APPENDIX: TQM RESOURCES

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Nursery Industry Perceptions of Horticultural Needs for BeginningManagers

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Abstract

As the costs associated with higher education continue to increase in a period of shrinking state budgets, and public universities and colleges experience the paradigm shift from being state supported to state assisted, the need to involve the public sector in curricular reform efforts will escalate. This study explored the perceptions of nursery industry representatives regarding basic knowledge areas necessary for beginning managerial employees. The findings of the study revealed that the industry expects beginning managers to be knowledgeable of a variety of horticulturally-related areas. The most essential knowledge areas included plant knowledge (identification, cultural requirements, soil/fertilizer relationships, and pesticide formulation). In addition, the industry anticipates that beginning managers be knowledgeable of local, state, and federal regulations and laws. As a result of this study, the researchers recommended that prior to curricular modification, other stakeholders, including students and faculty be studied in order to determine if similarities in stakeholders' perceptions exist.

Introduction

As a result of a historic educational summit by the President and state governors held in Charlottesville, North Carolina in the Autumn of 1989, clear national performance goals were established (The Office of the President, 1990). These national educational goals were developed in an effort to make the U.S. more competitive in an international marketplace. This same report indicated that the initial step to improving the quality of higher education in the US involves the establishment of a public-private partnership. Certainly such a partnership is not possible without substantial industry input into curricular decisions.

In a report by the National Research Council (1992), H.O. Kunkel of Texas A&M University stated the following regarding industry and academia:

> Businesses are finding it increasingly difficult to employ, retain, and reward people to compete in a technology-driven world economy. Recruitment of students and continuing education are needed, and industry has a role and responsibility in both areas. Industry-academic linkages should be fostered and seen on campus. Colleges of Agriculture should give attention to the executive potential in students and graduates and should help them to obtain "combat" experience in business, such as through internships (p.5).

Prior to substantial curricular modifications in higher education, a divergent phase of data collection from stakeholders (students, industry, and faculty) is essential (Merritt & Hamm, 1994). Although higher education has been criticized for the absence of industry input in the decision making process (Long, Straquadine, & Campbell, 1992), such input is especially important in the horticultural sciences due to rapid advances being made in technology.

Determining what should be included in the higher education curriculum is extremely important in the nursery industry due to the immediate employment implications for students. Students enrolled in programs of higher education need reassurance that the skills and abilities they learn will be meaningful to their future employment goals. In addition, the nursery industry needs reassurance that what is taught in higher education is consistent with "real world" needs.

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Purpose and Objectives

The purpose of this study was to determine the essential knowledge areas for students entering the nursery industry. Specific objectives of the study were to:

(1) describe the background characteristics of nursery industry representatives; and

(2) determine the horticultural sciences knowledge areas essential for beginning managerial level employees (garden center managers; sales and marketing representatives; crew foremen; supervisors; department heads) entering the nursery industry.

Procedures

The target population for this descriptive study consisted of 862 members of the California Association of Nurserymen (CAN) based upon a population frame supplied to the researchers by CAN. The researchers carefully purged the list of duplicated names to control for selection error.

A random sample of 270 members was selected to participate in the study following procedures suggested by Krejcie and Morgan (1970). This sample size resulted in a margin of error of five percent. The members in the sample represented every geographical region of the state.

A mail questionnaire was developed with the procedures suggested by Dillman (1978). The instrument was initially reviewed by the CAN Education and Career Committee for content and face validity. It was then revised based upon the Committee's recommendations and field tested on a subsample of the population consisting of 40 CAN members not included in the sample of 270, for the purpose of establishing the reliability of the instrument. This resulted in a Cronbach's alpha reliability coefficient of $\underline{r} = .80$ or greater for each of the content areas included in the instrument.

The instrument (including a cover letter and a self-addressed stamped envelope) was mailed to the sample of 270 members for data collection in Fall, 1993. Approximately two weeks later, another copy of the instrument was mailed to nonrespondents. The two mailings resulted in a response rate of 42%.

For the purpose of controlling nonresponse error, a statistical comparison was made between responses received after the initial mailing and responses received after the final mailing. No statistically significant differences were found between the two groups. As a result (based upon a procedure forwarded by Miller and Smith, 1983), the researchers concluded with confidence that the data were representative of the entire sample of 270 members. The data were analyzed using the SPSS/PC+ statistical software program.

Findings

The respondents revealed that they had currently been employed in their present nursery-related organization for 18 years (sd = 12.19), with a range from one year to 60 years. They had been employed in the nursery industry for an average of 22 years (sd = 11.73). Typically they represented businesses that operated in one primary location (80.5%). In addition to being a CAN member, they also were members of an average of 2.5 professional organizations (sd = 3.73).

In terms of educational background, 25% of the respondents either had attended a community college or held a community college degree. In terms of their specific majors, most were either agricultural majors or business-oriented majors.

