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Abstract

The purpose of this study was to analyze the perceptions of employers of land-grant college graduates regarding their preparation for entry-level positions in the agricultural sector in relation to specific competencies. Overall it was found that land grant university graduates were prepared in the areas of interpersonal, communication, problem-solving, technology, decision-making, and management skills, in addition to technical competence. In order to ensure that Land-Grant college graduates reach higher levels of preparation in the aforementioned areas, it was recommended in general that curriculum revisions be made.

Introduction

The United States leads the world in agricultural productivity and research. According to Reinventing Agricultural Education for the Year 2020 the United States leading position in agriculture "lies in part because of its infrastructure for developing and delivery technology, including agricultural education programs in our public schools" (National FFA Organization, 2008). This network of scientist and educators has served the country well, but has begun to show a degree of wear, a great deal of this concerns the rapid pace of change that comes with technological innovation. Current curriculum development initiatives and educational delivery approaches in local school districts around the nation have not kept pace with the rate of technological change that the United States has experienced over the past decade. Rather than reacting to change as it comes, a passive approach, the agricultural education community must take a proactive stance and look ahead to develop a cohesive vision of its preferred future decade. The National Research Council (1988) in the book *Understanding Agriculture* emphasized that in order for agricultural education to remain viable educators should emulate the best current programs while generating new ways to deliver agricultural education.

The future of the agricultural sector will be characterized by keywords as turbulence, globalization, and networking, innovation, coping with uncertainties and risks and entrepreneurship. Agricultural colleges have to develop more vigorous curriculum in order to prepare today's college student for the competitive global agricultural workforce (American Farm Bureau, 2003). Competition with other technical colleges for non-agricultural occupations will increasingly be a way of life. Historical roots in agricultural production will no longer provide land-grant colleges with adequate student enrollments. Land-grant colleges must become more responsive to the need of the global job market. Autonomous, innovative colleges should form the core of the future agricultural land-grant system, a system which can provide leadership for the global food and fiber system (American Farm Bureau, 2008).

The agricultural industry is the nation's largest employer, accounting for more than 22 million individuals employed in various phases such as food and fiber production, agriscience research, environmental conservation, and agricultural retail (American Farm Bureau, 2008). The dual challenges of competing in a world market and rapid technological advancements have necessitated a redesign of the workplace into an innovative work environment known as the high-performance workplace. This environment requires a behavior and orientation toward work that go beyond systematic task performance. It expects workers at all levels to solve problems, create ways to improve the methods they use, and engage effectively with their coworkers (Bailey, 1997; Packer, 1998). Employers recognize workers who demonstrate this highly skilled, adaptive blend of technical and human relations ability as their primary competitive edge. Job-specific technical skills in a given field are no longer sufficient as employers scramble to fill an increasing number of interdependent jobs (Askov & Gordon, 1999; Murnane & Levy, 1996). Many American and international labor economists point out the importance of continuously developing skills beyond those required for a specific job, and they identify employability skills that enable individuals to prove their value to an organization as the key to job survival.

Employability skills are transferable core skill groups that represent essential functional and enabling knowledge, skills, and attitudes required by the 21st century workplace (SCANS, 1991). They are necessary for career success at all levels of employment and for all levels of education. Adequate employability skills are needed by practically all workers in the agricultural field. If land-grant colleges strived to prepare its graduates for entry-level positions in the global

workforce then this action would lead to a stronger economy. According to Goecker, Gilmore, Smith, and Smith (2005) vast opportunities exist within the agricultural industry in the areas of agricultural and forestry production, education, communication, and government services, scientific and engineering, and management and business. In order for land-grant college graduates to compete for positions in today's highly competitive workforce, they must equip themselves with the requisite knowledge, skills and dispositions needed for the world of work (Lankard, 1995).

Conceptual Framework

The Department of Labor conducted a study, in May of 1990 to gauge how well schools prepared young people for the work force. The SCANS Report outlined and examined the demands of the nation's workplace and concluded that more than half of American youth matriculated from high-school without the knowledge or foundation required finding and holding a good job. Due to the SCANS report major changes were made in education as educational officials faced the reality that students were not receiving what they needed in order to be prepared for and successful in the global workforce of the 21st century (SCANS Report, 2006).

