(identical to the UFFF output), the weight of the bird to be produced, the amount of feed intake, and the economically efficient protein and energy levels per unit of feed.

Program Descriptions

Both programs use an interactive editor. The student is first presented with a menu that allows reading a stored problem or the creation of a new one. A second menu allows the student to edit ingredient names and limits, nutrient names and limits, the ingredient/nutrient matrix, the ingredient costs, proportions between nutrients, or the quadratic equation (BQP only). Brief instructions and function key definitions are included at the top of each screen throughout the programs. An additional choice from the second menu causes the problem to be solved.

Two input/output (I/O) screens from the program give the ingredient usages (with marginal price changes for use) and nutrient levels (with shadow prices). Ingredient costs and nutrition restrictions are listed on these screens and can be edited from them. The problem can be re-solved immediately by pressing a function key. BQP has an additional I/O screen that contains the feed cost per bird (which may be edited) and resulting weights, feed consumption, and economically efficient energy and protein levels.

On an IBM PC, UFFF can solve a problem with 17 ingredients and 19 nutrients in approximately 25 seconds; but requires only a few seconds on an IBM PC/AT with a math co-processor. BQP takes approximately 108 seconds to solve a problem with 15 ingredients and nine nutrients on a standard IBM PC.

Instructional Use

Our teaching experience with the UFFF program has been that it can be learned by undergraduates with little problem. Graduate students, on the other hand, may be reluctant if they have experience with another feed formulation program. The problem is not with a lack of features. Instead, they appear to have difficulty in learning a second syntax. For instance, they may want to enter an ingredient number to edit an ingredient name (former program syntax) when all they need to do is move the cursor to the appropriate place on the screen and type over the previous name (UFFF syntax).

Program Availability

The UFFF and BQP programs are available from the University of Georgia College of Agriculture Electronic Bulletin Board for use in undergraduate or graduate instruction. Programs may be downloaded to a microcomputer by connecting to (404) 542-0836 at 1200 baud, 08 bits, 01 stop bits and NO parity. Material downloaded will include the program, example problem files, a license agreement and an invoice for $10.00 to cover distribution. Copies of the programs on 5¼" floppy diskette and documentation for the editor (Pesti and Miller, 1987) may be obtained by writing to Agricultural Communications, University of Georgia, College of Agriculture, Athens, Georgia 30602.

References

Dent, J.B. and H. Casey, 1967. *Linear Programming and Animal Nutrition*. J.P. Lippincott Company, Philadelpha, PA.

Lee, T.C., 1975. Unpublished notes, Agricultural Economics Department, University of Georgia, Athens, GA.

Miller, B.R., R.A. Arraes and G.M. Pesti, 1986. "Formulation of Broiler Finishing Rations by Quadratic Programming." *So. J. Agr. Econ.* 18:141-150.

Pesti, G.M., R.A. Arraes and B.R. Miller, 1986. "Use of the Quadratic Growth Response to Dietary Protein and Energy Concentrations in Least-cost Feed Formulation." *Poultry Science* 65:1040-1051.

Pesti, G.M., and B.R. Miller, 1987. *Least-cost Poultry Feed Formulation: Principles, Practices and a New Microcomputer Program*. University of Georgia College of Agriculture Research Bulletin (In Publication) and Software Series No. 2.

Teaching Communication Skills in the Agriculture Classroom

Julia Gamon

The well on my grandparents' farm was shallow and often went dry in a summer drought. Water was, consequently, a precious commodity which my grandmother used very carefully. I remember visiting as a child with my baby brother and watching her get the very last drop of good out of a pail of water. First she gave the baby a bath, then she reused the water to wash her hair, a batch of diapers had the next turn, and finally she poured the water on the rose bushes by the back door.

College classroom time is also a precious commodity; there is so much to teach in so little time. Choosing what will be of most value to students is a constant challenge for agriculture teachers because of a continually changing agricultural knowledge base. It takes skill to choose what is important to teach and to teach it in a manner that will enhance maximum learning.

