York: Rawson, Wade Publishers, Inc. 1979.

Ms. Bird talked with hundreds of women, men, and children and analyzed polls, surveys, biographies, and the findings of behavioral scientists to bring American couples a comprehensive report on how two-career couples cope with the housework, the money they earn, the biological deadline on childbering — and each other. This book documents the sweeping changes this phenomenon is causing in our society, but also shows, through case histories and extensive interviews, how contemporary women and men are coping with this change in their personal lives.

Crain, Sharie. *Taking Stock. A Woman's Guide to Corporate Success.* Chicago: Henry Regnery Company, 1977.

Very readable book by manager of Women's Career Development for international Harvester. Especially good sections on: fields of maximum opportunity for women, career planning, interviewing, moving up.

Harragan, Betty Lehan. *Games Mother Never Taught You.* New York: Rawson Associates Publishers, Inc. 1977.

One of the strongest statements on corporate gamesmanship. Harragan encourages the reader to learn the game, play it with skill, and enjoy the process.

Hennig, Margaret and Anne Jardin. *The Managerial Woman.* Garden City, New York: Anchor Press/Doubleday, 1977.

Study of male and female attitudinal patterns of difference regarding careers, profile of twenty-five powerful women managers, implications for women today. Weak in the "how-to" area but very useful in describing difference in orientation between men and women. Authors on faculty at Harvard Business School at time of writing.

King, David and Karen Levine. *The Best Way in the World for a Woman to Make Money.* New York: Warner Books, Inc. 1979.

The author runs a very successful sales and marketing school for women in New York City. Betty Lehan Harragan (author of *Games Mother Never Taught You)* says regarding this book: "Here, at last, is the 'missing link' in career guides for women — a book that exposes the pipeline to upper management and leads women unerringly toward its entrance."

Molloy, John T. *The Woman's Dress for Success Book.* Chicago: Follett Publishing Co., 1977.

Excellent book for young woman who wants to dress like professional staff rather than clerical personnel. Tends to reflect Eastern establishment tastes.

A Picture is Worth a Thousand Words

Paul E. Sanford
Department of Animal Sciences and Industry
Kansas State University, Manhattan

In our beginning Poultry Science course, which supplements the course Principles of Animal Science, I use lots of audio visual aids.

For example, when I am talking about class, breed, and variety of poultry and what we mean by these terms, I use 2x2 slides to illustrate characteristics of the Asiatic Class and point out the feathered shanks and toes. Next, I show a member of the Mediterrean Class and point out the non-feathered shanks and the White Earlobes. I talk about the American Class and point out how "Shape Makes The Breed." I illustrate the rectangular shape of the S. C. Rhode Island Red, the circular shape of the Wyandotte, and the oval shape of the Plymouth Rock.

When talking about crossbreeding, I show the slide of the Black Australorp male x the White Leghorn female that produces the F1, crossbred chicken.

As I discuss sex linkage, I use the slide showing that when one uses the New Hampshire male x the Barred Rock female, one can sex the baby chicks by down color.

In discussing nomenclature of the bird, I talk about characteristics of male and female plumage and how they differ. Then I'll use a slide of the Seabright Bantum to illustrate henny feathering.

As I discuss poultry nutrition and feeding, I use a series of slides to point out deficiency symptoms. For example, a deficiency of thiamine, riboflavin, ascorbic acid and a deficiency of the mineral manganese that causes perosis.

When we are discussing eggs, I illustrate what we mean by egg candling. I illustrate quality standards for shell eggs AA, A, B, C. We talk about the use of the Haugh Unit Calculator for evaluating the interior quality of eggs, so I use this slide. I use slides to illustrate the appearance of the 4 quality standards when the eggs are broken out, poached, and fried. I use this slide when talking about the classification of eggs. Class is determined by weight per dozen eggs. We discuss which size egg is the best buy. Remember egg weight is expressed as weight per one dozen eggs. Since one dozen large eggs weigh 24 ounces per dozen, that means 1½ pounds. Thus 60 cents/dozen = 40 cents/lb.

I try to defend eggs and show students what happens to growing rats if they are fed natural whole eggs as a source of protein as compared with using egg beaters as a source of protein. I let you make your own decision as to which source of protein you prefer to consume.

Program Planning and Delivery For the Individual Student

Eugene E. Trotter,
Assistant to the Director,
Institute of Agricultural Technology,
Michigan State University

Background

The Institute of Agricultural Technology at Michigan State University provides students with technical education in agriculture. The Institute offers 13 educational programs in the following agricultural areas: Dairy Production, Livestock Production, Crop Production, Fruit Production, Vegetable Production, Electrical Technology, Commercial Floriculture, Elevator and Farm Supply, Power Equipment Technology, Landscape and Nursery, Soil and Chemical Technology, Turfgrass Management, and Animal Technology.

With the exception of the Animal Technology Program, these programs are six terms in length. The graduate receives a certificate upon the successful completion of 80 term credits. A graduate of the Animal Technology Program receives a certificate at the end of seven terms after successfully completing 106 term credits.

The student comes to campus for fall and winter terms (September to mid-March) taking an average of 15 credits each term. During Spring and Summer terms, (mid-March to mid-September), the student is enrolled in 20 credits of off-campus Placement Training. To complete the certificate requirements, the student returns to campus for the fall and winter terms. Graduation is in mid-March, 18 months after the program begins.

Need To Be Flexible

Job preparation is the major reason students enroll in any instructional program. Agricultural Technology students desire preparation for a diversity of jobs.

Even more diverse are the backgrounds these students bring to any one program. Thus, the same education "funnel" will not effectively take all students from where they are upon enrolling to where they want to go upon graduation. Each student's knowledge and skills must be considered when planning an individual educational program.

Program Planning For The Individual

A self-assessment instrument can help both the student and academic advisor appraise what knowledge and skills the student possesses. For example, at the beginning of fall term, students enrolled in either the Fruit Production or Vegetable Production programs are asked to respond to a list of competency statements. This list contains knowledge and skills relevant to their respective production horticulture areas. Students are asked to use the following response scale:

1. Can do comfortably
2. Can do but uncomfortable
3. Can't do at all

Examples of competency statements are the following:

1. Take soil samples
2. Figure fertilizer requirements
3. Apply fertilizer to soil
4. Select disease resistant varieties
5. Determine the most economical sources of supplies
6. Plan a "pick-your-own" marketing system

The next step in this planning process involves industry leaders. Each student is asked to have a survey filled out by two leaders in his/her commodity industry. This survey and the one filled out by the student contain the same list of competencies. The only exception is the scale used. The industry representatives indicate the degree of importance for each competency using the following scale:

1.	Important	competence in performing is absolutely necessary for entry level upon graduation.
2.	Some importance	competence in performing has some influence or effect on entry level employment upon graduation.
3.	Not important	competence in performing has no effect on entry level employment upon graduation.

Any statement that receives a response of No. 3 (Can't do) from the student and receives a No. 1 response (Important) from both industry leaders becomes a priority learning activity for the student.

