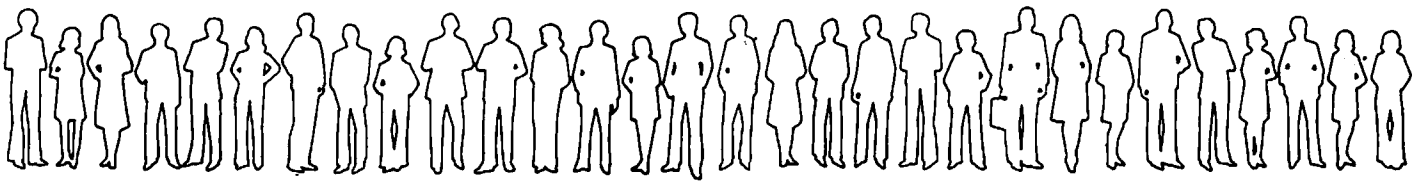

CASE STUDY: Changes in Student And Employment Opportunities Challenge Agricultural Curricula

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Introduction

One of the potentially serious problems faced by educators in Agricultural Colleges is the changing background of students entering the colleges and the changing job market for graduates of agricultural programs (1, 2). If changes are occurring to a sufficient degree, then administrators must explore altering current programs to adapt to the new environment. Few studies (3, 4) have documented the change; thus, decisions are often made without a solid data base.

The administration in the College of Agriculture, University of Maryland, recognized the need for better information on student backgrounds and job opportunities and supported a study to examine the issue. This paper presents a portion of the findings of that study and may be useful to others concerned with the general problem. Although Maryland may not be perfectly representative of all agricultural colleges, it is probably representative of many of the land-grant colleges, particularly the schools in the Northeast.

Materials And Methods

The findings are based on a survey of alumni and graduating seniors. The survey yielded a 40 percent response rate from 700 randomly selected alumni who graduated between 1976 and 1980. Also, from a separate mailing, 123 alumni from the graduating classes prior to 1970 responded and 52 alumni in the graduating classes from 1970 to 1975. In addition, 62 graduating seniors from the classes of 1980 and 1981 were interviewed. The sampled population may not be representative of the entire College since students not graduating were not contacted nor were funds available to examine non-respondent backgrounds.

Results And Discussion

Students enter the College of Agriculture with a variety of backgrounds. To understand some of that variety, several background questions were asked on our survey of alumni and graduating seniors. The information of particular interest was associated with the student's early environment (e.g., rural, urban), their sex, their reasons for entering the College program, and their environment after graduation. This information relates the types of students entering the program, their interests in the program, and where they will likely reside after graduation.

Table 1. Background Information for Alumni[1] and Graduating Seniors[2]

Information	Responses of Alumni and Graduating Seniors 1976-1980	Responses of 1970-1975 Alumni	Responses of pre-1970 Alumni
	%		
Early Environment			
Rural	20	44	66
Suburban	73	52	25
Urban	5	4	9
Foreign	2	0	0
Factors Influencing Choice of Major			
Parents	7	6	22
Alumni	1	1	7
Peers	7	15	8
University Publicity	5	4	4
Program's Applied Nature	37	31	18
Job Opportunities	15	19	16
Other	28	23	25
Sex			
Male	55	80	96
Female	45	20	4
Current Residence			
Maryland	64	52	57
Other U.S.	34	46	43
Foreign	2	2	0
Environment in which You Reside			
Rural	25	39	40
Suburban	64	54	49
Urban	10	6	11
Foreign	1	0	0

[1]Responses tallied from 551 respondents of a mail survey.
[2]Responses from 42 personal interviews with members of the class of 1980.

