Collect Journals

H.W. Student Handbook

November 5

Division/Technology Session

November 7

Topic: Grades and Academic Standards. Use Handbook to explain how to figure GPA Begin Grade Point Assignment, finish for homework

H.W. Chapters 12, 14, 22. Grade Point Assignment. Journal: What do I feel after reading Chapters 12, 14, and 22?

November 12

Holiday - no class

November 14

Topic: Human Dignity. Hand out and do one of the two exercises.

H.W. Chapters 17, 18, 19, 21. Journal: (1) What do I think it would be like to be disabled, minority, etc. or what I know it is like to be disabled, minority, etc. (2) What can I do to heighten my awareness of others on campus?

November 19

Division/Technology Session

November 21

Topic: Stress, Self-Esteem/Exercises)

H.W. Journal - Why am I here? 1 other topic of student's choosing. Finish Journal - Title Page, Table of Contents, Introduction, Conclusion

November 26

Division/Technology Session

Topic: Accomplishments. Refer to goals for autumn in your Journal. Re-list them/fold paper in half and indicate how far you have come. Hand out "You Create It All' and "What Employers Look For." Collect Journals

Library Orientation

September 21 (Friday)	1:00 PM	Agricultural Business Office Management Crop Management Soil Conservation Food Marketing Lab Science
September 28 (Friday)	11:00 AM	Construction
	1:00 PM	Power and Equipment Fluid Power
October 3 (Wednesday)	2:00 PM	Floral Design Nursery Management
	3:00 PM	Beef Production Swine Production
October 4 (Thursday)	2:00 PM	Turfgrass Management
October 5 (Friday)	10:00 AM	Landscape Contracting
	1:00 PM	Dairy Production Horse Production
October 12 (Friday)	1:00 PM	Green Make-up for earlier conflicts

CASE STUDY

Attracting High School Students Through Open House Tours

Wojciech J. Florkowski, C. L. Huang, and Xi-Ling Wu

Abstract

A survey of high school students was conducted during an Experiment Station Open House. Ordered logit procedure was used to test relationships between degree of understanding (1) agricultural research, (2) agriculture's impact on creating jobs, and (3) tour characteristics.

Results suggest that agricultural economists have to develop strategies to better communicate the role and purpose of their discipline. An Open House may increase student awareness of agricultural careers, but further research is needed to assess the impact of tours on attitudes towards agricultural sciences and agricultural economics.

The 1988-89 academic year was associated with celebrations of the Hatch Act which established Agricultural Experiment Stations. Centennial conferences and symposia provided an opportunity to promote the research mission of land-grant universities. The outreach to the general public included invitations to visit in person selected research facilities. At Georgia's Agricultural Experiment Station at Griffin, the public was invited to tour laboratories, offices, library, and greenhouses during a two-day Open House. In order to increase the effectiveness of the message about agricultural research, the day prior to the Open House was a day of special tours prepared for students from local high school. Open House tours helped to communicate the unique characteristics of food and agribusiness important to young people in their selection of college majors (Sonka).

Past studies of high school students' awareness of a community college agriculture programs suggested that students lacked the knowledge about such programs (Reneau and Kabat). The lack of knowledge was wide spread despite location of a college in area where agriculture was important for local economy. Schuster and Constantino found that being interested in a major and being aware of job opportunities were among important factors influencing successful recruiting to a college of agriculture.

Betts and Newcomb reported that high school seniors associated traditional agricultural sciences with college of

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agriculture, but they were less certain that economics was also included in colleges of agriculture. The majority of surveyed high school students were undecided whether social science and computer science courses were offered to agricultural college students. Among their conclusions Betts and Newcomb suggested inviting high school urban students to visit campus facilities. An Open House tour provided a special opportunity to visit an agricultural research facility.

The objective of this paper is to present results of a survey conducted among high school students visiting the Georgia Agricultural Experiment Station. In particular, the authors attempt to identify variables affecting students' understanding of agricultural research, their perception of linkage between job creation and agriculture, and specifics of an agricultural economics display. The link between employment opportunities and agriculture was especially important because of increasing employment of agricultural economics graduates in the agribusiness sector (Sonka and Hudson).

In the opinion of the authors, the agricultural economics profession was at immediate comparative disadvantage in relation to other sciences participating in the Open House. This opinion was based on the assumption that communicating various aspects of sciences is easier if accompanied by examples of machinery and equipment applications. That is, it was easy to capture students' imagination and interest in a discipline if theoretical concepts can be immediately demonstrated by (often hands-on) use of laboratory equipment, display of plants, etc. Demonstration of concepts and applications of agricultural economics requires ingenuity and a thorough preparation.