Program Delivery For The Individual

Competency statements in this educational plan are then used to structure the instructional delivery for the individual.

1. **Course Selection:** Each term a student is on campus, course selection is based on needs identified in the educational plan.
2. **Special Problem or Topic Content:** A research project topic can be based on the unique needs of the individual student.
3. **Placement Training:** There are three parties involved in the placement training or "hands' on" experience: the student, the employer, and the university supervisor. This list of com-

petency statements serves as an excellent communication device. The appropriate placement training setting can more effectively be identified based on the needs of the student. The placement supervisor can readily decide if he/she can help meet this student's needs prior to signing a placement training agreement. And, this list of competencies can give educational structure to the entire placement training experience. Employers tend to treat the student as a trainee, not just an employee, as they strive to achieve competence based on these statements.

4. **End of Program Assessment:** This educational plan affords the student and the academic advisor an effective means to appraise the professional competence of the student at the end of the 18 month program. The student may decide additional educational experiences are desired.
5. **Life-Long Education:** The academic advisor and the student have the opportunity to identify some possible needs that can be met in a life-long educational setting. The planning and delivery of these needs should be a joint venture between the office of resident instruction and that of the cooperative extension service.

End Result

For students to succeed on jobs, they must be able to perform specific tasks for their employers. This planning and delivery process communicates to students the competencies that will be required of them and their achievement progress throughout the program. Also, this process communicates more specifically the abilities of the prospective employee to the prospective employer. As an end result, the student is more adequately prepared for the job of his/her choice.

Committee Evaluation at A Technical College

Robert M. Collins
Professor and Assistant Provost for Administration, University of Minnesota Technical College, Waseca

The topic of committees has a high interest among college personnel. Concerns such as value, importance, number, productivity, wise use of time by individuals on committees, and other questions have long been discussed and debated.

Such concerns have been raised in comments at the University of Minnesota Technical College, Waseca. This two year coordinate campus of the University of Minnesota specializes in the preparation of students for semi-professional, midmanagement positions in the broad fields related to agriculture as well as in services to rural homes and communities. The college began in the fall of 1971. Enrollment for fall quarter, 1979 was 1111.

As an evaluation, the Committee on Committees sent questionnaires to the chairpersons only of the collegewide standing committees at the end of the 1977-78 college year. Collegewide standing committees are ongoing committees which continue to operate from year to year. The results of this survey were as follows based on 31 collegewide standing committees:

The committees met an average of 6.68 times during the year with a range from zero meetings (two committees) to 47.

Agendas were sent out before the meetings in 24 cases, five were not, and two chairpersons did not reply to this question.

Committee membership averaged 6.5 persons and ranged from four to twelve.

All 31 chairpersons thought the committee membership was neither too large nor too small but was the "right" size.

In answer to the question, "Do you feel your committee could be incorporated into or combined with another committee at UMW?" one replied yes, 28 replied no, and one answered with a question mark.

Twenty-nine chairpersons thought the classification of their committee as a campuswide committee was correct, but two persons dissented.

All 31 chairpersons answered yes to the question, "Do you feel your committee is necessary and should stay in operation?"

Twenty of 31 chairpersons amplified their answers to the survey questions with written comments.

The following year, a slightly different survey form was sent to all members of collegewide standing committees excluding the committee chairpersons and student members but including faculty, civil service, and bargaining personnel who were limited to membership on two standing committees. Included in this survey were 33 collegewide standing committees. Responses from the survey would indicate that six of the committees did not meet during 1978-79. Those are Grievance Committee for Academic Freedom and Responsibility, Food Service Advisory Committee, Institutional Research, Student Conduct Code, Health Service Advisory, and Recreational Sports Advisory.

One hundred forty-five survey forms were sent to specific individuals, with their name and the name of the specific committee right on the form. Only one returned form had the name of the committee and the individual removed.

The survey items were selected so that they could be completed without doing any checking. Such questions as, "How many times did this committee meet in 1978-79?" were not used since most persons would need to check on this, decide perhaps to do it later, and as a result possibly not complete and return the survey. The answers therefore are perceptions and opinions of those that filled out the individual survey forms. As a result some discrepancies can be found. For example, one person might indicate that a committee had not met during the year and not filled out the form while another respondent might fill out the form completely for that same committee.

Of the 145 surveys sent out, 122 were returned. Not every respondent completed every item in the survey so in no case do the item tabulations equal 122. Whether the

categories left blank were deliberate or inadvertant is not known.

A tabulation of responses to the seven items follows:

1. In 1978-79, this committee met (6) too often (68) optimum (34) too seldom. Ten indicated the committee did not meet.
2. Was agenda sent out before the meetings? (83) yes (18) no Eight indicated sometimes.
3. Committee membership was: (3) too large (99) optimum (4) too small
4. Average attendance was: (57) good (40) fair (9) poor
5. Do you feel this committee could be incorporated into or combined with another committee at UMW? (14) yes (98) no Two said "possibly."
6. Do you feel this committee classification is correct? (104) yes (5) no Four wrote in "questionable."
7. Do you feel this committee is necessary and should stay in operation? (107) yea (8) no One wrote in "questionable."

Forty-nine of the returned questionnaires contained written comments relating to the questions asked and the particular committee being evaluated.

From the written responses to the two surveys outlined above, collegewide standing committees at the University of Minnesota, Waseca, received a generally positive evaluation.

Testing Instructional Innovations

Robert R. Shrode
Professor of Animal Science,
University of Tennessee

Many so-called "tests" of the effectiveness of new instructional procedures have been conducted by comparing the final grades of one group of students with whom the procedure was not employed with those of another group with whom the procedure was employed and attributing the differences in group averages to the procedure, assuming the two groups to be equal in average learning potential at the outset and making no effort to determine whether the two groups really were or were not significantly different in average initial learning potential.

It is likely that any two groups of students will be different in average learning potential at the beginning of a course; but even if they are different in this respect, they can be used to test the effectiveness of a given instructional procedure by first adjusting final average grades to remove variation attributable to regression on various variables of record (such as grade on a status or prerequisite examination, average in mathematics courses, or overall scholastic average in all courses) which are significantly correlated with final average grade in the course in which the particular instructional procedure is being tried. Such variables of record can be considered as indicators of learning potential.

Using this type of statistical control, one can legitimately compare the average adjusted final average grades of the two groups of students and, if the difference between them is significant at a low level of probability, attribute the difference to the effect of the tested instructional procedure. It is, of course, essential that all other instructional procedures besides the one being tested are as nearly identical as possible as they are employed with the two groups of students. This requirement makes it desirable that the two groups of students be instructed during the same academic term, but could undoubtedly be met if the two groups are instructed in two consecutive academic terms.

