The Effects of an Agricultural Communications Workshop on Self-Efficacy and Career Interest: A Comparison between Agriculture and Non-Agriculture Students

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Abstract

The purpose of this study was to assess the effects of a one-week workshop on urban agriculture and non-agriculture students' self-efficacy and career interest related to agricultural communications. Non-agriculture students experienced increases in self-efficacy for agricultural communications tasks, self-efficacy toward overcoming obstacles for pursuing a degree in agricultural communications and interest in agricultural communications careers. Agriculture students decreased in all three constructs. The differences in the changes between agriculture students and non-agriculture students were statistically significant for both self-efficacy constructs but not for career interest. Based on the results, similar programs should focus efforts on non-agriculture students to expand the recruitment base for colleges of agriculture. Efforts should continue to increase urban agriculture programs to provide more long-term exposure to career opportunities in agriculture and natural resources.

Introduction

Recruiting

Higher education degrees in agriculture are not keeping pace with growth in degrees overall. When considering the number of associate's and bachelor's degrees awarded in agriculture and natural resources, the number declined slightly from 29,949 for 1997-1998 to 29,851 (-0.003%) for 2007-2008, while there was an growth of 570,272 (32.7%) in associate's and bachelor's degrees awarded overall (U.S. Department of Education, 2010). This decline is expected to continue according to estimates. The number of graduates of colleges of agriculture is expected to decline from an estimated 32,325 annually between 2005 and 2010 (Goecker et al., 2005) to an estimated 29,300 annually between 2010 and 2015 (Goecker et al., 2010). The needs of the agriculture and natural resources industry is increasingly being met by graduates without agriculture and natural resources degrees (Goecker et al., 2005; Goecker et al., 2010).

This lack of growth indicates a need for better recruiting practices. Urban populations are receiv-

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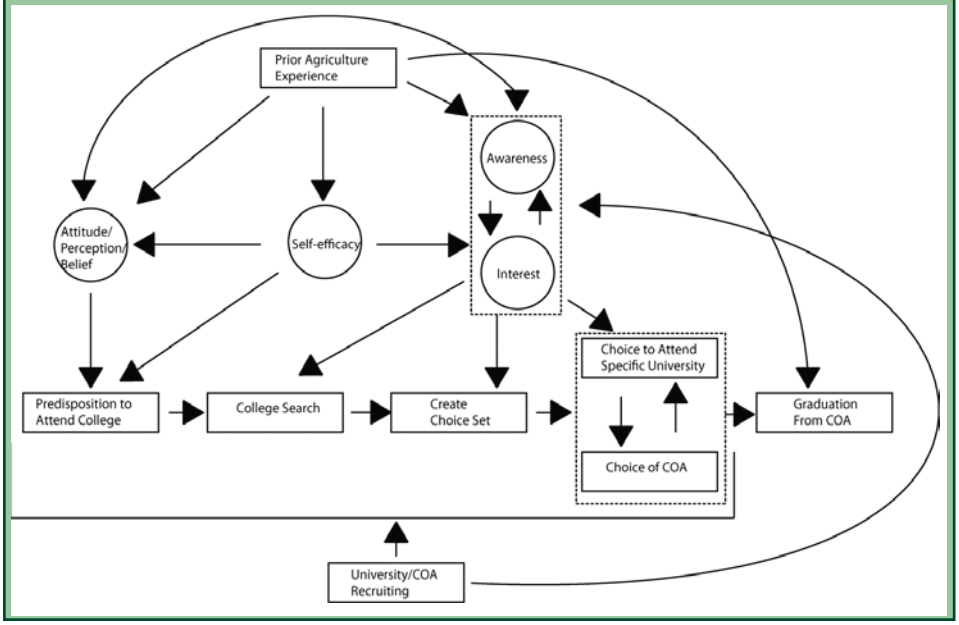
ing much of the attention for improving recruiting practices in part because the United States is becoming increasingly urbanized (Department of Economics and Social Affairs Population Division, 2002). Promoting agriculture as a whole is not enough. Research indicates that recruiting practices are more effective when specific interests are targeted, such as agricultural communications. Lingenfelter and Beierlein (2006) found that interest in one area of agriculture is unrelated to interest in other areas of agriculture (i.e., interest in plant sciences would not be related to animal sciences). In addition to recruiting for specific career interests, it is also necessary to make individuals aware of their post-secondary choices. Students who are unaware of academic programs, which could be a good fit for them, may eliminate them from their options for higher education (Hossler and Gallagher, 1987).