Table 1 contains aggregate responses from our mail and personal surveys. It presents the percentage of respondents which answered questions in a specific manner and also disaggregates them into different graduation periods. In the first column, alumni and graduating seniors from classes of 1976 to 1980 are shown, with subsequent classes combined in a 1970-75 grouping and a pre-1970 grouping. The division into groups was done primarily to observe time changes that occurred over the sample. The alumni from the College

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tend not to have urban backgrounds, a finding which is consistent over time. Fewer than 10 percent were reared in an urban setting. Rural and suburban environments were consistently the childhood environment of 90 percent of respondents. Interestingly, suburban backgrounds now account for nearly 75 percent of recent College alumni but represent only 25 percent in the pre-1970 respondents. Rural backgrounds, on the other hand, have been reduced from 66 percent of the sample down to 20 percent of the respondents. Clearly, the student background has changed and, more importantly, much of the change has occurred in alumni since 1970.

To examine the varied student background among the majors, the group of the most recent graduates (1976-1980) was separated by major. Agricultural and Extension Education and the General Agriculture degree programs still have over 50 percent of their students with rural backgrounds. On the other hand, Animal Sciences and the Conservation and Resource Development program had over 80 percent of their students with suburban backgrounds. The Horticulture program had 75 percent from suburbia with the Agronomy program having about 65 percent.

Factors influencing students to choose the College of Agriculture are varied, but many (over 30 percent) of the post-1970 alumni responded that the applied nature of the program was a primary factor. This differs from the pre-1970 respondents who indicated that parents and alumni influenced their choice (approximately 30 percent). University publicity does not appear to attract many students although there has not been a substantial publicity effort by the College. There was also little difference between the 1970-75 and 1976-80 groupings, except peer influence appears to be decreasing. There was little difference among the majors for the 1976-1980 group except that few alumni from the Conservation and Resource Development major were attracted by job opportunities.

The shift in the percentage of female respondents was also dramatic. The pre-1970 group had 95 percent male responses whereas the 1970-75 male percentage was 80 percent and the 1976-80 percentage was 55 percent. General Agriculture and Agricultural and Resource Economics had the smallest percentage of females (fewer than 20 percent) whereas Animal Science had the largest percentage (69 percent).

Employment Information

In addition to investigating students' backgrounds and their post-graduation residences, the survey also obtained information on employment and income (Table 2). Employment was highest for the pre-1970 graduates with only 3 percent unemployed. The post-1970 grouping were 6 percent unemployed and the 1976-80 alumni were 9 percent unemployed. This may be upwardly biased because of the 1980 class not having time to find jobs prior to responding.

From the survey, the largest employer of College graduates is the government. Nearly one-third of all respondents were government employees, a percentage twice that of other job categories. Agricultural production and agribusiness employment represented approximately 25 percent of the alumni. A growing percentage is shown in the area of non-agricultural private business and the "other" category. When examined by major, several majors were related to particular jobs. For example, nearly one-third of Agronomy (Crops) majors were employed in agricultural production whereas no Agronomy (Soils) were in this area. Fifty percent of the Agricultural Economics majors were in agribusiness. Government employed 50 percent of the Agronomy's (Soils) responding alumni and 47 percent of the responding Conservation and Resource Development alumni.

The mean income levels rose with time since graduation. The mode of the distribution rose from $10,000-15,000 for the 1976-1980 group to $15,000-25,000 for the 1970-75 group to $25,000 to $35,000 for the pre-1970 group. Surprisingly, there was not a substantial spread in income among the majors. The distributions with the highest income were Agriculture Chemistry and the Conservation and Resource Development major. The smallest range in distribution was in the Agricultural and Extension Education major where nearly 90 percent of the respondents had income between $10,000 and $15,000.

Table 2. Job Related Information for Alumni[1] and Graduating Seniors[2]

Information	Responses of Alumni and Graduating Seniors 1976-1980	Responses of 1970-1975 Alumni	Responses of pre-1970 Alumni
		%	
Employed			
Full-time	86	86	91
Part-time	5	8	6
Unemployed	9	6	3
Occupation			
Agri. Prod.	13	12	11
Agribusiness	12	4	16
Government	27	31	30
Veterinarian	1	8	1
Homemaker	2	4	1
Education	6	12	15
Non-Ag. Private Bus.	17	10	14
Other	22	20	13
Income Level			
0-$4,999	13	6	2
$5,000-9,999	10	14	2
$10,000-14,999	39	12	7
$15,000-24,999	34	38	22
$25,000-34,999	2	20	26
$34,000-49,999	0	8	23
$50,000-over	1	0	18

[1]Responses tallied from 551 respondents of a mail survey.
[2]Responses from 42 personal interviews with members of the class of 1980.