Mastery Learning in Animal Anatomy and Physiology

Ronald W. Hilwig
Associate Professor of Veterinary Science,
College of Agriculture, University of Arizona

Abstract: Lower division students' attitudes and performance were compared using traditional and learning for mastery methodologies in an instructional program in animal anatomy and physiology. Course and Instructor Evaluation Questionnaire (CIEQ) ratings were lower in the major categories for the mastery metholodogy than when the course was administered in the traditional manner. Use of autotutorial learning aids and models outside the classroom was minimal and students spent the major portion of study time reviewing old examination files to receive passing grades. Given an indefinite time in which to complete 8 written examinations plus a comprehensive final written examination with the option of being reexamined over the same material, as dictated by the mastery philosophy, only 32 percent of the class completed the course within the semester. The remaining students received an "incomplete", giving them an additional year in which to complete the course, or received a failing grade. Students completing the course under the mastery philosophy had an 18 percent better score on the post test relative to students completing the course in the traditional methodology even though their pretest scores were almost identical.

Introduction

A grant from the National Science Foundation, (NSF), under the Local Course Improvement (LOCI) program, was received by the Department of Veterinary Science at the University of Arizona in September of 1977. The three year grant was awarded to help incorporate a "learning for mastery" instructional philosophy into two courses in animal anatomy and physiology and to initiate a laboratory session for one of the courses. Prior to the award only a single 2-semester course was offered and a mixed population of Animal Health Science (preveterinary) majors and Animal Science majors made up the class of approximately 65 students. The needs of these two groups of students were different so two courses covering the same material at

different levels of difficulty were offered beginning in the spring semester of 1978. Animal Science majors completed a lower-division 4-unit 1-semester lecture/laboratory course during the spring semester. Animal Health Science majors and graduate students completed an upper division 6-unit, 2-semester lecture/demonstration course during fall and spring semesters. The lecture topics for the lower division course were the same as for the upper division course but were not covered to the same depth as the upper division course.

The educational philosophy underlying the course development and administration was that all students are capable of learning the same material if given sufficient time and supplemental educational aids with which to learn. This philosophy allows students to complete examinations when they feel prepared, take as long as needed to complete the examinations, and be re-examined over similar subject matter in event they do not know the material or want to improve the score they receive. Peer competition for grades is eliminated and students do not have the pressures of learning the material within an allotted time. Lecture periods traditionally used to administer and review examinations are available for additional instructional time. Criterion-referenced testing, as a part of the mastery approach to instruction, was employed to ensure a properly designed and conducted educational program in which each student met established standards in the cognitive domain.

Materials and Methods

Grant funds were used to purchase or produce audio-visual teaching and learning aids and autotutorial instructional units for use in the lecture, demonstration, and laboratory portions of the course or for student enrichment outside the classroom. Commercially produced slide-tape autotutorial programs in acid/base, cardiac, gastrointestinal, immune, muscle, neurological, renal and respiratory physiology were purchased. Slide-tape autotutorial programs were produced in homeostasis; cell physiology; tissue types and functions; central nervous system; peripheral nervous system; special senses; hypothalamic functions; skeletal system; blood production, destruction and functions; body fluids and osmotic equilibrium; the equine foot; the rumen; and reproductive anatomy and physiology.

Anatomical models purchased from various commercial sources included skeletons of the dog, cat, monkey; skulls of the horse, pig and cow; bones of the legs of the horse and cow; models of the brain, ear, heart, kidney; and dissected specimens of the brain, heart, kidney, eye, and various bones of the body. Latex injected models were made of the kidney, lung, coronet, and joints of the horse. Anatomical models were made of the equine foot and normal and/or pathological tissue specimens were collected from various species and placed in formalin for student inspection.

Organ systems, body parts, and whole domestic animals were obtained for laboratory dissection and study. Motion Picture films and TV tapes were rented or purchased for viewing in laboratory periods.

A slide projector and audioviewer were purchased for classroom/laboratory use and for the production and playback of slide-tape autotutorial units.

The lecture/demonstration portion of the course was conducted in the traditional manner with an increased emphasis on the use of audiovisual materials, anatomical models, and handouts for student use. Course objectives and expected learning outcomes were provided to each student on the first day of class. A glossary of terms for each system or topic to be discussed was given to students at the beginning of study of that subject, and additional handouts were given at appropriate times during the semester. Students were encouraged to complete the reading assignments prior to class and participate in discussions during classtime.

The laboratory portion of the course provided reinforcement of the lecture/demonstration by use of motion picture films, TV tapes, organ system dissections, use of microscopes for tissue studies, and experiments designed to demonstrate physiologic principles. Students worked in small groups in most dissection or experimental procedures and singly in microscopic studies and examinations of anatomical models.

All other aspects of the educational program to this point were essentially in the traditional manner. The evaluation procedures constituted a departure from the traditional method of administering several mid-term examinations and a comprehensive final examination. It was decided to evaluate the "new" with the traditional methods by 1) comparison of student-completed Course and Instructor Evaluation Questionnaire (CIEQ) responses to the lower division course in 1978 when the course was administered in the traditional manner and the same responses in 1980 when the "new" learning methods were fully operational, (1979 was a transitional year in development), and 2) comparison of the 1980 responses in the lower division course with the 1980 responses in the upper division course which covered the same material, in greater depth, but used traditional evaluation procedures for student performance.

The "new" evaluation procedures included 8 written examinations covering specific body systems and associated topics and a comprehensive written final examination. Laboratory reports with experimental conclusions and anatomical identifications were used as evaluative tools for the laboratory portion of the course. The traditional evaluation procedures included 4 written mid-term examinations and a comprehensive written final examination. In each case students were informed that sheer memorization of notes was not sufficient preparation for successful completion of examinations and that any material which was discussed, assigned as reading, given as handouts, or viewed in demonstration or laboratory sessions could and would be used for test material. Further, they were expected to reason, synthesize, and correlate the various segments of the instruction into a composite which would provide them with an understanding of the anatomical and physiological interrelationships which enable the animal to maintain homeostatic equilibrium.

Results and Discussion

The most outstanding result of the "new" evaluation techniques was that only 32 percent of the students completed the course by the end of finals week for the semester in which they registered for the course. Thirteen percent did not complete any of the 8 written examinations or the final examination. Figure 1 indicates the percentage of students completing each examination during the semester but not the order of completion or the date of completion. Approximately 35.5 percent of the students were reexamined at least once although none repeated the eighth or the final examination. The highest number of reexaminations by any student was 4 and none required a third examination over the same subject matter. Seventy percent of the students completing the course required no reexaminations.

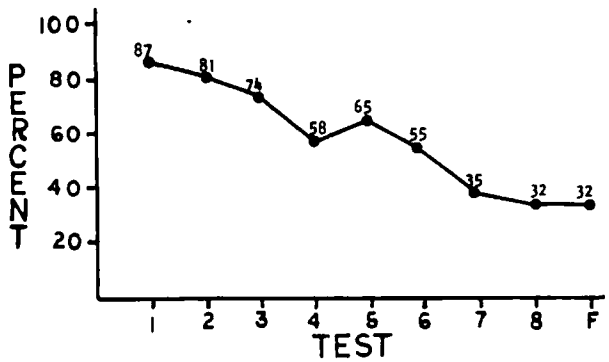

Figure 1: Percent of students completing each numbered examination and the final examination (F).

