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# Use of Alumni Survey in Curriculum Development

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The course of collegiate study greatly influences a student's chances for career success. For this reason, the establishment of a curriculum is an important task facing horticultural educators. In fact, curricular quality determines the integrity of the entire educational effort.

The horticulture curriculum requires regular evaluation because of changing student needs. Traditionally, faculty have reviewed the curriculum and have made appropriate changes depending upon their own observations. In recent years, an attempt has been made to improve this process by involving others. For example, task forces have been formed at the national level to assess groups representing education, government, business and industry to determine student's needs and to establish curricular priorities (4).

However helpful task force recommendations may be, at times faculty must face curricular decisions unique to their own institutions. In such situations, alumni represent valuable resources. As products of the educational institution involved, alumni are in an advantageous position to judge both the quality and adequacy of their education (3,7,8). They are able to identify both strengths and weaknesses in curricular composition based upon career experiences. The purpose of our investigation was to involve alumni in curricular evaluation and development through the use of a survey.

## Survey Methods

An explanatory cover letter and a trifold self-mailing survey with affixed return postage requesting demographic data and options about their horticultural education and employment since graduation was mailed to 351 horticultural alumni of the University of Missouri-Columbia in July, 1985. All of the horticultural graduates between the school years of 1979-80 through 1984-85 were included. We purposefully chose to survey by mail so that our respondents would feel free to give their honest opinions in complete anonymity. There were 162 interpretable responses to this survey, or a 47% return rate. Six surveys were returned as undeliverable by the post office. Since the

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responses were anonymous, no follow-up contacts were made.

The survey was divided into 2 sections: (a) demographic questions which were forced-choice blanks, as well as short answer questions, and (b) survey of opinion questions that employed the Likert Scale (5), in addition to short answers (Fig. 1). Some short answer questions were also designed to prompt suggestions or anecdotal comments. The Likert Scale was used to elicit various degrees of responses to each question. These questions were written so that approximately half were presented positively and half negatively; all were scattered at random throughout the survey. Each Likert question addressed only one topic in a succinct manner (i.e., the average length per question was 13.9 words). To verify alumni opinion on certain key topics, 2 questions — each worded differently and separated in the instrument — were asked concerning the same topic. A tally of the data, converted to percentages, served as the basis from which most conclusions were drawn.

## Results and Discussion

### Theory vs. Applied Curriculum

Traditionally, the purpose of a curriculum is to develop technical skills or to increase the knowledge base in the arts and sciences, thus nurturing a life-long learning process (6). This dichotomy of training versus educating a student is discussed in horticultural circles. The perception is that horticulturists train more than educate, resulting in horticultural courses being far too applied while lacking sufficient theory.

Our survey contained 2 questions designed to determine alumni attitudes toward this dichotomy. Sixty-two percent of the respondents indicated they thought their education was well-balanced between basic theory and practical, applied learning (Table 1, survey question #2). This opinion was verified by the response to a second question on the same topic (Table 1, survey question #27). Seventy percent of the respondents felt their horticulture courses were intellectually challenging (Table 1, survey question #12).

There were no trends relating cumulative grade point average with a perceived well-balanced horticulture curriculum (Table 2). The response was similar concerning a well-balanced horticulture curriculum as related to the size of place of upbringing (Table 3).

The responses from the survey questions designed to elicit anecdotal comments verified the above findings. "Good program with a fairly good balance of academic and applied knowledge" was a typical reply. Others suggested that applied, practical exercises should be increased, for such experiences made it easier "to relate theory to practical knowledge."

#### Ability to Analyze and Solve Problems

The development of a "thinking student," able to analyze and solve problems successfully, is one stated objective of the National Curriculum Project Task Force (4). According to Bloom, problem solving represents the highest level of thinking in his Taxonomy of Educational Objectives (2). Our survey results indicated that a large majority (82%) of the respondents felt their horticulture educational experience enabled them to analyze and solve problems better (Table 1, survey question #29). Alumni attitudes toward problem solving were not dependent on cumulative grade point average (Table 4), nor on the size of place of upbringing (Table 5).