A major goal of the report was to present the necessary functional and enabling skills that society must offer to every child by age 16 (SCANS, 1991). The SCANS staff conducted studies of cognitive science research literature related to the importance of learning in context, met with cognitive scientists, and subsequently advocated the teaching of skills within the functional context of the workplace. This represented what the commission termed the most radical change in educational content since the 20th century. The SCANS report consisted of a three-part foundation component and five workplace competencies. The three foundation skills were Basic Skills, Thinking Skills, and Personal Qualities. Additionally, the report provided five competencies that effective workers must possess: Resources, Interpersonal Skills, Information, Systems, and Technology.

Arnold Packer, former executive director of SCANS, identified three misconceptions about SCANS: (1) the assumption that SCANS relates primarily to entry-level employment when the competencies are needed at all rungs of the career ladder and all levels of education, (2) the assumption that SCANS refers only to "soft skills" such as team work and interpersonal skills when they are only one of the five broad competency groups including using technology skills or interpreting information skills, and (3) the most controversial misconception that SCANS appears to conflict with rigorous academic work when the skills are needed at the Ph.D. Level of the education continuum (Packer, 1998). The aforementioned report will serve as the conceptual framework of this study.

Purpose and Objective

The purpose of this study was to analyze the perceptions of employers of land-grant college graduates regarding knowledge, skills, and dispositions needed for entry-level positions in the agricultural sector. The objective was to describe the level of preparation possessed by graduates of land-grant colleges in relation to knowledge, skills and dispositions needed for entry-level positions.

Methodology

The sample for this study consisted of 57 exhibitors representing 37 different government and corporate organizations at an agricultural career expo at an 1890 land grant university. This list was obtained from the career expo program. For this study, a survey was adapted from a

study conducted by Graham (2001). The validity of Graham's instrument was established by means of content and face validity. Brown (1983) defined content validity as "the degree to which items on a test representatively sample the underlying content domain" (p. 487). Brown recommended using expert judges as one means of establishing content validity. Face validity was established with the aid of a panel of experts.

The survey instrument for this study consisted of four sections. Section one was designed to gauge the opinion of employers regarding the level of preparation of land- grant college graduates in relation to their interpersonal skills, communication skills, computer skills, character skills, and technical competency. Section two of the study was designed to gauge the opinion of employers regarding the level of importance of basic work-place knowledge, skills, and abilities for entry-level jobs. Section three was designed to rate the importance of various life experiences in relation to land grant college graduate's potential career success. Section four was designed to rate the future growth areas that employers feel will impact or change agriculture for the next 5-10 years. This research article will focus upon section one of the study.

For this study a mixed-mode method of data collecting was employed combining traditional mailings with email surveying (Dillman, 2002). In recent years, there has been a trend toward using multiple methods to collect data because some individuals respond more quickly to one survey method versus another. Other reasons for using a mixed mode method of surveying include concerns in trying to reduce nonresponse error and cost. Additionally, issues of coverage error are of great concern when using more traditional unimodal methods. Some individuals in today's society may be contacted easier by mail, others by telephone, personnel visits, and lastly by email/Internet mode (Dillman, 2002).

In order to test reliability, a post hoc reliability was taken at the conclusion of data collection on each section of the survey instrument. Reliability assures the dependability or precision of an instrument. Chronbach's alpha was used as the reliability measure for this study. The benefit of the alpha is that the computer print out gives one a clue as to which item is not contributing to the measure. Nunnally (1967) suggested that 0.5 to 0.6 would be high enough in the early stages of research. The 0.8 measure is commonly used. Measurements of 0.9 might not be high enough where precision is needed. Chronbach's alpha reliability coefficients for the survey were as follow: Section One = 0.94, Section Two = 0.92, Section Three = 0.85, and Section Four = 0.91.