Student responses by subscales of the CIEQ evaluation are shown in Figure 2. Subscales included General Course Attitude, Method of Instruction, Course Content, Interest and Attention, Instructor and Total. Although decile determinations for each subscale were calculated for the rank of the instructor, the level of the course, the university data base, the College of Agriculture data base, the Department of Veterinary Science data base and an overall data base which includes information gathered on 19,563 classes from several sources, only the overall deciles are presented for simplicity. No significant differences were found among the subscales using different data bases (rank, level, etc.). A difference of 3 or more deciles in any subscale was significant. Decile differences between the 1978 and 1980 lower division course ratings ranged from 1 to 4 and ratings were without exception lower in 1980 than in 1978. Individual items comprising a subscale had decile differences between 1978 and 1980 ranging from 1 to 6 and ratings were generally lower in 1980. Three exceptions to this were 1) "the course material seemed worthwhile" and 2) "the instructor demonstrated a thorough knowledge of the subject matter", which were rated equally and 3) "some things were not explained very well", which received an insignificant 1 decile better rating in 1980.

Decile differences between the 1980 upper division course and the 1980 lower division course ratings ranged from 2 to 5 and ratings were without exception lower in the lower division course. Individual items comprising a subscale had decile differences ranging from 1 to 6 and ratings were without exception lower in the lower division course.

The realiability (consistency of response) for the instructor subscale (.54) in the 1980 and the content and interest subscales (.33 and .62) in the 1978 lower division course was less than the minimum acceptable value (.65) which indicates a questionable decile rating for those subscales.

Scores received on individual tests did not appear to be a deterrence to completion of the lower division course since the average of test scores for students completing the course and those not completing the course were not significantly different. Students completing the lower division course in 1980 had an 18 percent better performance in the post-test than their 1978 counterparts even though the pretests for both groups were almost identical. This figure may be misleading and need recalculation when all students complete the course. Additional data is being collected on students to see if their entering skills and performance in subsequent coursework were improved. These data will take at least 2 years to compile and correlate as students advance towards graduation.

Relatively small use was made of the autotutorial units during the semester. Good use was made of the teaching models and dissecting specimens during laboratory sessions, but they received no student use otherwise. Students employed those techniques that worked best for them in the past, namely studying old exam files and graded exams returned during the semester. This required that extraordinary time be spent in writing 3 or 4 examinations over the same material to overcome the memorization tendency.

Conclusions and Implications

Students, when introduced to the theory of learning for mastery, were enthusiastic but in practice procrastinated to the point that less than 1/3 of the class finished the course within the semester. Use of additional learning aids by students outside the classroom was almost nonexistent. CIEQ evaluations were consistently lower in the semester in which the mastery philosophy was employed relative to the same course taught in the

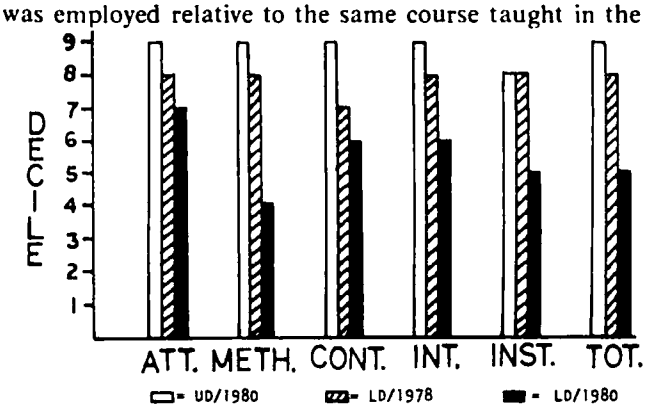

Figure 2: CIEQ subscale ratings for the upper division course in 1980, the lower division course in 1978 and the lower division course in 1980.

traditional manner two year previously. The two subscales receiving the lowest ratings were the methodology and the instructor. The reliability for methodology was a significant .92 and for instructor an unreliable .54. The individual items receiving the lowest decile ratings were 1) "the course material was too difficult" (decile 0), 2) "I would have preferred another method of teaching this course" (decile 2) and 3) "the instructor did not encourage development of new viewpoints and appreciations" (decile 1). The course material in 1980 had the same degree of difficulty as in 1978, but the "new" evaluation procedures appeared to be the most difficult and distasteful for students and were reflected in their CIEQ responses.

Excessive faculty and staff time was required for exam writing, typing, and administration. Students spent most of their study time reviewing old exams in order to get passing grades rather than trying to learn the material. As long as grades continue to be the acceptable measure of performance and advancement the mastery concept will be embraced by few students. Because of other duties and the large commitment of time needed for the mastery concept it is unlikely that many teachers will employ the philosophy in their undergraduate courses.

Improving the Teaching of Agriculture in Nigerian Schools and Colleges

by Ekpo M. Ossom
Agronomy Department,
Purdue University

This paper takes a critical look at, and makes proposals for the improvement of, teaching agriculture in Nigerian Schools and Colleges. The observations are based on the author's personal experiences as a student and as a teacher of agriculture in the British-oriented and American systems of education. While pointing out the strengths and inadequacies of the British-oriented methods used in Nigeria, it suggests that improved education systems which are hybrids between the American system and the British system may be beneficial. These methods include the improvement of student-teacher relationship, more routine use of visual aids, modification of the examination grading system, declassifying examination grades and transcripts and the use of teacher-course evaluations.

Introduction

The psychology of teaching deals with transferring knowledge and information from the teacher to the student for the purpose of widening and deepening the students' knowledge; it also deals with those aspects of the personality and behavior of teachers which influence the students' learning process. Learning agriculture in some Nigerian schools and colleges has not been the best of experiences, and there is room for improvement. While many decisions, such as setting and grading examinations, must remain in the hands of the teachers, the students should have input in certain other aspects such as evaluating the relevance of the course in relation to the goals and expectations of students and evaluating the teacher's performance in teaching the course.

Student-Teacher Relationship

Many Nigerian teachers undoubtedly believe in the hierarchy of status and prestige in the school or college and in the necessity for strict behavioral discipline. Often, however, such teachers easily lose their student following because in the eyes of the students, the teachers have transformed themselves into semi-gods handing down rewards and punishments with iron hands. There should be no gaping gulf between the student and his teacher; rather, the teacher should take a personal interest in the students, treat them with respect, and allow them time for discussion outside the classroom if the student so desires. Students are more apt to learn better under these conditions. An unhealthy negative atmosphere often results when the teacher projects feelings of superiority and creates the feeling that students are a nuisance he must tolerate.