The Open House tour, organized during centennial celebrations of the Hatch Act, provided a unique opportunity to solicit opinions from high school students. An analysis of the reactions and opinions of students would guide preparations for future tours.

Organization of Tours

The Open House was prepared by scientists working at the Georgia Experiment Station. The display at the Agricultural Economics Department was located in a single conference room. Each group of students was welcomed by the Department's personnel and briefed on the content of the display they were about to see. The display illustrated the link between agriculture and job availability using the example of processing pecans. Two microcomputers (PCs) were also displayed. The monitor of the first PC showed a four-minute sequence of picture and text aimed at informing the public about the nature of agricultural economic work. The second PC was programmed as an interactive question-answer game. The selection of questions was pre-programmed forcing a random choice from a pool of 30 questions.

The visit to the Experiment Station was arranged by Station administration, the Spalding County Board of Education, and Griffin High School Administration and teachers. Griffin is a small town located in the Atlanta metropolitan area and has one high school. The high school has over 2,000 students and all sophomores, juniors, and seniors were invited for a visit. Students were offered two tours through the station. The offer of two tours was dictated by the number of students and the need to complete the visit within a reasonable amount of time. The selection of the tour was randomly determined by the sequence in which school buses brought separate groups. The alternate scheduling assured sufficient time for each group to visit individual displays while preventing groups from interfering with each other.

Survey Data

The survey was conducted by handing questionnaires to teachers who accompanied each student group. The teachers were asked to distribute questionnaires among students after the tour, ask them to answer the questions, collect completed questionnaires and leave them in prepared envelopes at the school office. Each questionnaire included 28 questions. The rate of return was 47.4 percent or 288 usable questionnaires. The questionnaires were distributed and completed by students participating in tour 2 which included the visit to the display of the Agricultural Economics Department.

The questions were designed to solicit students' opinions about their plans to continue education at a university or a college, selecting a major in agriculture, positives and negatives about their tour, specifics of the agricultural economics display, and reasons for not grasping the message of the agricultural economics display.

General sample characteristics are presented in Table 1. The majority of respondents were female (55%). Almost half of participants were 16 years old (43.7%) and 29.6 percent were 17 years old. Finally, the majority (60.8%) of completed questionnaires came from sophomores who represented approximately one half of visiting students. The number of sophomores is relatively large because the drop-out rate at the Griffin High School is around 50 percent.

The Model

The collected information was used for hypothesis testing. Specifically, it was considered valid to identify variables which assisted in communicating to the visiting youth the nature of agricultural research in order to increase visitors' understanding of scientific efforts at the Agricultural Experiment Station.

An important part of the agricultural economics display was an attempt to communicate the link between agriculture

Table 1. General Characteristics of the Surveyed Sample.

Characteristics		Percent
Grade		
	Sophomores	60.8
	Juniors	21.7
	Seniors	17.5
Age		
	15 years	9.5
	16 years	43.7
	17 years	29.6
	18 years	13.7
	19 years	2.8
	20 years	0.7
Sex[a]		
	Male	44.8
	Female	55.2

a. This question was not answered by 30.2% of the surveyed students.

and job creation. The perception of agriculture's impact on jobs is limited to farmers directly involved in growing crops and raising livestock. The public frequently does not realize that the food processing industry, or preparation of farm products for sale, creates jobs that exceed the number of farmers manyfold. In order to further focus visitors' attention on the agricultural economics display, two personal computers (PC) were part of the exposition. Visitors could view the first PC showing repeatedly a four-minute program. The second PC was programmed with an interactive game aimed at involving visitors in the display and challenging their knowledge of Georgia agriculture, the University, and the Agricultural Experiment Station.

The independent variables initially included personal characteristics of respondents. However, after preliminary analyses, characteristics such as age and gender were eliminated because these variables did not contribute to the explanatory power of the models. The only retained personal characteristic was a measure of a student's grade and, on one occasion, gender. Other independent variables included in the models measured attitudes (e.g. not interested in economics), perceptions, and behavior (e.g. talking to friends during the tour). Variables measuring attitudes and behavior were expressed as scales. For example, the questions inquiring about students' interest in economics allowed respondents to choose among several alternatives: "agree," "somewhat agree," "don't agree," and "don't know." Similar categories were assigned to dependent variables making the ordered logit procedure suitable for model estimation.

The models were estimated using ordered logit procedure. Order logit applies to cases where the dependent variable falls into categories in an ordered manner. For instance, a person's degree of agreement with a statement can be categorized by a scale from one to four. The response model is defined

$$y^* = \beta' x_i + u_i \ (i = 1, z .. n) \qquad (1)$$

where y* is the dependent variable; and X is a matrix of independent variables; / is a vector of coefficiencies and u is a vector of residuals. y* is unobservable, but it is known that each individual in y* falls into one of m ordered categories. The model was developed by Aitchison and Silvey, Ashford, Gurland et al. and Cox. It was also elaborated by Maddala.