Figure 1. College-decision web for the student college-decision process by Settle et al. (2008).



Conceptual Framework

The college-decision web by Settle et al. (2008) that describes how students choose universities and majors serves as the conceptual framework for the study (Figure 1). That framework is based on two models: Hossler and Gallagher's (1987) three-phase model of student college choice and Chapman's model of student college choice (1981). Chapman's (1981) model explored how student characteristics and external influences affected the college-decision process. In Chapman's model, student characteristics were deemed more important in the college's choice of the student, not the student's choice of the college. An example would be student ability level. The factors affecting student choice were the external influences: significant persons (e.g., parents and teachers), fixed college characteristics (e.g., location) and university communication with students (e.g., campus visits and recruitment materials). Hossler and Gallagher's (1987) model broke the college-decision process into three steps: predisposition to attend college, the search process where the student and the college are actively seeking out information about each other and when the student evaluates their choices and picks a university. Combining the two frameworks, Settle et al. (2008) sought to explain the factors involved in choosing a college and major, as well as when those factors affected the decision process. Information from relevant literature was also used to complete the model. The factors in the model were prior agriculture experience, attitude/perceptions/belief, self-efficacy, interest, awareness and university recruiting practices. The process consisted of predisposition to attend college, the college search, creation of college choice set, choice of university and/or college and graduation from college. This study addressed self-efficacy and interest, including how experience affected interest and self-efficacy in the Settle et al. (2008) model.

Self-Efficacy and Career Interest

Self-efficacy is an individual's belief in their ability to accomplish a task. Self-efficacy affects behavior *"by its impact on… goals and aspirations, outcome expectations, affective proclivities and perception of impediments and opportunities in the social environment"* (Bandura, 2006, p. 309). As for interest, Lynch (2001) found that personal decision was the most influential factor affecting students' decision to enroll in college agriculture programs. Swanson and Fouad (1999) stated that individuals who are helping students make the transition from school to work *"need to help students develop a sense of their own skills, interests and values as they make vocational choices"* (p. 341), illustrating the importance of self-efficacy and career interest.

Delving further into self-efficacy, though Bandura (2006) stated that *"the efficacy belief system is not a global trait but a differentiated set of self-beliefs linked to distinct realms of functioning"* (p. 307), he later stated *"behavior is better predicted by people's*

beliefs in their capabilities to do whatever is needed to succeed than by their beliefs in only one aspect of self-efficacy relevant to the domain" (p. 310). Although self-efficacy as a whole consists of these individual self-efficacies toward specific tasks, its ability to predict behavior is best understood by understanding overall self-efficacy for the individual. Self-efficacy can be further broken down to three dimensions: magnitude, strength and generalizability (Compeau and Higgins, 1995). Magnitude is the level of task difficulty the person believes they can accomplish, strength is the difficulty to change a person's self-efficacy and generalizability is the range of self-efficacy relation to a specific task to a wider scope of tasks.

For career interest, one recurring topic is the notion that students need to be made aware of the variety of careers that are available. Krumboltz and Worthington (1999) suggested that rather than having students rely on their current interests and capabilities, students should expand their career interests and capabilities. Students *"need to be asked 'What are you curious about?' They need to practice exploring their own curiosity"* (Krumboltz and Worthington, 1999, p. 318). Specific to agriculture, Boumtje and Haase-Wittler (2007) stated that agriculture needs to be promoted in terms of the variety of careers available so students are making career decisions "based upon their interest and not those of others" (p. 352). Savickas (1999) reported that students who are aware of the choices and necessary planning when searching for a career transitioned better into a career than those who are not aware.