Demonstrations and Visual Aids

Agriculture is a practical science. In Nigeria the common practice is to lecture about the topic, with little opportunity for supervised practical tutoring. Teaching methods should involve demonstration techniques tailored to meet the needs of both the rapidly changing society and the student. If demonstration facilities are lacking, administrative support to obtain or make the proper instructional material, such as colored slides or movies, should be made available. In the tropical rain forest of southern Nigeria, forages are abundant all the year around. Terms such as hay and silage therefore mean little to a student from such a geographic zone whereas to the student from the Savannah zones of the Middle Belt or Northern Nigeria, those same terms are more useful. To make lessons on hay or silage-making (or any agricultural practice) more meaningful to students, practical demonstrations are necessary and must be tailored to the needs of the student. In addition, laboratory exercises which permit student participation must be included if the student is to learn specific crop production practices such as budding, grafting, transplanting, or pest control. Where possible, live specimens should be used in demonstrations. It is not uncommon for a teacher to assume, for example, that a disease symptom is familiar to every student because the disease is common. It is unfair to expect students correctly to identify preserved disease specimens in an examination situation when neither live nor preserved specimens were shown in class. In agricultural engineering, simple practices such as welding and soldering may prove formidable obstacles to students if they have not practiced using the equipment before. Practical demonstrations and supervised training are mandatory not only to provide proper training, but also to teach proper safety techniques. Students have been known to do arc welding in an examination situation without the use of safety glasses even though these were provided (5). Unfortunately, the use of safety glasses was not demonstrated, and the seriousness of not using them was not adequately explained.

Delivering the Lesson

In too many classes in Nigerian Universities, most lesson preparations are rush jobs — especially when final examinations are near. Too often, this leads to disorganized presentation of inappropriate or irrelevant material. Many teachers are more interested in completing the syllabus than in making sure the students understand what is taught. The objectivs of many courses need to be changed from making sure the syllabus is completed to assuring that relevant material is taught at a pace that can be absorbed and understood by the class. Students should be encouraged to ask questions and interact with the lecturer in the course of the lesson. If the lecturer fails to allow questioning, he will likely fail to explain many points which the students most need to understand.

Grading of Examinations

Grades are powerful rewards which a teacher can flexibly use to increase student behavior leading to better class performance. They can also be terrible punishments which completely squelch the motivation of a capable but frustrated student. The system of awarding grades must be fair and open, so that the student can see the grade received is truly the grade earned. The student will then feel he has been treated justly, and the teacher will be held in higher esteem by all students.

In a typical Nigerian university, 70 percent and above is required for an "A" grade (8). In contrast, in the American system, a normal distribution curve is frequently used to award grades, and it is not unusual for an "A" to be limited to 90 percent performance level and above. It is tempting to conclude that an "A" in the Nigerian system indicates less superior performance than an "A" in the American system. This is however, not the case. An "A" in the Nigerian system indicates a performance level that is similar to an "A" in the American system. This has been demonstrated by the performance of several students whose education involved both systems. Such students have been known to earn similar grades in the two systems, and sometimes have performed at higher levels in the American system.

The low grade distribution in classes in many Nigerian institutions leads some students to suspect that some teachers predetermine the grade distribution in a course even before the papers are graded and intentionally restrict the number of students who receive an "A". This colonial philosophy of some Nigerian teachers that awarding an "A" in a course signifies that the student knows as much as the teacher needs to be changed. A better philosophy would be to reward those students who perform in a superior manner with an "A", and the teacher should feel proud that he was able to teach these students enough about the subject to justify awarding this high grade.

Types of Examinations

Multiple choice examinations which are machine-scored were first introduced into Nigerian Secondary Schools in 1966 by the West African Examination Council, an international body responsible for setting, conducting, and grading several examinations in West Africa. However, in the agricultural schools and colleges, most examinations consist of written, essay-type questions. Multiple-choice questions are almost non-existent. Using multiple choice questions should be discouraged as the strongest advantage of the Nigerian educational system.

Multiple-choice questions, despite their ease of machine grading, have the serious draw-back of suppressing students' expression of ideas in their own words. Consequently, it is not uncommon for students whose mother-tongue is English to write poor English (5). On the other hand, essay-type questions have the disadvantage of tempting the student to wander off the main points. Perhaps the best type of examination for Nigerian schools would be to use a minimum of multiple-choice questions and a larger portion of questions which require short, fill-in type answers. Of course the examination should cover all topics taught within a specified time.

Oral examinations are usually conducted in courses which require practical demonstration of ability to manipulate agricultural equipment, identify animal or plant parts and associated diseases, or make recommendations as to utility of given soil types. In large classes of 50 or more students in which each student is examined orally, the need to avoid answers leaking out prevents the teacher from correcting mistakes immediately. This practice should be changed so that incorrect responses are corrected when they are made, thus providing immediate positive reinforcement. In order to provide the needed security, perhaps several versions of an oral examination could be devised. This would provide a fair and objective method of examination, as well as allow the student immediately to learn correct responses to questions that were missed. For graduating or final year students, there may be no other chance to learn the correct answer.

Frequency of Examinations

The present Nigerian system in which there is only one major comprehensive examination at the end of the school year is highly unsatisfactory and should be discarded. One major examination is not adequate to determine the average ability of any student. The constant reinforcement of receiving grades from periodical examinations or quizzes can be very beneficial in motivating students to work harder. Examinations should be done at least once a month in any lecture-type course. Examination dates should be announced at least two weeks in advance and the topics to be covered in the examination should be briefly mentioned to enable students to know whether or not to expect a comprehensive examination. Impromtu examinations should never have any place in any Nigerian school; constant evaluation is a necessity.

Transcripts

It is one of the greatest injustices of the Nigerian educational system that in most universities, schools, and colleges of agriculture, students have no access to final examination grades or transcripts. Since student grades and transcripts are classified as confidential information and students have no access to them, an unhealthy situation arises in which the students suspect that teachers have something to hide regarding the manner in which their examination papers are graded. To remedy this situation, every student should have complete and free access to his own transcripts and grades, but this in-

formation should not be made available to anyone else except at the students' expressed permission.

In Nigerian schools, all science courses are done concurrently with laboratory or practical classes. Unfortunately, this is not so stated on the transcripts. This leads to the unfortunate situation in which transcripts from Nigerian institutions are not correctly evaluated abroad. The wrong assumption is often made that since the transcripts do not indicate laboratory work completed, the students have no laboratory experience. This has caused many Nigerian students in American institutions to repeat courses which they had studied earlier in greater depth and more extensively in Nigeria before they went abroad to study (5).

Course-Instructor Evaluation

Students should complete a course-teacher evaluation at the end of each course. This evaluation becomes a feed-back mechanism enabling the teacher to know his weak points and good points as viewed by his students. He therefore knows if his performance was excellent or poor in the classroom. He thus has an opportunity to make adjustments and improve his methodology, eliminate annoying mannerisms, and become a better teacher.

These evaluations should cover such points as preparedness for class, knowledge of subject matter, organization, ability to interact with the students, and ability to explain difficult material. Previous experience (5) indicates that a teacher's performance from the point of view of his students may be at variance with what the teacher thinks. There is evidence (6, 7) to indicate that while evaluating teachers and courses, students make a distinctive separation between a bad teacher, a badly taught course, and an uninteresting or difficult course. The teacher needs to know this information if instruction in Nigeria is to improve.