Results

Estimation results are presented in Tables 2 - 4. The final form of the specified models was achieved using iterative selection procedure. This method of model specification may distort the probability levels used for determining the significance level of estimated coefficients.

Understanding agricultural research.

Results (Table 2) suggest that female high school students agreed more frequently with a statement that the tour increased their understanding of agricultural research. Few students could specifically recall visiting that display when completing questionnaires. The majority of respondents disagreed with statements that displays contained "too much text" or that they "don't like computers."

Table 2. Ordered Logit Results Concerning Students' Understanding of Agricultural Research.

Dept. variable name	Independent variable name	Coefficient	Asymptotic t-ratio
Understanding agri. research	Senior	-.6549	-1.42
	Sex	.5445	1.85*
	Remember Agri. Economics display	-2.1931	-5.44*
	Too much text on exhibits	.5774	2.66*
	Don't like computers	.4544	2.12*
	Friends distracted my attention	-.1981	-.82

* Significant at $\alpha = .1$

Jobs and agriculture.

The link between jobs and agriculture (Table 3) was stressed at the agricultural economics display, yet many students did not remember visiting the Agricultural Economics Department display. However, descriptive results indicate that the respondents were generally interested in economics. Surveyed students agreed with statements that they understood farmers' need to make production and marketing decisions and that they had a sufficient amount of time to see the exhibits.

Computer game.

According to estimation results (Table 4), respondents did not have sufficient time to enjoy the computer game. This result was expected because few students had a chance to answer a full round of questions. The tour scheduling did not allow for everybody to try it, although students were encouraged to come back on their own. The respondents did not associate the computer game uniquely with the agricultural economics display. Respondents also disagreed with a statement that "friends distracted their attention."

Implications

The administration of the Georgia Agricultural Experiment Stations is considering future Open House events

Table 3. Ordered Logit Results Concerning Student's Opinion Linking Jobs Creation and Agriculture.

Dept. variable name	Independent variable name	Coefficient	Asymptotic t-ratio
Agriculture creates jobs	Constant	-1.8657	-2.21*
	Senior	-.4206	-.96
	Not interested in economics	.4144	2.68*
	Understand that farmers make production and marketing decisions	1.2320	6.16*
	Remember Agri. Economics display	-1.2796	-3.59*
	Talked to friends during tour	-.3615	-1.53
	No sufficient amount of time	.4104	2.31*

* Significant at $\alpha = .1$

Table 4. Ordered Logit Results Concerning Visit to Agricultural Economics Display Computer Game.

Dept. variable name	Independent variable name	Coefficient	Asymptotic t-ratio
Enjoyed playing computer game	Constant	-1.7475	-2.83*
	Senior	.3154	.92
	Not sufficient amount of time	.7254	4.54*
	Remember agri. economics' display	-.8629	-2.72*
	Friends distracted my attention	.3387	1.69*

* Significant at $\alpha = .1$

including invitations to high school students to visit the Station. A visit to an experiment station generally focuses on research activities of a college of agriculture rather than teaching. Communicating research efforts may be more complicated than communicating teaching activities because of the variety of methods used in agricultural research. Agricultural economics may be especially difficult for presentation to a lay audience because of the use of abstract concepts and simplifying assumptions in describing economic relationships. Difficulties in teaching abstract economic theory have been noticed so mechanical models were introduced into classroom (Broder). An attempt to introduce students to agricultural economic research through a short PC program and a computer game may have been insufficient because computers are not unique to agricultural economic research.

Although students claimed to be interested in economics, only a few remembered the agricultural economics display. This study could not ascertain whether the student's lack of recall was unique to the agricultural economics display or included other displays as well. However, earlier studies in marketing and consumer research suggest that consumers have problems when asked to recall their purchasing behavior (MacNeary). Similar to consumers' attitudes towards a product, high school students' attitude towards a particular career may influence their educational choices.

It is plausible that an open house tour was memorized and could affect the judgement processes. For attracting high school students into the agricultural economics major at colleges of agriculture it is important that students form positive impressions of agricultural economics as they receive information. Assuming that this memory-for-attitude model (Loken and Haverstad) is applicable further research is needed to identify what factors influence students attitudes during interactions with agricultural economics displays.

Table 5. Ordered Logit Results Concerning Students' Enjoyment from Out-of-School Tour.