Eighty-seven percent of those currently working in horticulture thought their horticultural education increased their problem-solving ability (Table 6). Sixty-three percent of those graduates currently employed in non-horticultural positions agreed that their horticultural education enhanced their problem-solving ability (Table 6).

A comparison was made between the quality of educational preparation for the working world and the perception of having improved problem-solving ability due to horticultural education. Seventy-four percent of the alumni who felt positively about their job preparation agreed that their horticultural education increased their problem-solving skills (Table 7). Our results indicate that skillful problem solving is an important factor for successful career preparation.

One respondent observed: "UMC's Horticulture program provided me with a solid foundation with which to understand my field better. I feel I do a better job because I understand why things work the way they do. Once I know this, I can better solve my problem."

#### Basic Science Courses

The number of required basic science courses is debated when establishing undergraduate curricula. The concern over this matter was also reflected in our respondents' comments.

Using chemistry as an example of a basic science, our survey queried our graduates concerning the importance of such courses for career success. Fifty-three percent indicated they felt that chemistry was important, while 36% indicated it was not (Table 1, survey question #9). These responses were directly related to the number of chemistry courses taken. For example, only 41% of those alumni having only one chemistry course felt chemistry was important; whereas 94% of those having taken 4 or more courses thought chemistry was important (Table 8). This difference may be attributed to varying career demands.

**Table 1. Summary of selected survey questions and responses.**

Survey Question	Strongly agree	Disagree	No opinion	Agree	Strongly disagree
2. I feel that my horticultural education was well-balanced between theory and practical learning.	14 <sup>z</sup>	48	10	26	2
4. Insufficient coursework in the basic sciences (e.g., chemistry) is hindering me now.	7	11	12	55	15
9. I consider chemistry courses to be very important for my career success.	15	38	11	31	5
12. My courses in horticulture were not intellectually challenging.	6	16	8	53	17
19. I consider undergraduate business courses to be very important for my career business.	31	39	17	10	3
27. I feel that my horticulture courses placed too much emphasis on practical, applied learning.	2	10	10	46	32
29. My educational experience in horticulture has enabled me to analyze and solve problems better.	29	53	10	7	1

<sup>z</sup> percentage response of total.

**Table 2. Relationship between perception of curriculum balance and cumulative grade point average.**

GPA	% Response by GPA Category				
	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
2.00-2.50	0	56	22	22	0
2.51-3.00	13	52	8	25	2
3.01-3.50	18	44	6	28	4
3.51-4.00	10	40	20	30	0

**Table 3. Relationship between perception of well-balanced curriculum and place of upbringing.**

Place of Upbringing	% Response by Background				
	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
Rural	19	47	6	28	0
Suburb	9	44	13	30	4
Town	19	62	3	16	0
Metro	11	37	21	31	0

**Table 4. Relationship between perception of enhanced problem-solving ability and cumulative grade point average.**

GPA	% Response by GPA Category				
	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
2.00-2.50	33	45	11	11	0
2.51-3.00	36	39	12	12	1
3.01-3.50	24	61	13	2	0
3.51-4.00	20	70	7	3	0

**Table 5. Relationship between perception of enhanced problem-solving ability and place of upbringing.**

Place of Upbringing	% Response by Background				
	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
Rural	17	72	8	3	0
Suburb	28	47	12	12	1
Town	44	37	16	3	0
Metro	32	63	5	0	0

**Table 6. Relationship between perception of enhanced problem-solving ability and current occupational status.**

Current Occupation	% Response by Occupational Category				
	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
Horticultural	31	55	8	5	1
Non-Horticultural	21	42	24	13	0

**Table 7. Relationship between perception of educational preparation for the first job and improved problem-solving ability.**

Preparation for First Job	% Response by Preparation Category				
	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
Very well	56	44	0	0	0
Well	30	56	9	5	0
Average	20	55	17	8	0
Poor	27	18	19	36	0
Very Poor	0	33	34	0	33

**Table 8. Relationship between perception of importance of chemistry for career success and chemistry courses taken.**

Chemistry Courses Taken	% Response by Chemistry Courses Taken				
	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
1	8	33	16	38	5
2	13	45	5	29	8
3	36	46	9	9	0
4 or more	44	50	0	6	0

**Table 9. Relationship between perception of being hindered by insufficient coursework in chemistry and chemistry courses taken.**

