

Interactions Among Instructional Efficacy, Motivational Orientations, and Adult Characteristics on Master Gardener Tenure

Robert Strong, Assistant Professor
Texas A&M University

Amy Harder, Assistant Professor
University of Florida

Master Gardeners serve Cooperative Extension as volunteer educators who deliver horticultural knowledge to citizens across Florida by teaching a broader amount of public constituents than can a single extension agent. The economic value of the Master Gardener participation to Florida Extension was nearly \$9,000,000 in 2010. Very little research has been conducted to determine what affects Master Gardener tenure. This study utilized self-efficacy theory and Houle's Typology on adult learning orientations as the overlapping framework to determine what predicts Master Gardener tenure. The research design was survey research, and stratified sampling was implemented to select the population of participants. A mail survey was employed as the data collection method, and the response rate received was 86.78%. Participant age, instructional efficacy, and specific learning orientations were found to significantly affect Master Gardener tenure. Instructional efficacy was the only variable that Master Gardener coordinators can enhance in participants in order to retain quality Master Gardeners. The continued participation from adults in the Master Gardener program improves the goals of Cooperative Extension. This study underscores the importance of preparing current and future Master Gardeners in teaching strategies to retain their participation in order to educate more of the state's citizenry.

Keywords: Master Gardeners, instructional efficacy, motivational orientations, extension education

Introduction

The *National Research Agenda* (Osborne, 2007) stated research is needed to determine the reasons why individuals participate in agricultural extension education programs and to identify the professional competencies of change agents. Over 3,800 adults participate in the Florida Cooperative Extension Master Gardener Program. In 2010, approximately 228 adult Master Gardeners terminated their volunteer service in the program (E. Eubanks, personal communication, January 14, 2011). Master Gardeners are volunteer educators serving as change-agents by delivering horticultural related subject matter to homeowners (Moravec, 2006). The interim Director of Florida Extension said the total value of Florida Master Gardener volunteer hours in 2010 were worth approximately \$8,850,000 to Florida Extension (M. Ferrer-Chancy, personal communication,

January 12, 2011). In 2010, Florida Master Gardeners taught horticultural subject matter to over 71,000 adults (E. Eubanks, personal communication, January 14, 2011).

There are Master Gardener programs in 58 of the Florida's 67 counties. The requirements to develop into and continue certification as a Florida Master Gardener are rigorous. Adults apply and go through an interview process before being accepted to the Florida Master Gardener program. Individuals are notified if they are accepted to participate and then are required to pay \$100 for course materials. Master Gardeners meet once a week for a twelve week long course. At the end of the course, adults experience a graduation ceremony from the training. Upon program completion, adults are required to contribute a minimum of 75 volunteer hours annually to the county program in order to continue certification as a Florida Master Gardener. Master Gardeners receive

training from the Master Gardener coordinator throughout the year and their tenure in the program.

Teaching others how to solve problems is one of the primary reasons adults choose to volunteer (Corporation for National and Community Service, 2007). Adults are more likely to continue participation in Master Gardener when they are confident in their volunteer duties (Swackhamer & Kiernan, 2005). Master Gardeners teach the public gardening information through a variety of delivery methods. Using demonstrations or lectures for groups, answering individual telephone calls, identifying plants or plant diseases through face-to-face interaction, and responding to questions via social media outlets are some of the approaches that Master Gardeners utilize to teach the general public. It is important for Extension to prepare Master Gardeners accurately and proficiently as educators (Young, 2007).

Literature has identified reasons adults initially participate in Master Gardener. Adults primarily begin participating in Master Gardener in order to learn new information (Moravec, 2006; Strong, & Harder, 2010; Wolford, Cox, & Culp III, 2001). Schrock (1999) found Master Gardeners participated for a desire to serve the community. Participants got involved with Master Gardener to gain a sense of belonging to a group (Rohs, Stribling, & Westerfield, 2002). However, literature has yet to identify what affects Master Gardener tenure. Strong and Harder (2010) suggested more rigorous research is needed to understand Master Gardener tenure.

Theoretical Framework

Bandura's (1993) self-efficacy theory and Houle's (1961) Typology were combined to construct the theoretical framework of this study. Self-efficacy is researched in order to understand a population's perceived ability to achieve a goal (Coronado-Aliegro, 2008). Researchers continue to use Houle's Typology to improve understanding, promote further research, and to provide organizations characteristics of adult participants (Arsenault, 1998). The combined theories were implemented to address the research objectives.

Bandura (1993) said self-efficacy theory explains how individuals carry out tasks and

respond to experiences shapes perceived self-efficacy. An adult's motivation to take part in an activity is affected by self-efficacy. Bandura (1997) suggested self-efficacy will impact how individuals think, form attitudes, motivate themselves, and work. Tschannen-Moran and Woolfolk Hoy (2001) indicated educator self-efficacy accounts for an instructor's confidence in teaching capacity to generate learner engagement and learning outcomes.