Conclusion

It should be the ambition of every teacher to produce students who perform even better than the teacher himself, given the same circumstances. It is a credit to the teacher to be able to train someone superior to himself. Surely, a teacher would feel proud and have inner satisfaction if his former student won a Nobel prize! If these proposals are put into effect, one day, a new Nigerian educational system will emerge, having with it desirable aspects of both the European and American educational systems suitably modified and adapted to the Nigerian situation.

References

1. American Society of Agronomy. 1968. *Current concepts of agronomic education-emphasis on undergraduate teaching.* ASA Special Publication No. 12, pp. 160.
2. Drawbaugh, C.C. and W. L. Hull. 1971. *Agricultural education: approaches to learning and teaching.* Merill. pp. 324.
3. Holland, M. K. 1974. *Psychology - an introduction to human behavior.* D. C. Heath and Co. Lexington, Massachusetts, Toronto and London. pp. 546.
4. McCormick, R. W. and R. J. Woodin. 1959. *Better communication in agricultural education.* Workshop in Communication in Agricultural Education. Ohio State University. pp. 103.
5. Ossom, E. M. Personal observation.
6. Postlethwait, S.N. Personal communication.
7. Purdue Research Foundation. 1975. Teaching-Assistant/Course Evaluation.
8. University of Ife, Ile-Ife, Nigeria. B.Sc. and M. Phil. Transcripts.

Practical Aspects of the Wilmington College General Agricultural Program

Alfred R. Conklin, Jr.
Agriculture Department
Wilmington College

The aim of the Wilmington College general agriculture program is integration without duplication. Students take a series of courses and practicums which are oriented toward the practical aspects of agriculture. Topics within a course or practicum are tied together, courses and practicums are dovetailed, and all work integrated so that a student's program forms a whole by the time he or she graduates. This is done with a minimum of duplication of topics within or between courses or practicums.

Wilmington College defines itself as a career oriented liberal arts college. The career portion of this definition comes largely from the fact that students can take courses leading to a degree in general agriculture or in industrial supervision. These of course are only examples since there are practical aspects to every area of study. The liberal arts portion of this definition comes from the fact that the college has a strong liberal arts program.

The general agricultural program at Wilmington College centers around 4 farms which total 900 acres. These farms are run on a profit making basis. Of the 900 acres 870 are devoted to crops, which consist of corn and soybeans with small acreages devoted to hay and winter wheat. A portion of one farm is devoted to a 100 sow swine production facility while another carries a herd of 60 beef cattle. The crops operations are run by a farm manager and the swine operation is run by a swine herdsman. The beef cattle are handled by students.

The agriculture program can be divided into two parts, the practical and the academic. The practical side comes from a series of practicums which are available each quarter in animal science, agronomy, and farm equipment maintenance and progress from the freshman level to the senior level. The academic side of the general agriculture program consist of course work in agronomy, animal science, agricultural economics, and soil science. In addition students must take a broad selection of courses in the traditional liberal arts.

Practicums represent a chance for students without farm experience to get out on the farm and learn to work. Students spend, on the average, one hour in discussion for each two hours out on the farm working. For example, students might spend one hour discussing seed bed preparation and two hours out in the field preparing a seed bed with a harrow. Or they might spend some time discussing the swine nursery. The tractor maintenance practicum operates in the same manner. Students might discuss checking fluid levels and changing filters and spend two hours carrying out these operations on one of the school tractors.

In the academic course work the practical difference is in the laboratories. This difference lies in two aspects: first, the laboratories usually involve some aspect of the

Wilmington College farming operation, and secondly, the results of one laboratory are important in subsequent laboratories. Or the laboratories are used to complete an analysis or prepare a report.

The following are a series of examples from various fields which illustrate the use of practical laboratory exercises in typically academic courses. In the forages class students establish forage plots and later evaluate the vigor of the grasses and legumes in these plots. In addition students collect forage samples and are quizzed on the basis of these collections. The forages class is dovetailed with the crops course in that students spend a laboratory taking care of the forage plots.

Students spend a large amount of time in the animal nutrition laboratory working out rations. Along with this they carry out the chemical analysis of a feed sample. This sample is obtained from their home farm, the College farms, or from the farm they are working on. The analysis is for protein, lipids, fiber, and ash. In addition, they carry out a feed efficiency trial. In this case interest is gained because the student is working with a sample he or she obtained from a familiar source.

In the soils laboratories students sample farm fields. These fields can either be their own farm, one of the College farms, or a field chosen by the instructor. They take samples which are analyzed by a commercial firm and bulk samples which are used in the remaining laboratories. The results of both the commercial analysis and the student's analysis are used by the student to prepare a report for the "farmer." This takes the form of a fine crop rotation which includes fertility recommendations. Here the idea is for the students to learn how to take data from several sources and synthesize a program.

In the farm management course students bring all their college work together. In this course students carry out an inventory of the college farms or their home farm. The students use this information and information gained from their agronomy, animal science, and soils courses to prepare farm plans. Any one farm may be operated under several different plans thus students in this course are required to evaluate three such plans.

In all course work students use samples and sources of information with which they are familiar and have some interest. They can see the importance of the laboratory work and put the results to immediate use on their home farm or the college farms. And, this also constitutes a thread of continuity running through the courses and laboratories. On a larger scale students find the program becoming a whole. The soil analyses are used to develop soil fertility programs in that course. Results of feed analysis can be used to develop cropping plans, and all of the results can be used to develop a comprehensive farm plan. In this way the samples the students use have meaning, the results of analyzing or handling those samples have meaning and the results of the application of this data can be seen. This allows the student to see the practical application of all the course work he or she has taken.

The conclusion is that the more one laboratory or one course relates to real experiences of the student and depends upon or follows from another laboratory or course, the more interesting it is for the student and more learning results.

Animal Science Without Animals

Robert C. Kirst,
Associate Professor of Agriculture
University of Arkansas At Monticello

In an age of cost containment and stringent accountability can we do without herds to teach Animal Science? We think so at U.A.M., a branch campus located at the opposite end of the state from the main campus system. Although the program is not without problems, it does open some options to small departments, allowing them to maintain their Animal Science program while containing large costs for the university.

In 1978, the decision was made to sell the university-owned teaching dairy, beef, and swine herds. This decision was based on financial considerations. A reduction for higher education in the state coupled with increased costs of maintaining the teaching herds which were not self-supporting were the underlying factors.

With the abolition of the departments teaching herds, the need for securing animals for instructional use was created. To meet this need, three approaches were tried:

1. Animals secured from the experiment station.
2. Animals secured from private producers.
3. Students transported to on site location.

The first year, an agreement was reached with the Agricultural Experiment Station to supply from their surplus animals the needs of our new program. A list of the teaching needs was given to the appropriate unit directors about four months ahead of the beginning of the semester in which the animals were to be used. As the animals became available they were picked up and brought to the campus. After the animals were used in teaching, they were sold and the money sent to the experiment station. This approach worked well the first year with all of our needs being met; however, only part of our needs have been realized in subsequent years.