Communication Skills - A Priority

At a teaching retreat for agriculture professors at Iowa State University in the summer of 1986, one of the main concerns identified was the need to teach communication skills within agriculture courses. This concern is echoed by potential employers of agriculture college graduates. Magill (1982) and Broader and Houston (1986) found that communication skills were at the top of employers' wanted lists. Students won't get a chance to use their agricultural knowledge unless they know how to communicate with potential employers. In a recent *NACTA Journal*, Cobia (1986) stated, "We owe it to our students as well as our profession to enhance student communication skills."

As added incentive for teaching communication skills is that as students communicate to others, they learn more themselves. When students merely listen to

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what the teacher says, as in the lecture method, their retention rate is low. When they present the material themselves, their retention rate is high. A classic model of teaching methods is the Cone of Experience first introduced by Edgar Dale (1969). Dale found that listening to someone talk or lecture was at the very bottom of effective learning experiences; actually doing something was at the top. Learning by doing, then, is one of the best teaching methods.

Practicing Communication Skills

In-class presentations provide students with the much-needed opportunity to practice expressing their ideas in front of a group. In order for these presentations to be effective, some questions need to be answered: (1) How can the instructor find time to cover the material? (2) How can the instructor keep control over what is taught? (3) How can day-after-day of student presentations be kept interesting to the class? (4) How can presentations be graded in an effective manner? (5) How can everyone in a large class give a presentation?

For several years, I have employed a strategy that has answered these questions. I have successfully incorporated student presentations into one of my Agricultural Education classes, "Survey of Educational Programs in Agriculture." The key ingredients are a set of resource material folders, instructor input into presentation plans, and peer evaluations. Students choose their presentation topics from a prepared list. Then they consult the appropriate resource folder and write out a detailed presentation plan. As each ten minute presentation is given in class, it is peer-evaluated. As a result, it is possible to use in-class student presentations and to solve the problems associated with them.

Answering Instructor Concerns

The first impediment to class presentations is lack of time. Because my classes typically have twenty students or less, student presentations take a relatively small proportion of the class time. It is not difficult to find time for student presentations during the last half of the course. However, even with large numbers of students, it is important to take time for practicing communication skills. Often we are so anxious to get through all our material that we forget the important thing: how much is learned, not how much is taught. Providing an opportunity for students to communicate during class increases their rate of learning. We can see this in our own experiences. Most of us look back on our first year of teaching and say, "I learned so much; I learned as much as the students." The reason we learned is that teaching others required us to organize and verbalize what we knew. The same procedure helps students to learn.

I am also able to retain control over what is taught *during* the student presentations for the introductory course, "Survey of Educational Programs in Agriculture," by preparing a list of topics and asking students to choose from the list. I have a list of twelve topics which need to be covered. Example topics are "Adult and Young Farmer Programs," "Laboratory Facilities and Management," and "Community Resources." Sometimes a student will have an idea for a topic not on the list. For example, last semester, a student wanted to do his presentation on "The Use of Computers in Agricultural Education." Since this was a topic of interest and importance, it was added to the list of topics.

Another way in which I retain control over what is taught is by summarizing after each presentation and during periodic reviews. This is an opportunity for me to emphasize important points, correct any mistakes in information and pose problems which will help students apply what they have learned from the presentation.

The resource folders guide the students in their selection of what to teach. A shelf in our resource room has books and periodicals which are useful. I continually add and subtract materials so as to keep the folders as current as possible. I keep a list of names, addresses and telephone numbers of resource people for each presentation topic. People who are busy and important are surprisingly willing to help an interested student. Capable, creative students often bring in names of new resource people and examples of new materials to add to my collection.

If all students were capable and creative there would be no problem with day after day of student presentations. Unfortunately, some students will exert minimal effort. As a result, presentation quality can be greatly improved by requiring more detailed advanced planning. The basic tool for planning is a hand-out sheet with spaces for objectives, an introduction with an interest approach, a conclusion and an outline of what, when, who, and how.

I usually help students decide on the objectives for their presentations. The materials from the folders can get them started with ideas, but many of them still need guidance on choosing two or three main ideas on which to focus. A majority of my students have had extensive public speaking experience in FFA, 4-H and high school speech contests, but they still need help with planning and organizing a presentation.

