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Influence of Selected Personal Characteristics on Florida Master Gardener's Instructional Efficacy

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With increased budget cuts and a shortage of funding sources, Cooperative Extension must have a reliable group of proficient volunteers to carry–out organizational goals. Developing an understanding of volunteer abilities will assist extension agents in preparing and utilizing volunteers. Self–efficacy theory provided the theoretical framework of this study. The purpose of this study was to develop an understanding of the teaching self–efficacy of Florida Master Gardeners. The questionnaire included the instructional efficacy construct from the Teacher Sense of Efficacy Scale (TSES) and questions about participant demographics. The sampled population was 613 adult Master Gardeners with a total response rate of 86%. The majority of participants were women, white, earned some type of higher education degree, and 56 years old or older. Participants felt at least "some influence" in their effective teaching responsibility as a volunteer educator. Education was the sole demographic characteristic that had a significant effect on instructional efficacy. Proficiently training and retaining adults as volunteer educators in the Master Gardener program extends the reach of Cooperative Extension throughout Florida's communities.

Keywords: instructional efficacy, Master Gardeners, volunteer educators, extension education

Introduction

Research is needed on Master Gardeners' (MGs) instructional efficacy due to the valuable resource these adults provide Cooperative Extension as volunteer educators. MGs are volunteer educators serving as practitioners in teaching homeowners recommended horticultural practices and subject matter provided by the land–grant university's research branch. In Florida, there are approximately 3,822 active adult MGs that serve 58 of the state's 67 counties. MGs complete a thirteen week course on topics such as plant diseases, soil fertility, and entomology. Adults are required to donate 75 volunteer hours annually to remain certified as a Florida MG once their education is finished.

MGs' responsibilities are to teach horticultural demonstrations to homeowners in communities and provide consultations to clientele via face–to–face interaction and the telephone at the local extension office. Florida MGs taught horticultural information to approximately 64,000 adults in 2009 (E. Eubanks, personal communication, June 9, 2010). Cooperative Extension should use trained MGs in countless volunteer opportunities in order to obtain a good return on their investment (Meyer, 1997; Swackhamer & Kiernan, 2005).

Florida MGs are required to teach local constituents recommended horticultural practices. The duties of the Cooperative Extension volunteer have become increasingly more significant in order for the organization to provide reliable services to clientele as Extension programs have continued to face budget deficits and decreased funding (Steele, 1994). The former Director of Florida Extension said the total value of Florida Master Gardener (MG) volunteer hours in 2007 was worth

approximately $8,000,000 (L. Arrington, personal communication, June 1, 2008). In 2009, 217 adults terminated their MG participation in Florida. The economic value lost to Florida Extension due to the discontinued MG volunteer service was worth approximately $285,000 (E, Eubanks, personal communication, July 18, 2010). Due to budget constraints, it is critically important to retain high quality volunteer educators in MG.

Adults need to be appropriately prepared in order to serve as effective volunteer educators in MG. National statistics indicated, on the average, one out of three volunteers cease volunteering after one year of service (Corporation for National and Community Service, 2006). The Corporation for National and Community Service suggested preparing volunteers correctly may encourage individuals to continue their volunteer service.

Previous research has identified MGs as typically older white women (Rohs, Stribilng, & Westerfield, 2002; Rouse & Clawson, 1992; Ruppert, Bradshaw, & Stewart, 1997; Waliczek, Zajicek & Lineberger, 2005). However, little research exists as to MGs' level of education, income, or length of tenure in the program or how those characteristics affect their teaching efficacy. MGs are volunteer practitioners for Cooperative Extension. The National Research Agenda called for research to "identify the competencies needed by agricultural extension practitioners" (Osborne, 2007, p. 14). Research is needed to develop an understanding of Florida MGs teaching efficacy given the economic value that MGs provide Extension as a volunteer teaching force of practitioners and the large numbers of clientele contacts MGs serve (Strong & Harder, 2010).

Theoretical Framework

Bandura's (1993) self–efficacy theory was the theoretical framework of this study. The self–efficacy theory describes how people perform skills and react to events is influenced by their feelings of self–efficacy (Bandura, 1993). Bandura (1997) said the affect of self–efficacy plays a role in an adult's motivation to participate in an activity. Self–efficacy will influence how adults think, form attitudes, motivate themselves, and function (Bandura, 1997). Educator self–efficacy explains an instructor's confidence in his/her aptitude to produce learner engagement and learning outcomes (Tschannen–Moran & Woolfolk Hoy, 2001).