The breakdown of the experiment station agreement has necessitated securing teaching animals from area producers. In some instances, the animals are brought to campus but more frequently students are transported to the livestock. While securing animals from the experiment station may appear to be the easiest method, the latter two methods have had some definite advantages. Among these advantages are the following:

1. A greater variety of animals is available. A greater variety of breeds within a given class of animals as well as a greater variety in quality is usually available.
2. Specific animal needs are being met more easily. If ten bull calves are needed in a lab one semester, we need not hope that ten will be born.

3. The quality of animals reviewed is more realistic. Students are exposed to animals of every degree of quality and not just the top animals within a breed or class. Thus expectations as to what animals should look like are more in line with what the average producer has.
4. Students are exposed to a greater variety of management practices. When students are taken to farms and ranches, they benefit from exposure to actual management practices, good and bad. This helps broaden their perception of how and why livestock can and should be managed. Students also gain from the experience of the various producers to whom they are exposed.
5. Less expense is incurred. Even with the increasing cost of transporting either students and/or animals, the cost of the transportation program is less than the cost of maintaining teaching herds.
6. Faculty are exposed to area producers. All too often faculty members become isolated from area producers and the problems they encounter. This system forces the faculty to deal directly with producers and provides the faculty with a broader perspective and more realistic concept of production at the local level.
7. This method gains support of area producers for the program. Producers begin to feel as if they are making a definite contribution to the institution. This makes it easier to gain their political and financial support in addition to their supplying animals.

No method of obtaining teaching animals, whether it be maintaining teaching herds, securing stock from experiment stations, or private producers, is without problems. Among the problems encountered are the following:

1. Additional responsibility for the faculty. This includes (a) responsibility for acquiring animals from any of the mentioned sources, (b) responsibility for scheduling classes to coincide with availability of stock and the producers' schedules. This often involves making changes in planned laboratory exercises at the last minute.
2. Not as handy as with a resident herd. Getting livestock from producers requires more long and short term planning. Animals are not as accessible for use as they might otherwise be for demonstrating procedures.
3. Animals usually are not halter broken. This prohibits teaching judging in the traditional sense where animals are tied and students are able to handle them. Appraisal must be almost exclusively visual as animals cannot be handled. This, however, is close to what students will more realistically experience after graduation.

Despite obvious disadvantages, most of which are never known by the student, not having resident teaching herds has not been ineffective.

Since this is an evolving program, the future is yet unclear. Several measures are being considered to support or replace current methods of obtaining animals. One such alternative would be to contract with the local sale barn to purchase for the department needed livestock. The animals would be sold when they were no longer needed, with the university absorbing any loss. It is generally felt that unless there was turn down in the market, little or no loss would be incurred.

Overall, Animal Science without animals seems to be working quite well. The students, faculty, and the department are benefiting from the program.

There are problems that will have to be worked out in the future if this approach is to be continued. However, none of these problems seems to be insurmountable. This approach may be the answer for small colleges offering Animal Science with limited funds.

Experiences with Detailed Course Objectives in Introductory Soil Science

K. A. Barbarick
Assistant Professor of Agronomy
Department of Agronomy,
Colorado State University

Usually the objectives of courses are implied by the instructor rather than explicitly stated and distributed to the students. This often leaves a student with a sense of frustration when organizing his study of a particular course. Students attempt to "psyche out" what the instructor feels are the important aspects of a course.

As a student and a teacher, I have found that objectives are a very useful tool for every type of course. However, in fewer than 10 percent of the courses that I took did instructors communicate their objectives to the students. When I started teaching Introductory Soil Science, I decided to pass out course objectives to the students. Some interesting aspects about the use of explicitly communicated course objectives have been expressed by students and other instructors. The objectives of this paper are 1) to express my opinions and those of students and other instructors on the use of objectives in Introductory Soil Science or other courses and 2) to generate discussion of the use of course objectives. Advantages and disadvantages of using objectives will be presented and discussed. This list makes no attempt to cover all the advantages and disadvantages of this learning tool.

Advantages

1. Objectives give students an indication of what material or skills they should learn. This generally improves students' attitudes since students feel the instructor is not "hiding" the important aspects of the course.

2. Objectives help organize the course. They provide for the instructor a guide for his presentations and

emphases in the course. They also help organize students' study. Communication of the objectives allows students and instructors to focus on the relevant material in the same manner.

3. Course objectives improve exam preparation. Exam questions should be taken from the objectives even though the wording may not be exactly the same as the objectives. Properly worded objectives provide criteria for evaluating student learning. I believe the use of objectives allows a teacher to evaluate students more effectively than if objectives were not communicated to the students. Students also have indicated that objectives help make exams fairer and a good representation of what they have learned.

4. Objectives demonstrate that learning has occurred. If the proper behavioral terms are used to construct objectives, then the response of the students can be measured (Mager, 1975; Alexander and Abedor, 1971). This is especially important in introductory courses since they provide the framework of basic information that students need in more advanced courses. This is also true for a course such as Introductory Soil Science because it is often the only course in Soil Science that most students take.

5. I believe this tool increases student learning and participation and improves student attitudes. Students have related that they study more in courses where objectives are used and that their goals (eg. a particular grade) are attainable. Students also become more involved in the course. Often students are so confused by a course they don't even know what questions to ask. Objectives help students formulate their questions. I have also observed that students tend to be more at ease asking questions in the context of the objectives. Course objectives also cause students to study the textbook more.

6. I also think that objectives encourage students to learn at the higher levels of Bloom's taxonomy of educational objectives (1956). Objectives do help students 1) learn some knowledge, 2) interpret the knowledge, and 3) apply the knowledge to concrete situations. If properly designed, the objectives will also cause the students 4) to analyze knowledge, 5) to synthesize the information from a number of courses, and 6) to evaluate experiences in relationship to the new found knowledge. Objectives should encourage students to reach all levels of this hierarchy before examinations or the end of the course.

7. Finally, students have told me that objectives help them use their study time more efficiently. By keeping up with the course objectives, students can more easily master materials presented in lecture and textbooks. Objectives also provide an excellent review for exams.

Disadvantages

1. Some students do not like their thoughts controlled. A small minority of students don't like the fact that objectives dictate what they should learn.

2. The preparation of good objectives requires a great deal of time and effort. The activity, degree of proficiency, and conditions required for a student to achieve a specific objective must be explicitly stated. Since the student must know exactly what is expected, writing properly designed objectives requires an intense and continuous process. It can be argued that more time is spent in the preparation of objectives; however, the effort is worthwhile if it improves the learning of students.

3. In Introductory Soil Science, I found that I had to use 200 to 250 objectives to cover thoroughly the material. These objectives came directly from lecture, labs, or the textbook, or they required synthesis and evaluation of various aspects of the course. This leaves students with a sense of frustration since they sometimes have difficulty finding the answers to some objectives. Students have stated that the objectives involving the higher orders of Bloom's taxonomy (1956) are too broad, vague, or the wording is ambiguous. These thoughts may result since objectives that require analysis, synthesis, or evaluation are more challenging than objectives that require knowledge, interpretation, or application.