An initial letter informing the exhibitors of the survey was sent by traditional mail. The letter contained instructions on how to answer the survey, which was conducted by email. Respondents were asked to verify their correct email address if different from the one stated in the letter by sending the correct one electronically to the researchers. Those who preferred a traditional mail survey were allowed the option. No participates indicated that they would prefer a traditional mail survey; therefore all surveys were done electronically. Exactly one week after the initial mailing the full survey was sent to each subject by email with instructions. By the end of one week, 15 surveys had been received. After week one had passed a reminder email was sent and by the end of week two, five more responses had been received. The researchers mailed a full survey packet to all non-respondents through traditional mail week three and by the end of week three the survey yielded four more responses. Finally follow-up phone calls were made to all non-respondents in order to yield a maximum return rate. Twenty-four surveys were received for a final return rate of 42%. In order to control for non-response error, Miller and Smith (1983) recommended comparing early to late respondents. Research has shown that late respondents are

often similar to non-respondents, no significant differences were found in this study on these questions.

Findings

In Table 1, respondents felt that Land-Grant universities had prepared graduates in the following areas: decision-making, problem-solving, management skills, organizational skills, leadership, etiquette, and global awareness. Additionally, employers felt that land grant college graduates had good preparation in the following interpersonal skills: initiative, creativity, teamwork, dedication, appearance, and being open-minded.

Table 1
Interpersonal Skills

	Mean	SD
1 Teamwork	3.75	0.94
2. Open-Minded	3.75	0.74
3. Appearance	3.67	0.96
4. Creativity	3.67	1.13
5. Dedication	3.58	00.65
6. Initiative	3.50	0.98
7. Leadership	3.42	1.06
8. Global Awareness	3.42	1.41
9. Etiquette	3.33	0.96
10 Problem Solving	3.17	0.70
11 Decision Making	2.83	0.92
12 Organizational Skills	2.83	1.31
13. Management Skills	2.75	1.03

Scale: 1 = Unprepared, 2 = Somewhat Prepared, 3 = Prepared, 4 = Good Preparation
5 = Thoroughly Prepared

In Table 2, respondents felt that land-grant universities had prepared college graduates in the following areas: Understanding Instruction, Telephone, Listening, Technical Writing, Creative Writing, Presentation Skills, and also Second Language. Employers also felt that land-grant university graduates had good preparation in verbalizing skills.

Table 2
Communication Skills

	Mean	SD
1. Verbalizing	3.58	0.88
2. Telephone	3.42	0.65
3. Understanding Instruction	3.33	1.20
4. Listening	3.25	1.19
5. Technical Writing	3.17	1.24
6. Presentation Skills	3.17	1.49
7. Creative Writing	2.92	1.21
8. Second Language	2.50	0.88

Scale: 1 = Unprepared, 2 = Somewhat Prepared, 3 = Prepared, 4 = Good Preparation
5 = Thoroughly Prepared

According to Table 3, respondents felt that graduates were prepared in relation to accounting systems. Additionally, they perceived graduates as having good preparation in relation to the following computer skills: word processing, spreadsheets, database, CAD, presentation graphics, and internet access & use.

Table 3
Computer Skills

	Mean	SD
1. Internet access and use	4.75	0.74
2. Word Processing	4.25	0.94
3. Spreadsheets	4.08	0.97
4. Database	3.75	0.94
5. Presentation Graphics	3.67	1.20
6. CAD	3.50	1.22
7. Accounting Systems	3.00	0.83

Scale: 1 = Unprepared, 2 = Somewhat Prepared, 3 = Prepared, 4 = Good Preparation
5 = Thoroughly Prepared

In Table 4, respondents stated that land-grant university students had good preparation in the following character skills: honesty, dependability, and integrity.

Table 4
Character Skills

	Mean	SD
1. Dependability	3.75	0.61
2. Integrity	3.58	0.65
3. Honesty	3.50	0.66

Scale: 1 = Unprepared, 2 = Somewhat Prepared, 3 = Prepared, 4 = Good Preparation
5 = Thoroughly Prepared

In Table 5, respondents felt that graduates were perceived to have good preparation in the following technical competency skills: physical science, biological science, humanities, mathematics, and agricultural sciences.