Chemistry Courses Taken	% Response by Chemistry Courses Taken				
	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
1	6	12	13	52	17
2	8	8	7	61	16
3	9	9	19	63	0
4 or more	13	7	7	60	13

**Table 10. Relationship between desire for additional business courses and business courses taken.**

Business Courses Taken	% Response by Business Courses Taken				
	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
1	31	31	14	22	2
2	31	31	19	13	6
3	26	45	13	16	0
4 or more	24	24	13	35	4

Alumni following more science-oriented careers in horticulture may have taken more chemistry courses and consequently regarded chemistry with increased importance. One respondent wrote: "I can't stress enough a good grounding in the basic sciences." Another commented: "When you run across a problem that is difficult, you have to rely on a general knowledge of the basic sciences to get a grip on what is involved."

Interestingly, although chemistry was perceived to be important by a majority of respondents, only 18% felt hindered by insufficient chemistry coursework (Table 1, survey question #4). This attitude was held irrespective of the number of chemistry courses taken (Table 9).

### Business-Related Courses

Business management courses are also important. Educators and industry alike have encouraged their inclusion in the curriculum (1,6). Our survey sought to determine alumni opinion of this importance. Seventy percent considered business courses to be very important for their career success (Table 1, survey question #19). One respondent said: "More independent business entrepreneur skills would be helpful. Many would like their own business, yet don't know what is involved or where to start."

Regardless of the number of business courses taken, our respondents wished that they had taken more (Table 10). The perception of the importance of business courses was related to the number taken. Fifty-six percent of those with only one business course believed such courses to be important for their career success; whereas 87% of those with 4 or more courses believed them to be important (Table 11). Presumably, those who had taken more of such courses were in business-related careers, and dependent upon a strong business background for career success.

One alumnus summarized the significance of this area: "Emphasis should be placed on business skills. Knowing plants is fine, but in the real world that is only one part."

### Conclusions

The survey results have proven useful in horticultural curricular evaluation here at the University of Missouri-Columbia. Our department regularly reviews its curriculum. Several new concerns were raised during the most recent evaluation, prompting the formulation of this survey. Our alumni provided

**Table 11. Relationship between the perception of the importance of business courses and business courses taken.**

Business Courses Taken	% Response by Business Courses Taken				
	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
1	28	28	19	17	8
2	16	41	31	12	0
3	26	61	10	3	0
4 or more	50	37	9	4	0

valuable feedback which helped our department evaluate and analyze these concerns in a relevant manner.

Our initial concern questioned the curricular balance between basic theory and applied knowledge. Our alumni thought the blend was good. Therefore, a decision was made to retain the current blend of practical, "hands-on" courses and theoretical courses.

Our second concern centered around our graduates' ability to solve problems. In fact, our departmental teaching philosophy is to produce a thinking student with sufficient analytical skills to effectively solve problems. A large majority of our alumni indicated they felt that their horticultural education enhanced their problem-solving ability. This feedback was reassuring and substantiated our decision to continue stressing analytical proficiency in both curriculum selection and course content.

The third area of concern dealt with the optimum number of basic science courses (i.e., chemistry) to be taken. Despite our respondents' opinions doubting the need for such additional courses, our department opted to strengthen its chemistry requirement. This decision reflected our department's conviction that a solid foundation in the basic sciences will become increasingly important for career success in horticulture.

Alumni perceptions of business-related courses was our final area of concern. Are our graduates adequately prepared to manage the business end of horticulture? Most respondents expressed a desire to have taken additional business courses. Because of this response, our department decided to place new emphasis on the incorporation of additional business-related courses in each student's program of study.

Because they are products of the particular institution involved, alumni are in a unique position to provide helpful feedback when analyzing and evaluating horticultural curricula. Decisions to add or delete courses, to expand or consolidate course content, or to adjust basic curricular philosophy can all be facilitated by alumni input. A properly structured survey is one satisfactory method of obtaining alumni opinion to aid in curriculum development.

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### Figure 1. Survey sent to UMC horticulture alumni.

#### DEPARTMENT OF HORTICULTURE ALUMNI SURVEY DEMOGRAPHIC INFORMATION

(Confidential - do not sign name)

Directions: Please check the blanks and fill in the spaces as appropriate.