Students are required to turn in their plans. Occasionally, I ask students to rewrite their plans. A common problem is failing to plan for participation by other class members, whether it be a time for questions or an in-class activity. In a ten minute presentation, interaction time is limited, but the better presentations always involve class members.

Another common problem is neglecting to plan an interesting approach and an interesting conclusion. I suggest linking together the beginning and the ending with a common theme. Presentations which start with an example should end with a related example. Often the introduction is well done, but the student will falter

on the conclusion. It seems to be difficult for students to restate the important points, to "tell'em what you told'em."

Requiring detailed careful plans is an important step in increasing the quality of student presentations. Another technique I use is to ask the students to write down and turn in two or three questions that the rest of the class should be able to answer after hearing their presentation. Thinking of potential questions helps the students identify the objectives for their presentations. They ask themselves, "What is important for us to know about this topic?"

Even with high quality student presentations, the interest and involvement of other class members may be low. The person giving the presentation is learning a lot, but his/her audience is often disinterested. I have dealt with this in two ways. My first strategy is to test over what is presented by the class members. My second strategy is to require that each class member evaluate every presentation on a score sheet which has room for a numerical rating and comments. Part of each student's grade depends on how well he/she has evaluated other students' presentations. My students have taken the evaluation part very seriously and in general do an excellent job of evaluating their peers. It has been gratifying to me to see the congruence between my perception and the student perceptions of each presentation. We almost always agree.

My grading procedure has been to assign a letter grade and to write out comments to be given to the student. In my comments, I use the "sandwich" technique, good-bad-good. I make the first slice of bread very thin, mention one good thing, then all the suggestions for improvement followed by a thick slice of compliments. I give the comments from the students to the secretary to type and I quickly scan the comments before giving a copy to the student presentor with my comments and the grade.

An advantage of the student comments, in addition to keeping the student audience interested in the presentation, is the impact of the comments upon the presentor. The repetition of the comments from the students drives home to the presentor the points that could use improvement. If 20 people tell a student to improve your eye contact, the student begins to believe improvement is needed!

Is it also possible to use student presentations with very large classes? Yes. For example, groups of students interested in the same topic can get together, give presentations to each other and select the best one to be given in class. Teacher time needed to advise students on presentation content can be minimized by providing a folder of resource materials available on a check-out basis. Time spent on comments may be reduced by asking the secretary to type every tenth comment rather than comments from the entire class. Another possibility would be for small buzz groups to write comments as a group rather than individually.

Student Evaluations

What do students think about giving class presentations? I polled two sections last year and got the following results.

Students were relatively unapprehensive about giving presentations (2.65), perhaps because of their extensive background experience (4.40). They were very appreciative (4.65) of the comments from their peers. Their written comments about giving presentations were mainly positive. Some examples follow:

"Presentations are important. As teachers or business people, we'll be presenting ourselves everyday. Besides, practice makes perfect."

"I felt that the presentations added a lot to this class."

"I thought the class presentations went very well. Most people did a real good job on them. I felt that most everyone had researched the topic well."

"Perhaps too much of the grade (25%) was based on the presentation."

"The critiques helped us pay attention to what they were doing good and what they weren't so good at."

"It's good for us to judge because we'll have to judge our students."

"The critiquing was difficult because you don't know how hard to grade them."

"I enjoyed receiving the critiques from other students. I feel that I can learn a lot from my fellow students' anonymous opinions."

"Writing questions helped me review and understand my material."

Another evaluation came when I was visiting a former student who was out doing his student teaching. He was using a similar presentation technique for one of his classes. He had asked his students to present part of their lessons themselves — sharing materials and guiding them as they made their plans. He was excited about the results and I was pleased to see the idea adopted in another situation.

Summary

Educators and employers agree that agricultural students need more help in communication skills. The problem is finding the time and the method to teach such skills within the constraints of existing courses. I have found that student presentations can be an effective method of teaching course content. I have used resource material folders, presentation plans and peer evaluations as effective tools to insure that students presentations effectively cover the content. My responsibility is to emphasize important points, monitor the information presented and enhance application through problem solving. The students are responsible for increasing their knowledge of their topic plus practicing their communication skills. Taking a lesson from my grandmother's use of a pailful of water, I have gotten multiple good out of one activity, student presentations.