Summary

Agricultural curricula often must change in response to the changing needs of the students, both in their backgrounds and likely job opportunities. At the University of Maryland, backgrounds have changed substantially within the last ten years and the jobs in which students will be working are changing. It will be necessary to design and modify programs to offer the student a more satisfying and rewarding college experience.

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Modular Instruction For A Horticulture Service Course

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Abstract

Large enrollment service courses pose numerous teaching problems. A package of instructional modules was developed for a horticulture service course, Indoor Plants, to improve the efficiency of departmental resources while providing quality instruction for a diverse clientele.

As at other colleges and universities, the number of horticulture majors at Virginia Tech has increased dramatically in recent years. This increase has been accompanied by an equally impressive increase in the number of non-majors in horticulture courses. A number of departments, Virginia Tech included, have developed service courses designed to provide basic, practical instruction for non-horticulturists. Service courses as such have been somewhat controversial in academe (1). The authors believe that service courses have a place in horticulture curricula, although admittedly such courses should not be developed and taught at the expense of departmental required courses.

The Virginia Tech Horticulture department offers four service courses ranging from Home Vegetable Production to Basic Floral Design. One of the most popular service courses is Indoor Plants; quarterly enrollment often exceeds 200 students. Approximately 95 percent of the students are non-majors and 90 percent from outside the College of Agriculture and Life Sciences.

Table 1. A comparison of exam grades of four sections of "Indoor Plants" Horticulture 2080 taught by faculty and GTA's and using a new teaching strategy.

Course Sections	Plant I.D. Exam Average	Quiz Average	Final Exam Average
#1 Faculty	96.1 ab[1]	79.7 a	85.8 ab
#2 GTA	98.3 a	81.8 a	87.9 a
#3 GTA	93.8 ab	76.8 a	83.6 b
#4 GTA	92.9 b	81.1 a	82.4 b

[1] Mean separation in columns by Duncan's Multiple Range Test; 5% level.

Even though Indoor Plants was a very popular course, flaws became apparent. Most students were not prepared for the vast amount of memorizing required to enter a totally new discipline such as horticulture. The popularity of the course required the department to offer multiple sections which imposed a serious drain on faculty teaching time sorely needed in advanced horticulture courses. We decided to redesign the course with the following goals: 1) retain a high level of student interest, 2) ensure the relevance of course objectives to student needs, (3) develop more effective instructional techniques, and (4) make more efficient use of faculty teaching time.

A needs assessment was conducted to determine the horticultural knowledge of entering students, the learning characteristics of the various groups enrolling in the course, and the attitudes of the students toward existing and potential instructional methodologies employed in the course. Analysis of pre-tests established an average entry knowledge of subject matter which aided in the restructuring of course content and in setting levels of difficulty. Analysis of class rosters and student interviews established a profile of the students, including majors, backgrounds, experience with plants, and purposes for enrolling in the course. Questionnaires and interviews of the students indicated their positive and negative attitudes about individual instruction methodologies and instructional strategies. As a result of the needs assessment the following principles for change were adopted:

1. **Course content should be directed toward non-majors. Horticulture majors should be discouraged from enrolling in this course.**
2. **The class should be taught in multiple sections of fewer than 40 students meeting twice a week for one hour and fifteen minutes each.**
3. **The course must be redesigned to enable graduate students to replace faculty without loss of teaching effectiveness.**
4. **High student interest should be emphasized but without relaxation of course content rigor and maximum challenge.**
5. **Hands-on experience, demonstration, and discussion should be emphasized as instructional methodologies.**
6. **Instructional objectives should be published to ensure a direct relationship between objectives and evaluation.**
7. **Texts and materials should be of minimal cost.**

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