Individuals with high self–efficacy tackle challenging endeavors due to the chance to succeed (Bandura, 1997). The opportunity for success motivates an interest and involves those adults in the subject matter. High self–efficacy individuals create elevated objectives and maintain vigorous dedication to those goals. These individuals exert additional attempts to accomplish responsibilities amid disappointments. High self–efficacy individuals are success oriented (Bandura, 1993).

Low self–efficacy adults are more likely to give–up in the face of trials. Individuals possessing low self–efficacy may remain involved in an activity but avoid responsibilities in which they feel least efficacious. Low teaching efficacy educators produce inferior learning outcomes from participants as compared to high teaching efficacy educators (Tschannen–Moran & Woolfolk Hoy, 2001).

Peronto and Murphy (2009) indicated MGs educate Cooperative Extension clientele with the knowledge and skills gained through training. MGs' instructional efficacy could be improved throughout the initial training process as identified in literature under the broad definition of agricultural education. Kelsey (2007) indicated the variable characterizing teachers who succeeded in agricultural education was self–efficacy. Previous research suggested an increase in teaching efficacy from preservice teachers after the student teaching experience (Roberts, Harlin, & Ricketts, 2006; Stripling, Ricketts, Roberts, & Harlin, 2008).

Summary of Purpose and Objectives

The objectives reported here were parts of a larger study conducted to develop an understanding of adult participation in the Florida Master Gardener program. The objectives reported here were to:

1. Describe Master Gardeners' efficacy in instructional strategies as volunteer educators.
2. Determine if significant differences existed between efficacy in instructional strategies

based on participant demographics (gender, age, race, education, and income).

Methodology

The findings are part of a larger quantitative study conducted to develop an understanding of adult participation in the Florida MG program. The research design was survey research. Stratified sampling was used to select the sample of participants from the Florida MG program. The portion of the study reported here focused on teaching self–efficacy and demographics of Master Gardeners.

Approximately 3,822 adult participate in the Florida Master Gardener program (E. Eubanks, personal communication, March 8, 2009). According to Cochran (1977), a sample size of 362 usable surveys was required for a confidence interval of +/– 5 when N = 3,822. Response rates reported in recent literature are utilized to determine the potential response rate for future research involving a mail survey with a similar population (Bartlett, Kotrlik, & Higgins, 2001). For mail surveys, 5 to 10 % should be added to the total sample size in order to account for incorrect participant mailing addresses, participants who may have recently passed away, and for questionnaires with incomplete participant responses (Babbie, 1990; Salkind, 1997). The response rate was anticipated to be between 62 and 68% due to response rates in previous research utilizing a mail survey with Master Gardeners (Rexroad, 2003; Schott, 2001; Schrock, 1999; Sutton, 2006). The sample size was 613 Master Gardener participants (362 usable surveys ÷ 65% average response rate × 10% = a sample size of 613).

Ary, Jacobs, Razavieh, and Sorenson (2006) said survey research provides the researcher the opportunity to compress the findings of attributes of dissimilar groups in order to evaluate their attitudes and beliefs. The questionnaire included the instructional efficacy construct from Tschannen–Moran and Woolfolk Hoy's (2001) Teacher Sense of Efficacy Scale (TSES) and questions about participant demographics. The TSES was derived from Bandura's (1993) self–efficacy theory. On the instructional efficacy construct of the TSES, respondents were asked "How much can you do?" with a scale of: 9 = *a great deal*, 7 = *quite a bit*, 5 = *some influence*, 3 = *very little*, and 1 = *nothing*. Content validity was addressed by a team of researchers and MG coordinators at the University of Florida. The researchers pilot tested the TSES on a group of MGs in a county program in Tennessee. Reliability for the instructional efficacy construct of the Teacher Sense of Efficacy Scale for the pilot study was calculated *ex post facto* at .92 and was .93 for this formal study.

