Summary

In this case these conclusions seem appropriate:

(1) The quality of student leaders is vital to an effective student attempt to evaluate instruction. This can vary over time from aggressive to apathetic, competent to incompetent, etc.

(2) A new idea of this nature has numerous hurdles to overcome before it can succeed, for example, resistance by the status quo, the mere mechanics of handling and processing the data, financial support to pay the bills, and cooperation from students, faculty and administration in the collection and analysis of the data. Securing volunteer cooperation from the faculty on the evaluation of problem courses as well as good courses become difficult.

(3) The financial support an institution can give to innovative projects, whether faculty or student, is limited and comes under close scrutiny with tighter budgets.

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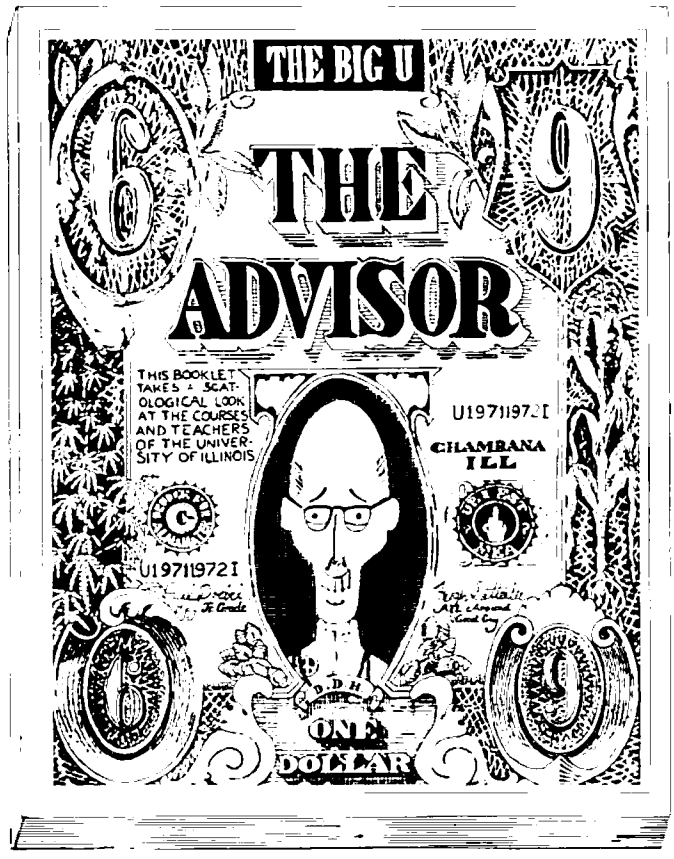

A NEW IDEA IN AGRICULTURAL ENGINEERING ORIENTATION

by W. G. Matlock and M. L. Schield*

The need for orientation in a subject matter area as a means of career motivation and prevention of dropouts has been recognized by many educators. Traditionally, the student takes a course which presents information about his career field. Studying about a field has not always supplied the career motivation desired. A better introductory course would be one in which the student actually does what he will be doing in his chosen career. The departure from traditional methods should challenge and interest the student.

Until the Fall of 1969, a general orientation course was taught for all College of Engineering freshmen, including students majoring in Agricultural Engineering at The University of Arizona. At that time, the general course was dropped in favor of individual departmental orientation courses.

Enrollment in Agricultural Engineering at The University of Arizona has not been large enough to justify a freshmen orientation course. Therefore, the freshmen Agricultural Engineers were combined with non-engineers in a 2 semester-unit course organized to meet the needs of the two diverse groups of students. The defined objectives are:

1. to introduce the students to the engineering profession, its functions and branches; agricultural engineering and its uniqueness; the qualifications, duties and responsibilities of engineers
2. to provide practice in the use of basic engineering tools such as units, unit factors, measurements, significant figures, scientific notation, slide rule, accuracy of computations, and sketching
3. to present the philosophy, techniques, and application of the engineering method of problem solving
4. to permit the student to participate in a supervised creative design project
5. to give experience in engineering report preparation and presentation.

Various teaching methods are used including lectures and discussions. Slides, films, guest speakers, and tape recordings provide information about the engineering profession and particularly agricultural engineering. The course textbook is Careers in Engineering and Technology** by Beakley and Leach. Although not followed rigidly, it is an excellent introductory text, especially in its presentation of the engineering method of problem solving.