Dept. variable name	Independent variable name	Coefficient	Asymptotic t-ratio
I enjoyed tour because I could leave school	Constant	-2.1290	-3.15*
	Senior	.6415	1.83*
	I did not like the fact that I had not enough time to see exhibits	-.1965	-1.25
	Too much text on exhibits	.3098	2.00*
	Friends distracted my attention	.4083	1.80*

* Significant at $\alpha = .1$

Survey results may suggest also that students tend to selectively remember (or forget) various parts of the tour (Singh et al.). The statement by respondents that they are interested in economics but did not remember agricultural economics display may suggest that students' behavior followed the "threshold theory." The "threshold theory" implies that recognition of an item, or agricultural economics display, requires lower threshold of familiarity than recall (Kintsch). In the case of this study, students may have not distinguished between economics and agricultural economics while forming positive attitudes towards economics.

One solution to this lack of student recall would be to develop a unique association between agricultural economics in the form and content of the communicated message. The word "agribusiness" may be more easily understood by high school students than "agricultural economics." An "agribusiness" display would still contain the same basic ideas while stressing business application of agricultural economic research.

The difficulty of recognizing agricultural economists educated in agricultural economics department by employers was illustrated by Broder and Houston. Broder and Houston found that many employers perceived agricultural economics graduates as agribusiness graduates and did not associate them with agricultural economics programs.

The lack of immediate results does not eliminate the possibility that some students will be affected by an open house tour in their vocational and educational choices. Kohl, et al., suggested that some vocational and educational choices are influenced by parents and guidance counselors. Perhaps in future events, more attention ought to be paid to possibilities of inviting students and parents together and have an extra tour for high school counselors.

Future research should focus on attitude perception of high school students of agribusiness and agricultural economics and test alternative forms of communicating the nature of a career in agricultural economics.

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Florkowski (continued on next page).

A Capstone Problem Solving/Systems Course at a Two-Year Technical College

Allen P. Zimmerman

Abstract

The course described in this article is based on the National Agricultural and Natural Resources Curriculum Project, Food and Agricultural Systems Task Group. However the course content was modified to meet the needs of students and curricula at a two-year technical college. Course topics include the hierarchy of four problem solving approaches, creative and critical thinking, communication skills, learning styles, personality types, and decision making. Development of the course, its content and structure, and results based on its initial offering are discussed.

Introduction

The importance of and techniques for incorporating systems approaches to problem solving in baccalaureate curricula have received considerable attention in recent years. A major contributor to implementation of successful problem solving/ systems courses has been the workshop/manual combination entitled "Systems Approaches to Food & Agricultural Problems" developed by members of the Food & Agricultural Systems Task Group of the National Agricultural & Natural Resources Curriculum Project (1986). Soft systems techniques in particular are emphasized. Several faculty training workshops have been conducted throughout the USA. I attended the 1987 workshop held at North Carolina State University.

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Florkowski (continued from previous page).

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Incorporation of these problem solving/systems concepts in baccalaureate coursework, curricula, and programs have been discussed by several authors including Hoshmand (1988), Merritt and Wilson (1990), and Murphy et al. (1990). An excellent textbook for an upper level course based on the workshop/manual has also been published (Wilson and Morren, 1990).

After moving from a teaching position at a four-year college to a division chair position (Engineering Technologies) at a two-year technical college, I was confronted with the challenge of adapting the problem solving/systems concept to students and curricula at the associate degree level. Clearly the rationale for the need to incorporate this material into the learning process in baccalaureate programs (Merritt, 1984; Wilson, 1986) applies to technical college students as well. However, given the applied nature and short time frame of two-year technical curricula; modifications in course content and orientation are required to make the topics appropriate at the technical college level.

Course Development

A basic concept incorporated in the systems model for problem solving is that there is a hierarchy of four major problem solving approaches (Bawden, 1986; Wilson and Morren, 1990). Listed from the most reductionistic to the most holistic, these techniques are identified as 1. the scientific method, 2. application of technology, 3. hard systems, and 4. soft systems. Given the course content and selection in technical curricula, students' interests and orientation, and the career opportunities for graduates; I decided that only the application of technology and certain aspects of the soft systems approaches should be emphasized (although all would be discussed) in a problem solving/systems course designed for associate degree programs. However for all other topics typically incorporated in problems solving/ systems courses taught at the baccalaureate level, such as creative and critical thinking, communication skills, learning styles, personality types, and decision making; there would be no difference between the courses.

I recommended to Engineering Technologies Division faculty that the proposed problem solving/systems course be required for all Division students and scheduled as a capstone course in the curricula. This recommendation was incorporated as part of the overall Division curriculum revision proposal which was approved by the faculty. Official approval of the course, Engineering Technologies T292, "Problem Solving Using Systems Approaches", was obtained via the standard University Academic Affairs process. The course was offered for the first time during Spring Quarter, 1990.