The researchers employed the approach outlined by Dillman, Smyth, and Christian (2009) to increase response rate when utilizing a mail questionnaire. The data collection instrument was printed in a booklet layout and then mailed to the sampled population. Six hundred thirteen participants were surveyed and 532 participants returned their completed surveys to the researchers. Thus, the response rate was 86.78%. Two respondent surveys were discarded due to incomplete information. Early and late respondents were compared and no significant differences existed, therefore the findings may be generalized to adult Master Gardeners in Florida (Lindner, Murphy, & Briers, 2001).

The study's objectives were analyzed through the implementation of descriptive statistics, *t*–tests, and analysis of variance. Shavelson (1996) said descriptive statistics assess characteristics of groups in order to measure responses toward a line of questioning. A *t*–test determines whether the difference between two sample means is statistically significant (Ary et al., 2006, ¶3). ANOVA can examine the difference in two or more means. Shavelson reported if the F is significant, then at a minimum one of all potential comparisons between comparisons of means will be significant.

Effect sizes are statistics that evaluate the direction and strength of a difference between two means (Ary et al., 2006). A large effect size is d = .80, a medium effect size is d = .50, and a small effect size is d = .20 (Cohen, 1988). Cohen's definitions of small, medium, and large effect sizes have been widely recognized and implemented into numerous social science studies (Shavelson, 1996). A limitation of the study is the selection of Master Gardener adult participants in Florida. The target population may not be characteristic of Master Gardener programs in other states.

Most of the respondents were women. Women accounted for 73.01% (n = 387) of the responses. Males accounted for 26.90% (n = 143) of the responses. Most respondents were white, accounting for 92.07% (n = 488) of the responses. The majority of respondents (79.43%, n = 421) were 56 years old or older. A large percentage of respondents had obtained some form of higher education. Seventy–nine percent (n = 415) of respondents had earned at least an Associate's Degree. Most respondents (61.32%, n = 325) earned between $24,999 and $99,999 annually.

Findings

The first objective of the study was to describe MGs' efficacy in instructional strategies as volunteer educators. The overall mean for the construct was 6.27 (SD = 1.53). Table 1 illustrates the descriptive statistics for the instructional efficacy construct. Responses ranged from quite a bit (M = 6.66, SD = 1.72) to some influence (M = 5.80, SD = 2.10). The highest means occurred for the questions "How well can you respond to difficult questions from your clients? (M = 6.66, SD = 1.72) and "To what extent can you craft good questions for your clients?"(M = 6.58, SD = 1.79). The lowest mean was associated with the question "How comfortable are you using evaluation strategies?" (M =5.80, SD = 2.10).

Table 1
Descriptive Statistics for the Instructional Efficacy Construct

	N	*M*	*SD*
How well can you respond to difficult questions from your clients?	530	6.66	1.72
To what extent can you craft good questions for your clients?	530	6.58	1.79
How much can you gauge client comprehension of what you have taught?	530	6.28	1.87
To what extent can you provide an alternative explanation or example when clients are confused?	530	6.24	1.80
How much can you do to adjust your information to the proper level for individual clients?	530	6.21	1.74
How well can you implement alternative strategies in your teaching?	530	6.11	1.74
How comfortable are you using evaluation strategies?	530	5.80	2.10

Note. Overall M = 6.27, SD = 1.53. Scale: 9 = *a great deal*, 7 = *quite a bit*, 5 = *some influence*, 3 = *very little*, 1 = *nothing.*

The second objective of the study was to determine if significant differences existed between efficacy in instructional strategies based on participant demographics (gender, age, race, education, and income. There was a significant difference in education, F (4, 520) = 5.55, p < .05. The effect size was negligible (η^2 = .04). Education accounted for 4% of the variance in instructional efficacy. Tukey's post hoc analysis was conducted to determine if differences existed in levels of education. There was a significant difference (p < .05) between respondents who had earned a high school diploma (M = 6.09, SD = 1.42) and those who had earned a Master's Degree (M = 6.69, SD = 1.41). Also, there was a significant difference (p < .05) between respondents who had earned an Associate's Degree (M = 5.83, SD = 1.56) and those who had earned a Master's Degree (M = 6.69, SD = 1.41), and respondents who had earned an Associate's Degree (M = 5.83, SD = 1.56) and those who had earned a Doctoral/Professional Degree (M = 6.65, SD = 1.71). Table 2 illustrates the results. There were no other significant difference in demographic characteristics (gender, race, age, and income) and instructional efficacy.