4. Some instructors have told me that they don't use objectives because they think using them gives the answers away. The idea that students know the questions before an exam is appalling to some teachers. Apparently, these instructors feel that they lose a certain amount of control in their classes by the use of objectives.

5. One disadvantage I have found with objectives involves exam questions. Occasionally, class discussion will generate information for an inspirational exam question that is not covered by the objectives. Those questions cannot be used during that term; however, proper objectives could cover the information for future classes. According to Milton and Edgerly (1977), exam questions should match the stated objectives of a course.

Conclusions

If objectives improve the learning of students, I feel that they can and should be used in every college course. My experiences and the response of students in Introductory Soil Science to course objectives are generally positive. Knowing that objectives require a great deal of effort but are generally appreciated by students, I will continue to use course objectives in courses that I teach.

References

1. Alexander, L. T. and A. J. Abedor. 1971. Are our instructional objectives stated clearly? *Educational Development Program Comment*. Number 8. Michigan State University.

2. Bloom, B.S. (Ed.). 1956. Taxonomy of Educational Objectives. *Handbook I: Cognitive Domain*. McKay, New York.

3. Mager, R. F. 1975. *Preparing Instructional Objectives* (2nd ed.). Fearon Publishers, Belmont, California.

4. Milton, O. and J. W. Edgerly. 1977. The Testing and Grading of Students. *Change Publications*. New Rochelle, New York.

Up-Date of Jonathan Baldwin Turner Agricultural Scholarship Program

R. D. Seif
Professor of Agronomy
University of Illinois

Because of the interest shown in the University of Illinois Jonathan Baldwin Turner Agricultural Scholarship Program at NACTA Conference last year this update will let you know about the program after approximately 1 and 1/2 years of operation. The JBT Program

has been established on a no need financial basis and consists of a $1,000 scholarship to be paid as follows, $500 the freshman year and $500 the sophomore year, given the attainment of high scholarship as a freshman. The scholarship monies are from private contributions. Applicants must be in the upper 10 percent of their class or have an ACT score of 26 or greater and have a sincere interest in academic programs in agriculture.

Results

Fifty prospective freshmen applied and were interviewed in the spring of 1979, and 25 JBT Scholarships were awarded. These 25 scholars have just completed two semesters work, with 6 achieving a straight A average for both semesters and 4 others obtaining one semester of straight A's. The JBT's had a fall semester grade-point average of 4.6 (based on 5 point scale). Twenty of the 25 JBT's ranked in the 99th percentile of their high school class and the 25 had an average ACT score of 29.5. Two of the 25 scholars have transferred to other colleges and forfeited their scholarship.

During the 1979 fall semester a banquet was held to honor the JBT students and to encourage scholarship donations. The JBTs, their parents, and their favorite teacher were guests, along with current and perspective scholarship donors, faculty, and others intimately involved with the JBT Program. This banquet met with extreme success as has the whole JBT Program.

During the spring and summer of 1979 approximately 200 high school juniors applied for JBT Scholarships and approximately 200 interviews were conducted in August of 1979. From this group of high school seniors, 50 recipients have been selected who will enter the College this fall as 1980 JBT freshmen. These fifty perspective 1980 JBT freshmen had an average ACT Score of 29.2 and 36 ranked in the 99th percentile of their high school class.

From the 75 JBTs (1979 and 1980 freshmen) at least one JBT Scholar has been selected from each of the 10 geographic regions of the state, with a large number (32 percent) coming from the Chicago Area. A high percentage of the scholars (30 percent) are also interested in Animal Science and/or preveterinary with the next greatest interest shown in Agricultural Engineering, followed by Agricultural Economics and Home Economics.

Everyone feels that this Program has been good for all concerned — the JBT Scholars, the College, University, high schools and agriculture in general. The Program has a great public relations affect and helps to show that a big University can be personal and that it cares about scholarship and that scholarship will be rewarded. Already we have had requests for 530 JBT applications from 1980-81 high school seniors. Interviews for these applicants will be held late this summer and another 50 JBT Scholarship recipients designated.

For more specific details about the JBT Program see the article **Jonathan Baldwin Turner Agricultural Scholarship Program.** 1979. **NACTA Journal.** XXIII No. 3, September, p. 20-21, or contact the author.

MINUTES OF THE FIRST NACTA EXECUTIVE COMMITTEE MEETING

26th Annual Conference, Las Cruces, New Mexico
June 15, 1980

The meeting was called to order at 5:45 p.m. by President Shrode in the Corbett Student Center of the New Mexico State University. An agenda prepared by the President was adopted by the committee.

Executive committee members present were Shrode, Stufflebeam, Brown, Everly, Blackmon, Miller, Stelmaschuk, and Irwin. Chairmen of NACTA committees present were Seif, Vorst, Craig, and A.W. Burger.

The Secretary-Treasurer presented his reports on NACTA Membership and NACTA Finances. Membership increased from 768 in 1979 to 891 current members. Total assets of the organization increased $1,985.68 during the past fiscal year. Copies of the reports, as accepted by the Executive committee, are attached.

The report from the Vice President was deferred to a later Executive committee meeting.

The **NACTA Journal** Editor reported that mailing costs for distributing the **Journal** have increased considerably in the past year. Both the size of the **Journal** and the numbers of copies mailed out were the highest ever during the year. Work of the Book Review board during the past year was reviewed by Chairman A.W. Burger. Chairman Vorst of the Media Review board reported on the work of that board. Copies of these reports, as accepted by the Executive committee, are attached.

The Program chairman, Lewis Holland, reported that the hosts were ready for the conference. He reviewed the conference schedule with the Executive committee.

The President then appointed Auditing and Resolutions committee members as follows: Auditing committee — William Treese (Chairman), Frank Carpenter, and Edward Frederick. Resolutions committee — Robert McGuire (Chairman), Lee Doyen, and Peter Fogg.

The Regional Directors presented brief reports of their activities during the past year. Their reports were accepted by the Executive committee. Copies of the Eastern, Southern, and Canadian region reports are attached.

The report of the NACTA Teacher Recognition and Evaluation committee was presented by Seif and accepted by the Executive committee. A copy of his report is attached.

The Chairman of the E.B. Knight **NACTA Journal** award committee, Craig, reported on the work of that committee. A copy of his report, as accepted by the Executive committee, is attached.

The meeting was adjourned at 7:05 p.m.

Respectfully submitted by:

Murray A. Brown
NACTA Secretary-Treasurer

NACTA Annual Meeting
June 17 and 18, 1980

The program committee has scheduled the annual meeting in two sessions. Division of the agenda items between the two sessions is as estimated in advance. The session on June 17 will be presided over by 1979-80 President, Bob Shrode, and the June 18 session will be presided over by 1980-81 President, Chuck Stufflebeam.

Agenda

Convene at 3:30 p.m., June 17, 1980

General comments	Shrode
Announcements	Holland
Reports	
Nominating committee	O. J. Burger
Secretary-Treasurer	Brown
Publication Committee	Everly
Book Review Board	A. W. Burger
Teaching Media Review Board	Vorst
E. B. Knight Journal Award	Craig