- I am:  male  
 female
- My age is  years.
- My year of graduation from UMC was .
- My undergraduate area of horticultural interest was:
  - floriculture
  - fruit/vegetables
  - landscape design
  - nursery crops
  - turf
- My cumulative grade point average as a horticulture undergraduate student was between:
  - 2.00-2.50
  - 2.51-3.00
  - 3.01-3.50
  - 3.51-4.00
- My current annual gross income is:
  - under \$10,000
  - \$10,000-\$15,000
  - \$15,000-\$20,000
  - \$20,000-\$25,000
  - \$25,000-\$30,000
  - over \$30,000
- I was mostly raised:
  - in a rural place
  - in the suburbs
  - in a town or urban place
  - in a metropolitan place
- I currently live:
  - rural
  - suburbs
  - town or urban
  - metropolitan
- How many chemistry courses did you take as an undergraduate?
  - 1 course
  - 2 courses
  - 3 courses
  - 4 or more courses
- How many business courses did you take as an undergraduate?
  - 1 course
  - 2 courses
  - 3 courses
  - 4 or more courses
- Please indicate the extracurricular activities or organizations you participated in while a UMC undergraduate student:
 

<input type="checkbox"/> Hort Club	<input type="checkbox"/> Social fraternity or sorority
<input type="checkbox"/> Alpha Zeta	<input type="checkbox"/> Musical activities
<input type="checkbox"/> Gamma Sigma	<input type="checkbox"/> Religious activities
<input type="checkbox"/> Delta	<input type="checkbox"/> Student government
<input type="checkbox"/> Student government	<input type="checkbox"/> Intramural athletics
- Other: \_\_\_\_\_
- Did you hold a part-time job while attending UMC?
  - no
  - yes, please state average hours per week you worked \_\_\_\_\_

13. After graduating from UMC, have you ever been employed in a horticulture-related vocation?  
 \_\_\_\_\_ no  
 \_\_\_\_\_ yes, please state number of years \_\_\_\_\_  
 \_\_\_\_\_ yes, self-employed state number of years \_\_\_\_\_
14. What is your current primary occupation?
15. Please state any other horticultural involvement.
16. Do you clearly recall courses that have been helpful to you?  
 \_\_\_\_\_ no  
 \_\_\_\_\_ yes, please specify: \_\_\_\_\_
17. Do you clearly recall courses that have not been helpful to you?  
 \_\_\_\_\_ no  
 \_\_\_\_\_ yes, please specify: \_\_\_\_\_
18. What should be the minimum chemistry requirement for horticulture majors?  
 \_\_\_\_\_ none  
 \_\_\_\_\_ 1 course  
 \_\_\_\_\_ 2 courses  
 \_\_\_\_\_ 3 courses  
 \_\_\_\_\_ 4 or more courses
19. What was the title of your first full-time job following graduation?
20. Generally speaking, how well did your academic program prepare you for your first job after graduation?  
 \_\_\_\_\_ very well  
 \_\_\_\_\_ well  
 \_\_\_\_\_ average  
 \_\_\_\_\_ poorly  
 \_\_\_\_\_ very poorly

#### SURVEY QUESTIONS

Directions: Please read each of the following statements and circle the number corresponding to your FIRST reaction concerning your opinion. As you answer each statement, try not to look back at previous items.

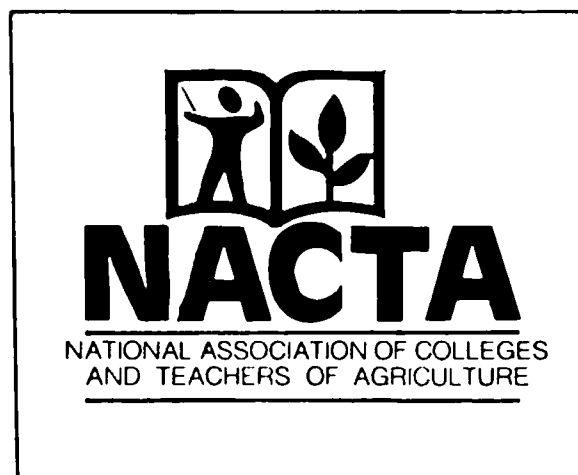
Your opinion of each statement is important, since there are no "right" or "wrong" answers.