References

Broder, J.M., and J.E. Houston. 1986. "Employer Assessments of Graduates," *NACTA Journal* 30:18-22.

Cobia, David W. "Incorporating Writing in Agricultural Courses," *NACTA Journal*, June 1986, pp. 22-25. 3-(2).

Dale, Edgar. *Audio Visual Methods in Teaching*. 3rd Ed. The Ohio State University, 1969.

Magill, Becky. "Communication Skills Top Employers' Wanted Lists." *Spectrum*, North Dakota State University, May 14, 1982, p. 1.

Recruitment Strategy With A Detailed Marketing Plan

Ward E. Nefstead

Abstract

Because of an advisor's role in developing competitive marketing plans as part of the National Agri Marketing for student competition and the need for the same process in the marketing of post-secondary education, the author received a single quarter leave to investigate how a marketing plan could be developed for an individual department or major. The research identified and noted as part of the leave included a product profile, competitive positioning, target market analysis, and promotional alternatives.

Declining enrollment at institutions of higher education has become a well-established trend. This is particularly true with regard to colleges which offer agricultural programs. In an attempt to reverse this trend, many institutions have initiated efforts to incorporate marketing techniques to assist in the area of student recruitment and then student support areas.

Several papers in the *NACTA Journal* have reported progress in incorporating marketing techniques. Schuster and Castantino (9) have conducted market research with regard to the student enrollment decisions at Virginia Tech. Betts and Newcomb (1) report on high ability students' perceptions of agricultural study in Ohio. Mollet and Leslie (6) have established a demographic profile of beginning animal science students at the University of Missouri. Drueckhammer and Key (4) have undertaken product evaluation of educational programs at Oklahoma State University. Each of these papers deals with a marketing concept applied to education.

A single quarter leave taken by the author in the summer of 1984 offered the opportunity to explore how business concepts of marketing could be incorporated in the educational sphere. A small grant through the University of Minnesota offered financial assistance in this effort. The major products of this leave were an industry verification of educational objectives in a sabbatical program, a perceptual analysis of competitive institutions made by employees of students, a survey of target markets for student enrollment, and the development of a marketing plan and several accompanying strategies.

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The marketing plan focused on an existing major at the University of Minnesota Technical College, Waseca, which had recently been part of a curriculum review to add an option area. The marketing plan is based on a strategy of growth in the agribusiness sales and marketing program.

Kotler (5) demonstrates how a marketing plan can be assembled with reference to education. The steps are as follows:

(1) **Situation analysis** (background, normal forecast)
(2) **Opportunities and Threats**
(3) **Objectives and Analysis** (includes selecting a target market)
(4) **Marketing Strategy**
(5) **Action Steps**
(6) **Budgets to Accomplish the Above Steps**
(7) **Evaluation of Marketing Plan**

The paper will follow this outline in reporting the research undertaken in 1984. Kotler (5) suggests that institutions must react to changes in several environments: macroenvironment (including outside forces, such as the economy); a public environment (public image of institution); market environment (such as potential students); and an internal environment (faculty and curriculum). A marketing plan must address all of these environments at the **college level.** At the department or major level, Kotler suggests that large universities which have different locations need to do strategic planning at each branch, since each has different threats and opportunities. This is extended for the purpose of this paper to the individual program, or major. The treatment of the major is similar to that of the management of a product in an industrial setting. It may well be that the program will need to be marketed to new enrollees to insure graduation of these individuals. Schuster and Castantino (9) found that about 29.9% of the group sampled at Virginia Tech made their career choice while in college. The following section addresses the situation facing the college and its environments.

Situation Analysis

Macroenvironment:

The University of Minnesota Technical College at Waseca is a public, two-year postsecondary collegiate institution with a single mission of providing mid-management technical education for rural homes and businesses.

1. UMW is dependent on state funding for a large share of its budget.
2. UMW is in an area of Minnesota with a relatively stable rural population. Most students in the past have come from a radius of 75-100 miles.
3. The rural agricultural economy is in the depths of a severe downturn or recession with many farms currently being threatened.
4. Technology continues to develop in products of agriculture and its service industries.