Understanding self-efficacy and interest in a vacuum will not suffice. The constructs are related. As self-efficacy relates to career interest, Degenhart et al. (2006) found that improvement in self-efficacy toward careers improved students' interests in the careers, and, conversely, decreases in self-efficacy toward the careers led to decreased interest in the careers. Similarly, Esters and Knobloch (2007) found that *"self-efficacy and outcome expectations were strong predictors of interest and intentions to pursue careers in agriculture"* (p. 729) for students of a rural Korean agricultural magnet school. Interest can affect ability because individuals will self-select experiences based on interests (Roberts et al., 2003; Schooler, 2001), which could limit self-efficacy growth in those areas. The effects of self-selection become more stable in adulthood because adults have more control over what environment they are in than children and teenagers do (Ickes et al., 1997; Scarr, 1996).

Experience

Experience is an area that the Hossler and Gallagher (1987) and Chapman (1981) models do not readily account for but is shown to affect college and career decisions in other studies. The experiences relevant to this study are structured educational experience in agriculture, be it school-based agricultural education, 4-H, or other educational programs related to agriculture.

Enrollment in secondary agriculture programs has been linked to enrollment in post-secondary agriculture programs. Boumtje and Haase-Wittler (2007) found that the highest barrier for not enrolling in agriculture majors was not enrolling in high school agriculture classes. Similarly, Wildman and Torres (2001) found that taking agriculture courses and participating in other agriculture activities, such as 4-H and FFA, were two of the most influential experiences on the decision to pursue a major in agriculture. These experiences not only relate to the initial post-secondary enrollment decision but also to the decision to complete an agricultural degree. Dyer et al. (1996) reported only 52.9% of those who did not participate in high school agriculture planned to graduate from the college of agriculture, while 94.9% of those who had participated in high school agriculture programs planned to graduate from the college of agriculture.

While high school agriculture programs can be an effective way of introducing students to agriculture, other means of recruiting secondary students need to be explored. Russell (1993) recommended that colleges of agriculture take a more active role in this process of introducing students to opportunities in agriculture. Wiley et al. (1997) assessed results of participating in a pre-college workshop relating to food and agricultural sciences. Participants of the program experienced positive attitudinal gains in relation to agriculture. These gains remained one year after the program, indicating the possible endurance of such intervention activities.

Purpose and Objectives

The Big City Big Country Road Show was designed to explore the potential of a workshop on recruiting urban students into colleges of agriculture as a joint effort between Texas Tech University, Texas A&M University and Howard College, funded by the USDA Higher Education Challenge Grant program. The purpose of this study was to determine if there were any differences between effects from a workshop for high school students from an agriculture program and students recruited from high schools without agriculture programs. More specifically, the objectives of this study were to

1. Compare agriculture and non-agriculture students' levels of self-efficacy and interest for pursuing agriculture careers before and after the workshop.

2. Compare changes in self-efficacy and career interest for agriculture and non-agriculture students.

Methods

A five-day workshop was designed to provide an overview of agriculture and agricultural communications. The workshop was divided into classroom and experiential learning sessions that provided content in risk and crisis communications, news writing, videography, web design and photography. The same instructors were used for each lesson when possible, but the risk and crisis communications lesson was taught by different instructors for two of the workshops. The experiential learning opportunities provided exposure to real-world applications of the classroom lesson content. These opportunities included students applying lesson content to create videos, pictures and websites.

The workshops were conducted in four U.S. cities in the summer of 2008. In two of the cities, high schools without agriculture programs were chosen. In these schools, science teachers assisted in recruiting their students to participate in the workshop. These teachers were asked to identify students who had an interest in communications. In the agriculture schools, teachers were asked to identify students in the agriculture program who had an interest in communications.

The population for this study included workshop participants in El Paso (Non-agriculture), Atlanta (Non-agriculture), Chicago (Agriculture) and San Antonio (Agriculture). El Paso had seven participants, Atlanta had six participants, Chicago had 11 participants and San Antonio had nine participants. The demographic data of the participants in each of the four workshops is summarized in Table 1.