Table 5
Technical Competency

	Mean	SD
1. Agricultural Sciences	4.25	0.74
2. Mathematics	3.92	0.88
3. Biological Sciences	3.58	1.06
4. Physical Sciences	3.50	1.06
5. Humanities	3.50	0.66
6. Social Sciences	3.42	0.78

Scale: 1 = Unprepared, 2 = Somewhat Prepared, 3 = Prepared, 4 = Good Preparation
5 = Thoroughly Prepared

Conclusions

In this study it was found that land-grant university graduates are prepared relative to interpersonal skills. It was perceived that land-grant university graduates had been prepared in reference to decision-making skills. Respondents believed land-grant university graduates are prepared in relation to problem-solving skills. According to the SCANS report (1991), interpersonal skills, decision-making skills, and problem-solving skills are essential in the workplace. Interpersonal skills are needed so that individuals can work on teams, teach others, serve customers, lead, negotiate, and work well with people from culturally diverse backgrounds. Decision making-skills are needed in the workforce to solve problems by selecting one course of action from several possible alternatives. Problem-solving is an essential skill, in that it helps one recognize that a problem exists, to identify possible reasons for the discrepancy, and devise and implement a plan of action to resolve it.

Respondents believed that graduates are prepared in management skills. According to respondents graduates have organizational skills when entering the workforce. Moreover, employees' felt that land-grant university graduates are prepared in leadership skills. Employers also believed that graduates are prepared in global awareness skills. According to the SCANS report (1991), workers in today's global workforce must possess all of the aforementioned skills in order to effectively contribute to their workplace environment.

According to respondents, graduates are prepared when entering the workforce in communication skills. This statement also ties with the SCANS report (1991), which stated competent workers in the high performance workplace must be able to effectively communicate information through a variety of channels to serve clientele and maintain productivity. Communication skills are important when entering the workforce because without adequate communication skills, one cannot be a productive professional.

In relation to computer skills, employers felt that graduates were prepared in accounting systems. Additionally, they perceived graduates as having good preparation of the following computer skills: word processing, spreadsheets, database, CAD, presentation graphics, and Internet access & use. According to the SCANS report (1991), competent workers in the high-performance workplace need to use information so they can acquire and evaluate data, organize and maintain files, interpret and communicate, and use computers to process information.

Based on technical competency, respondents felt that land grant university graduates were prepared in social science as a technical competence. Graduates were perceived to have good preparation in the following technical competency skills: physical science, biological science, humanities, mathematics, and agricultural sciences. Based upon the SCANS report (1991), competent workers in the high-performance workplace must have adequate knowledge in technical areas of study such as mathematics, science, and technology. Educational psychologists have shown that high-achieving students know what needs to be learned and how to learn it. While making those kinds of self-assessments may sound simple and something most college students could do, many psychology professors find that these students are not self-aware enough to conduct them.

Recommendations

Based upon the aforementioned conclusions, the following recommendations were made:

1. Land-grant colleges are highly encouraged to analyze their existing curricula in order to better prepare graduates in the areas of interpersonal skills, decision making skills, and problem solving skills. Even though it was indicated graduates are prepared, higher preparation levels should be a goal. A course in leadership would aid in the development of these skills.
2. Land-grant colleges' administrations are advised to incorporate a course in business or professional communication into their existing curricula, which would provide even more specialized training.
3. It is recommended that land-grant colleges and universities ensure that students complete a course in information technology, specifically concerning word processing, spreadsheets, database, CAD, presentation graphics, and Internet access & use.
4. Lastly, it is also recommended that more technical content be incorporated into the curricula of land-grant colleges and universities in order to improve the overall knowledge base of students. Even though it was indicated that graduates were prepared in this area, more technical preparation is always a plus.

Implications

Land-grant colleges and universities have a major responsibility to prepare their students with the knowledge, skills, and dispositions to compete in the highly competitive global workforce of today. Given this charge, every effort should be made to have in place curricula that ensure this mandate.

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