Because some students have had previous experience in engineering fundamentals, an opportunity is given for taking a pretest in certain areas. If the student successfully passes the test, he is not required to attend the classes devoted to that subject.

The basic teaching team is composed of one professor and one graduate assistant. Other faculty members serve as guest lecturers on such subjects as research, design, and career opportunities. Early in the semester, the students are divided into groups of four to six for the design project activity. An attempt is made to 'balance' the groups in terms of the student's major subjects and units completed. Originally each group elected a chief engineer, but more successful group operation has been obtained with the chief engineer appointed by the instructors.

To further the development of group spirit, group members are seated together for the balance of the semester. Each group selects their design project from a list of approved projects or may choose a new project with the approval of the instructor. Approximately one-fourth of the class periods are devoted to supervised group activities connected with the design project. Faculty members or engineers and other specialists in industry serve as consultants. Questionnaires sent to potential users of the products have provided useful information in a number of cases. Shop and laboratory facilities are made available to the students at various times outside of class for research, tests, construction of models, and prototypes.

Near the end of the semester, a written project report is submitted. A presentation on each design project is given by the responsible group followed by an open discussion. This occurs in

the classroom or laboratory and may include a demonstration.

The design projects have covered a wide range of ideas. Some were quite successful and others have been recognized by the students themselves as having seriously limited commercial application.

As an example of a successful project, one group designed a universal alarm system which has application to failure of electric power, refrigeration systems, irrigation pumps, etc. During the past year, milk was spoiled at the University of Arizona Dairy Science Center because of a refrigeration system failure. A survey of other dairy plant operators in Arizona indicated that many were interested in the alarm system and would pay $75 or more for such a device.

The alarm system was a relatively simple battery-powered device utilizing a bell, buzzer, flashing light or horn as an indicator of system failure. With a bell as an indicator, total parts cost (retail) was less than $15.00. Following completion of the class project, the group was permitted to design and supervise the installation of an alarm system for the University of Arizona Dairy. This gave them additional practical experience in satisfying a recognized need.

Grades in the course are awarded on both objective and subjective bases. Two one-hour examinations and a two-hour final are given. Results from these tests are then combined with a subjective evaluation of the student's attendance, interest, participation in discussions, cooperation and effort in group activities, and oral and written reports. At least 70% of the final grade is determined by the student's participation on the design project.

Evaluation of the course by the students has been made each year, and the results, to date, have been extremely favorable. Most replied that they would recommend the course to others. Comments made by the students for improving the course have been helpful.

Although the original combination of the students with different class standings and major interests was made for expediency, observations now show the value of the mixed class. Maturity, experience and a greater breadth of understanding of agricultural problems are brought to the class by the non-engineering students, who typically take the course as juniors or seniors.

Much has been learned regarding the type of projects which have the greatest possibility for successful completion. Minor changes are made frequently but several major revisions will be initiated in the Fall of 1972. They are:

1) material on the engineering method of problem solving and engineering design will be presented early in the semester to avoid delay in starting the design project, 2) a series of single page reports will be required on a regular schedule to permit the instructors to more easily evaluate the progress of each group throughout the semester, 3) a critique of each project will be made following the report presentation, 4) a guest lecturer on the use of digital and analog computers will be added.

Stimulation of creative thinking is a difficult task. The authors' approach has been to provide a flexible orientation course with a major requirement being participation in a design project. Hopefully, this encourages the student to continue his education with a better understanding of the utility of many of his courses. He will also have gained confidence in his ability to think and do things on his own, as he will have to do in his chosen profession.

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FOREIGN PROGRAMS: WHO IS WHERE?

Compiled by: Wayne Kroutil, chairman
NACTA Committee on
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Many faculty members in Agriculture continue to express an interest in foreign teaching work to complete another dimension of their professional development.

Many of us have a desire to work overseas. Knowing how to go about obtaining a position may not be so easy. A previous article submitted in this journal in 1970-1971 by the International Programs in Agriculture Committee gave several contact organizations. The committee has chosen other paths to follow in knowing who to contact. A fruitful source of contacts is the foreign programs director of the major universities. These schools may "sponsor" a school in a foreign country or at least sponsor some particular program at a foreign school.

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