Table 1. Gender, Ethnicity and High School Grade Level of Agricultural Communications Workshop Participants.

	El Paso (n = 7)	Atlanta (n = 6)	Chicago (n = 11)	San Antonio (n = 9)
Gender				
Male	1	2	2	3
Female	6	4	9	6
Ethnicity				
White, non-Hispanic	0	0	3	0
Black, non-Hispanic	0	3	6	0
Hispanic	7	2	2	9
Native American	0	1	0	0
Grade level				
Freshman	0	0	0	1
Sophomore	5	1	5	3
Junior	2	4	6	5
Senior	0	1	0	0

The research used pre- and post-workshop questionnaires to gather data from the workshop participants regarding self-efficacy and interest toward agricultural communications careers. Research participants answered the pre-workshop questionnaire in each respective city prior to beginning the workshop lessons. The second questionnaire was given on the final day of the workshop after all of the lessons had occurred. The participants were assigned codes to log into the online questionnaires to allow responses before and after the workshop to be tracked.

The instrument for the study was adapted from the questionnaire used by Compeau and Higgins (1995) to assess computer self-efficacy and modified using Bandura's (2006) suggestions for constructing self-efficacy scales. Self-efficacy and interest were measured using 11-point Likert-type scales. For self-efficacy, the scale ranged from 0 = Cannot do it at all to 10 = Highly certain that I can do it. There were two self-efficacy sections for both the pre- and post-workshop questionnaires: one section assessed self-efficacy toward specific agricultural communications-related tasks (e.g., constructing a website) and the other section assessed self-efficacy in overcoming potential obstacles in pursuing a degree in agricultural communications (e.g., required basic knowledge of agriculture). The career interest section of the instrument measured interest toward a career in agricultural communications using a Likert-type scale that ranged from 0 = very strongly disagree to 10 = very strongly agree. A grand mean was calculated for each of the three constructs for every participant. Changes in both self-efficacy constructs and career interest were calculated using the grand means and the changes of the agriculture and non-agriculture students were compared using t-tests.

Reliability was assessed post hoc for the questionnaires by calculating Cronbach's alpha for each section of the questionnaires. The reliability scores for the pre-workshop questionnaire were 0.89 for self-efficacy toward specific tasks, 0.86 for self-efficacy toward overcoming degree-related obstacles, and 0.88 for career interests. The reliability scores for the post-workshop questionnaire were 0.86 for self-efficacy toward specific tasks, 0.84 for self-efficacy toward overcoming degree-related obstacles, and 0.83 for career interests. A reliability score of .80 is generally considered proficient (Norcini, 1999). The instrument was reviewed by faculty of the University of Florida for content and face validity.

The study was approved by Texas Tech University's institutional review board. All workshop participants were eligible to be subjects, but they were required to

have a parental consent form signed to participate in the research as well as signing an assent form themselves. Research participation was not required to participate in the workshop. There were no incentives provided to the subjects for participating in the research.

Results and Discussion

For changes in self-efficacy toward specific tasks, there were differences in responses between agriculture and non-agriculture students (Table 2). Agriculture students' self-efficacy toward tasks decreased (-0.94), while non-agriculture students' self-efficacy toward tasks increased (0.88). The difference between the changes in task self-efficacy was statistically significant ($t = 2.70$, $df = 24$, $p = .01$). Similar results also occurred for self-efficacy toward obstacles for completing a degree in agricultural communications (Table 3). Agriculture students decreased (-0.44) and non-agriculture students increased (0.60). The difference between the changes was also statistically significant ($t = 2.30$, $df = 31$, $p = .03$). For career interest (Table 4), agriculture students decreased slightly (-0.06), while non-agriculture students experienced an increase (1.01), but the difference between the changes in means was not statistically significant ($t = 1.81$, $df = 26$, $p = .08$).