- |  | Strongly agree | Agree | No opinion | Disagree | Strongly disagree |
|--|----------------|-------|------------|----------|-------------------|
| 1. My overall educational experience at the University of Missouri was worthwhile.                       | 1              | 2     | 3          | 4        | 5                 |
| 2. I feel that my horticultural education was well-balanced between theory and practical learning.       | 1              | 2     | 3          | 4        | 5                 |
| 3. The Department of Horticulture did not offer me adequate job placement assistance.                    | 1              | 2     | 3          | 4        | 5                 |
| 4. Insufficient coursework in the basic sciences (e.g., chemistry and math) is hindering me now.         | 1              | 2     | 3          | 4        | 5                 |
| 5. 'Ornamental Woody Plants I' and 'Ornamental Woody Plants II' should be combined into a 3 hour course. | 1              | 2     | 3          | 4        | 5                 |
| 6. I wish that I had taken more business courses when I was a student.                                   | 1              | 2     | 3          | 4        | 5                 |
| 7. A course in plant nutrition should be required of all horticulture majors.                            | 1              | 2     | 3          | 4        | 5                 |
| 8. I feel the greenhouses and lab facilities in the Department of Horticulture are inadequate.           | 1              | 2     | 3          | 4        | 5                 |
| 9. I consider chemistry and math courses to be very important for my career success.                     | 1              | 2     | 3          | 4        | 5                 |
| 10. The Department of Horticulture tries to offer too many courses.                                      | 1              | 2     | 3          | 4        | 5                 |
| 11. I would have liked to do an in-depth study or independent research as an undergraduate.              | 1              | 2     | 3          | 4        | 5                 |
| 12. My courses in horticulture were not intellectually challenging.                                      | 1              | 2     | 3          | 4        | 5                 |
| 13. I feel that all horticulture majors should be urged to do an internship as an undergraduate.         | 1              | 2     | 3          | 4        | 5                 |
| 14. I would be interested in receiving a quarterly horticulture alumni newsletter.                       | 1              | 2     | 3          | 4        | 5                 |
| 15. My student involvement in extracurricular activities (e.g., Hort Club) is helping me now.            | 1              | 2     | 3          | 4        | 5                 |

16. The courses titled 'Fall Greenhouse Crops' and 'Spring Greenhouse Crops' should not be combined into a 4 hour course. 1 2 3 4 5
17. I would have liked to participate in an undergraduate seminar course. 1 2 3 4 5
18. My advisor failed to show concern for me. 1 2 3 4 5
19. I consider undergraduate business courses to be very important for my career success. 1 2 3 4 5
20. I could have learned more if better physical facilities (e.g., landscape design studio) had been available. 1 2 3 4 5
21. I would have liked to learn more about opportunities in international horticulture. 1 2 3 4 5
22. The course 'Plant Protection' should be replaced by a similar course in the Pest Management Department. 1 2 3 4 5
23. I wish there had been more horticulture courses in my area of horticultural interest. 1 2 3 4 5
24. As an alumnus, I feel comfortable contacting the Department of Horticulture for help. 1 2 3 4 5
25. I feel that I was not provided with sufficient information concerning career opportunities in the field of horticulture. 1 2 3 4 5
26. The course 'Plant Environments' should be replaced by a plant physiology course taught by the Biological Sciences Department. 1 2 3 4 5
27. I feel that my horticulture courses placed too much emphasis on practical, applied learning. 1 2 3 4 5
28. My horticultural education at UMC has not given me an advantage in the job market over individuals lacking a college degree. 1 2 3 4 5
29. My educational experience in horticulture has enabled me to analyze and solve problems better. 1 2 3 4 5
30. I majored in horticulture because:
31. In your opinion, what are the positive features of our horticulture undergraduate program?
32. What suggestions do you have for improving our undergraduate program in horticulture?
33. How can the Department of Horticulture better serve you as an alumnus?
34. Additional comments:

Thank you for your help. This survey forms its own envelope. Please re-fold, staple or tape it closed and drop it into the mail. Postage is not necessary.

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