Table 2
Analysis of Variance for Education and Instructional Efficacy (N = 530)

Education	*N*	*M*	*SD*	*F*	*p*	Effect Size
High School Diploma	113	6.09	1.42	5.55*	.00	.04
Associate's Degree	96	5.83	1.56			
Bachelor's Degree	161	6.28	1.45			
Master's Degree	110	6.69	1.41			
Doctoral/Professional Degree	45	6.65	1.71			

Note: $*p < .01$.

Conclusions

Respondents in this study were homogenous (older, white, women, and educated). MGs are a population that has been determined to be homogenous in other studies (Rohs, Stribilng, & Westerfield, 2002; Rouse & Clawson, 1992; Ruppert et al., 1997; Waliczek, Zajicek & Lineberger, 2005). The guidelines required to participate in Florida MG may align with the homogenous adult demographic characteristics identified from this study.

The first objective was to describe MGs' efficacy in instructional strategies as volunteer educators. Respondents' answers to each of the TSES questions indicated Florida MGs possessed "some influence" to "quite a bit" of instructional efficacy. The results from objective one informs Extension and Florida MG coordinators that MGs instructional efficacy can be improved. Comfort in utilizing evaluation strategies had the lowest mean within the instructional efficacy construct.

The study's second objective was to determine if significant differences existed between efficacy in instructional strategies based on participant demographics (gender, age, race, education, and income). Education was the sole demographic characteristic that had a significant effect on instructional efficacy ($p < .01$). As respondents' level of education went up, adults' level of instructional efficacy went up. The analysis produced no other significant differences in demographic characteristics and instructional efficacy. The results from objective two suggest MGs having little or no experience in higher education may need more preparation than other participants before serving as volunteer educators. Findings from objective two indicate most demographic characteristics are not barriers in improving MGs' instructional efficacy. This is good news for Florida MG coordinators that barriers to improve instructional efficacy in MGs are limited.

Implications

Bandura (1993) said self–efficacy was the extent adults perceive their ability to manage activities that impact their lives. Respondents' level of instructional efficacy indicated adults felt comfortable in their role as volunteer educators. This is important for MG participation due to Cooperative Extension's need for volunteers and specifically those that can serve as effective volunteer educators for their local MG Program. MGs possessing high self–efficacy are more likely to provide high quality learning experiences for clientele. Teaching efficacy influences educator retention and learning outcomes of participants (Tschannen–Moran & Woolfolk Hoy, 2001).

MGs had lower efficacy in evaluation strategies than any other instructional efficacy category. Bandura (1997) reported adults that have lower self–efficacy in specific duties are less likely to participate in activities that require attributes involving those same duties. This could lead MGs to avoid conducting evaluations with their clients. The ability to understand and apply program evaluation is a competency for Extension educators due to program improvement and the knowledge contributed to the profession (Rennekamp & Arnold, 2009).

Cooperative Extension should be concerned if MGs have average or low self–efficacy due to the likelihood adults will discontinue their participation (Tschannen–Moran & Woolfolk Hoy, 2001). Participants who had achieved more formal education had higher means for instructional efficacy than adults with less

formal education. Higher educated adults have had more robust learning experiences, and thus, may translate those experiences to enhanced personal instructional efficacy (Tschannen–Moran & Woolfolk Hoy). The completion of degrees in higher education was related to a higher self–perception of instructional efficacy. Bandura (1997) said success provides adults with confidence and enhances self–efficacy. The success respondents attained in earning advanced degrees may have constructed an improved self–perception of instructional efficacy.

Recommendations

Since the demographic characteristics of Florida MGs have been identified, Florida MG coordinators should take those characteristics into consideration when promoting the program with the purpose of including more participants. Other State MG programs should assess demographic characteristics of their participants. Developing an understanding of the demographic make–up of adults may assist the educator in discerning the future direction of the educational program. The awareness of MG characteristics should assist MG coordinators with better understanding their current and potential audience.