Self-efficacy and interest are interrelated constructs that are important for career choice (Boumtje and Haase-Wittler, 2007; Degenhart et al., 2006; Esters and Knobloch, 2007; Krumboltz and Worthington, 1999; Lynch, 2001; Swansou and Fouad, 1999). The results for non-agriculture students were in line with the findings of Wiley et al. (1997), but agriculture students were not. The results indicate that prior experience affected the program's ability to affect self-efficacy and career interest (Settle et al., 2008). Because agriculture students decreased on all three constructs and non-agriculture students increased on all three, these results indicate similar programs would have more success if they focused on non-agriculture students.

Another aspect of the results is the participants were exposed to different career options. With past work showing that students may have limited career interests based on awareness (Boumtje and Hasse-Wittler, 2007; Hossler and Gallagher, 1987; Krumboltz and Worthington, 1999), the increase in interest, particularly for non-agriculture students, indicates the possibility for workshops to expand students' career interests by exposing them to different career options.

Summary

Differences were found between effects from the workshop on agriculture students and non-agriculture students for self-efficacy and career interest toward agricultural communications. The results indicated that the workshop had positive effects on non-agriculture students for self-efficacy and career interest, but the results were not the same for agriculture students. Future programs of this nature should focus on students without agriculture backgrounds to optimize the effectiveness of the programs. Research should also be conducted to assess the long-term results of this program and similar programs in the future. Specifically, participants' post-secondary enrollment decisions and degree completion should be addressed. The research should also address long-term changes in attitudinal constructs similar to the Wiley et al. (1997) study.

The development of urban secondary agriculture programs should continue. Despite the results of this study, secondary agriculture programs and 4-H have already been documented and recommended as valuable sources of students for colleges of agriculture (Boumtje and Haase-Wittler, 2007; Dyer et al., 1996; Russell, 1993; Wildman and Torres, 2001). Urban agriculture programs have the ability to provide more experiences over a longer period of time that are more likely to be retained by students compared to short-term interventions, such as the workshop in

Table 2. Difference in changes in levels of self-efficacy toward agricultural communications tasks between agriculture and non-agriculture participants.

	Agriculture	Non-agriculture	t value
Pre-workshop self-efficacy toward tasks	7.85	7.47	
Post-workshop self-efficacy toward tasks	6.91	8.35	
Change	-0.94	0.88	2.70*

[z]Self-efficacy was coded on a scale ranging from 0 = Cannot do it at all to 10 = Highly certain that I can do it.
*p<.05.

Table 3. Changes in levels of self-efficacy toward overcoming obstacles for pursuing a degree in agricultural communications between agriculture and non-agriculture participants.

	Agriculture	Non-agriculture	t value
Pre-workshop self-efficacy toward obstacles	7.24	7.93	
Post-workshop self-efficacy toward obstacles	6.80	8.53	
Change	-0.44	0.60	2.30*

[z]Self-efficacy was coded on a scale ranging from 0 = Cannot do it at all to 10 = Highly certain that I can do it.
*p<.05.

Table 4. Changes in levels of interest for a career in agricultural communications between agriculture and non-agriculture participants.

	Agriculture	Non-agriculture	t value
Pre-workshop career interest	6.90	6.87	
Post-workshop career interest	6.84	7.88	
Change	-0.06	1.01	1.81

[z]Career interest was coded on a scale ranging from 0 = very strongly disagree to 10 = very strongly agree.

this study. But until more of these permanent programs can be established, similar short-term interventions should continue to be developed and improved based on prior results to reach students who do not have access to permanent agricultural education programs.

There is not an easy solution and it will likely take multiple approaches to reach the ultimate goal of meeting the graduate needs of the agriculture and natural resources industry. Colleges of agriculture should continue to support short-term interventions, such as the one addressed in this study and urban agriculture programs to increase the number of urban students who pursue careers in agriculture to meet the agriculture and natural resources industry's employment needs (Goecker et al., 2010; U.S. Department of Education, 2010).

There are limitations due to the scope of the study. First, the results may only apply to this program. Second, because participants were not randomly selected, results may not apply beyond this sample to the students' schools and cities.

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