About two-thirds of the respondents either attended a baccalaureate granting institution or had graduated from one. Included in this group were the 15% who held a graduate degree. Their academic majors were diverse. College majors included agriculture (agricultural economics, animal production, environmental horticulture, forestry, landscape architecture, ornamental horticulture, viticulture, soils), business management, mathematics, history, sociology, psychology, and botany. None of the respondents had less than a high school degree.

Most of the respondents held a managerial level position in their respective organizations. The backgrounds included owners, presidents, sales managers, vice-presidents, buyers, and foremen. Four constructs were included in the questionnaire related to specific knowledge areas for beginning employees. Eight specific knowledge areas were included in the plant knowledge construct (Table 1). All of the skills were perceived as being of above average importance. The knowledge areas most highly valued (listed from most important to least important) were: (1) plant identification ($x = 3.45$, $sd = 0.66$); (2) cultural requirements ($x = 3.26$, $sd = 0.76$); (3) soil/fertilizer relationships ($x = 3.24$, $sd = 0.71$); and (4) integrated pest management ($x = 3.19$, $sd = 0.74$).

Five specific knowledge areas were included in the irrigation practices construct. The following knowledge areas were viewed as being of above average importance: (1) water conservation techniques ($x = 3.03$, $sd = 0.86$); (2) irrigation design ($x = 2.82$, $sd = 0.89$); and (3) drip irrigation ($x = 2.75$, $sd = 0.87$).

Only two knowledge areas were included in the construction and mechanics construct. Both were rated as being of above average importance. Landscape equipment operation and maintenance ($x = 2.63$, $sd = 1.03$) was rated slightly higher than general construction (structures and utilities) ($x = 2.61$, $sd = 0.96$).

Regulations and laws consisted of four specific

Table 1
Means, Standard Deviations, and Rankings for Horticultural Knowledge(n = 113)*

Item	Mean	SD	Rank
Plant Knowledge			
Plant identification	3.45	0.66	1
Cultural requirements	3.26	0.76	2
Soil/fertilizer relationships	3.24	0.71	3
Integrated pest management	3.19	0.74	4
Pesticide formulation	3.14	0.86	5
Tree pruning techniques	2.90	0.84	6
Drought tolerant plant materials	2.84	0.94	7
Plant propagation including tissue culture	2.82	0.97	8
Irrigation Practices			
Water conservation techniques	3.03	0.86	1
Irrigation design	2.82	0.89	2
Drip irrigation	2.75	0.87	3
Irrigation trouble-shooting	2.72	0.93	4
Irrigation install-ment	2.66	0.92	5
Construction & Mechanics			
Landscape equipment operation & maintenance	2.63	1.03	1
General construction (structures & utilities)	2.61	0.96	2
Regulations and Laws			
Labor laws	3.42	0.84	1
Pesticide regulations	3.41	0.80	2
Water conservation laws	3.08	0.91	3
Green waste management regulations	2.99	0.89	4

* Based upon a four point, Likert-type scale where = 1 not important, 2 = below average importance, 3 = above average importance, and 4 = extremely important.

knowledge areas. All of the knowledge areas were thought to be of above average importance. The most important knowledge areas were: (1) knowledge of labor laws (x = 3.42, sd = 0.84) and (2) knowledge of pesticide regulations (x = 3.41, sd = 0.80).

Conclusions and Recommendations

Because this study focused on a limited population, the researchers would caution against the generalization of these findings beyond CAN members. The respondents in this study appeared to be highly knowledgeable of the nursery industry based upon their experience in the industry. The respondents tended to represent business organizations in one geographic location, and were relatively active in professional organizations. In addition, the respondents could be described as being highly educated with a great deal of heterogeneity in terms of educational background. The respondents tended to represent management, which leaves one to ask if nonmanagerial employees would have responded in a similar manner?

All of the knowledge areas included in the study were viewed as being of above average importance. Clearly employers expect beginning managerial employees to be knowledgeable of plants as well as regulations and laws. Knowledge of irrigation practices and construction and mechanics were viewed as slightly less important. Additional studies should be conducted which focus on differing horticultural sciences knowledge areas which may not have been included in this study.

Although the essential knowledge areas identified in this study provide excellent baseline information which can be utilized in the curriculum development and review processes, some degree of caution should be used in an effort not to overgeneralize the findings. Readers need to keep in mind that the study results were averaged without regard to type of business or location. In determining knowledge areas to be included in the curriculum, it is essential that regional industry needs be considered, especially in a state as diverse as California. For instance, water conservation is probably of greater concern to Southern California nursery industry representatives, than to representatives in other areas of the state. The accuracy of these findings would certainly be enhanced if small focus groups of industry representatives were used in validating the findings.

Prior to curricular modification, the divergent phase of data collection should be continued involving students and faculty as well. After this information is collected, responses should be compared to provide a complete basis for curricular decisions.

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