If the Florida MG program seeks to include participants with more demographic diversity, then steps will need to be incorporated to promote the inclusion of adults with characteristics dissimilar than those that emerged from this study. Specific demographic data for each Florida county should be considered when the local MG coordinator promotes and plans their program. The time necessary to be a MG may not be available to all adults. Nonetheless, attempts to market MG to a broader audience should be researched in order for Cooperative Extension to broaden its fleet of volunteer educators and clientele (Peronto & Murphy, 2009). Florida Extension should strive to identify, recruit, and train a more ethnically diverse group of adults as volunteer educators for MG.

More research is needed on the influence of participants' level of education and instructional efficacy. This study found education to be the lone demographic characteristic significantly influencing instructional efficacy for Florida MGs. Further research should be conducted on participant demographic characteristics and instructional efficacy in other state MG programs. A broader understanding of how demographic characteristics influence or do not influence instructional efficacy of MG participants across the U.S. would build upon Bandura's (1997) self–efficacy theory and add to Tschannen–Moran and Woolfolk Hoy's (2001) research on educator's instructional efficacy, as well as to the extension literature.

The inclusion of more quality volunteer educators in the MG program would be a benefit to Florida Extension. The instructional efficacy findings from this study indicate reasons why adults may choose to terminate their involvement in the MG program. If participants have moderate or low instructional efficacy, the likelihood that adults will end MG involvement is increased (Tschannen–Moran & Woolfolk Hoy, 2001). When educators possess high instructional efficacy, they are more likely to remain in their teaching role (Tschannen–Moran & Woolfolk Hoy, 2001). Steps should be taken to enhance MGs' instructional efficacy in order for Florida Extension to get the most "bang for their buck" (Meyer, 1997; Swackhamer & Kiernan, 2005) from volunteer educators, and to ensure that adults continue their participation in this program.

The study's findings suggest MGs instructional efficacy can be improved. MGs felt the least efficacious in their ability to utilize evaluation strategies. MG coordinators are the individuals that train and prepare adults to be volunteer educators in MG. The instructional efficacy of MG coordinators should be assessed to develop an understanding of the educational training needs for those extension personnel.

There are a number of ways to improve Florida MGs instructional efficacy. MGs should have a professional development plan constructed for them in order to assist in improving instructional efficacy. A significant aspect of the plan should include methods to enhance instructional efficacy. This would address cultivating cognitive efficacy in MGs. Cognitive efficacy is the extent to which individuals construct goals according to a personal assessment of their aptitude (Bandura, 1997).

MGs should be provided experiences to practice teaching with clientele. It is possible

that MGs will increase their instructional efficacy at the conclusion of those instructional opportunities as opposed to prior to teaching. Agricultural teachers have indicated an increase in perceived instructional efficacy after the student teaching experience (Roberts et al., 2006; Stripling et al., 2008). This method of practice teaching is yet another approach to enhance MG instructional efficacy. Adults may be more effective as volunteer educators if a higher teaching efficacy is cultivated through teaching experiences prior to officially becoming a MG.

The inclusion of a formal mentoring program is recommended to improve instructional efficacy. More seasoned MGs identified to have high instructional efficacy should be utilized to mentor less seasoned participants in instructional methods. This mentoring system should be researched to identify participants' level of instructional efficacy at the beginning, middle, and the conclusion of the mentoring process. This information would assist researchers, and state and local program planners in learning the value of this type of professional development, and changes could be made to enhance the program accordingly. Implementing additional challenges constructs new motivating differences for individuals to achieve (Bandura, 1993). This facet would provide another method in improving Florida MGs' instructional efficacy.

The study's findings address the National Research Agenda's call to identify competencies needed by agricultural extension practitioners (Osborne, 2007) and enhance the broad base of knowledge in the agricultural education discipline. Results from the study highlighted instructional efficacy as a competency that can be improved in Florida MGs. Developing an understanding of volunteer educator abilities will assist extension agents in preparing and utilizing volunteers. Florida MG's served a broader population of clientele as volunteer educators compared to a single MG coordinator. The economic value of serving as a volunteer educator for Florida Extension was considerable as identified by the former Florida Extension Director. Florida MG coordinators have extensive opportunities to influence and enhance MG instructional efficacy, and thus, provide a more proficient and effective volunteer educator corps for Florida Extension. Those professional development opportunities should be seized in order to improve MG's instructional efficacy due to the time, value, and clientele contacts MGs provide Florida Extension as volunteer educators.

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