Bandura (1997) said individuals with high self-efficacy deal with difficult tasks for the opportunity to succeed. The potential of accomplishment stimulates relevance and draws in individuals to the activity. Elevated objectives and a vigorous dedication to goals are products of high self-efficacy individuals. High self-efficacy individuals put forth additional efforts to complete responsibilities in the midst of disappointments. Bandura (1993) indicated high self-efficacy adults are success oriented.

Low self-efficacy adults are more likely to discontinue participation during challenging ordeals. Additionally, low self-efficacy individuals may remain involved in an organization but steer clear of less efficacious responsibilities. Tschannen-Moran and Woolfolk Hoy (2001) suggested educators with low teaching efficacy create mediocre learning outcomes for participants in comparison to high teaching efficacy educators.

Houle's (1961) Typology was the other half of the theoretical framework implemented for this study. There are three adult learning orientations that make-up Houle's Typology. Learning-oriented adults participate in an educational program primarily for the objective of learning new information. Activity-oriented adults are motivated to participate for the objective of creating a social relationship with others. Loneliness can lead an adult to a continued learning opportunity (Houle, 1961). Goal-oriented individuals are motivated primarily to accomplish a specific objective they, a current employer or agency has established. Educational programs will attract adults for different reasons and all three learning orientations but each individual participates for their respective ambitions. Houle said no particular orientation is better than another but adult educators should develop a comprehension of each learning orientation in order to best

serve participant needs throughout the educational program.

Houle (1961) identified common characteristics of adults who participate in continued learning experiences. Adults with higher annual incomes participate in continued learning experiences than low income adults. Older adults are more likely to participate in educational programs than younger adults. Adults who have earned a higher education degree are more apt to participate in continued learning programs versus adults who have not. Regardless of demographic characteristics, the one attribute that all adults have in common is that they are all perpetual learners (Houle, 1961).

Purpose of the Study

The purpose of this study was to develop an understanding of adult participation in the Florida Master Gardener program. Specifically the objectives of the study were to:

1. Describe any existing relationships between efficacy in instructional strategies and motivational orientations for adults participating in Florida Master Gardener.
2. Describe the effects of demographics, efficacy in instructional strategies and motivational orientations on Florida Master Gardener tenure.

Methodology

The findings are part of a larger quantitative study conducted to develop an understanding of factors related to the enrollment and retention of Florida Master Gardeners. The research design was survey research. Stratified sampling was used to select the population of participants from the Florida Master Gardener program. The Florida Master Gardener program has approximately 3,822 participants.

A sample size of 362 usable surveys was required for a confidence interval of +/- 5 when $N = 3,822$ (Cochran, 1977). Bartlett, Kotrlik, and Higgins (2001) said 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. Babbie (2007) suggested 5 to 10%

be added to the total sample size for mail surveys in order to account for incorrect participant mailing addresses, participants who may have recently passed away, inaccurate mailing addresses and for questionnaires with incomplete participant responses. Previous research utilizing a mail survey with Master Gardeners produced response rates between 62% and 68% (Rexroad, 2003; Schott, 2001; Sutton, 2006). The sample size was 613 Master Gardener participants.

The questionnaire included three sections. Mergener's (1979) Education Participation Scale (M-EPS) highlighting adult learning orientations was the first section of the questionnaire. The instructional efficacy construct from Tschannen-Moran and Woolfolk Hoy's (2001) Teacher Sense of Efficacy Scale (TSES) was the second section. Questions regarding participant demographics composed the third and final section of the questionnaire.

Mergener (1979) introduced his version of the Education Participation Scale consisting of forty-three items as a product of Houle's (1961) adult learning typology. Each component of the M-EPS contained more in-depth descriptions related to motivational orientations due to the depth of the scale. Mergener said the M-EPS was composed of six factors describing adult learning orientations: Competency-related Curiosity (Learning), Interpersonal Relations (Socialization), Community Service, Escape from Routine (Vary Routine), Professional Advancement (Professional Enhancement), and Compliance with External Influence (Other's Perceptions). Mergener's Education Participation Scale measured variables on a five-point scale: 1 = *very much influence*, 2 = *much influence*, 3 = *moderate influence*, 4 = *little influence*, 5 = *very little influence*.

The TSES was derived from Bandura's (1993) self-efficacy theory. The instructional efficacy construct of the TSES asked respondents seven items in regards to perceived teaching capacity (*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* (Tschannen-Moran & Woolfolk Hoy, 2001). Gender, race, age, education, income, and length of residence in Florida were the demographic questions asked to respondents.

The researcher's pilot tested the questionnaire on a group of Master Gardeners in

a county program in Tennessee. A team of researchers and Master Gardener coordinators from the University of Florida addressed content validity of the questionnaire. Reliability for the questionnaire was calculated *ex post facto* for the formal study at .94, and the pilot study .92.

The researchers utilized the methods outlined by Dillman, Smyth, and Christian (2009) to increase response rate from participants when instituting 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 pulled from the study due to incomplete information. Early and late respondents were compared, and no significant difference existed. Therefore, the results can be generalized to the target population (Lindner, Murphy, & Briers, 2001).

Correlation coefficients were utilized to describe any existing relationships between efficacy in instructional strategies and motivational orientations for adults participating in Florida Master Gardener. Agresti and Finlay (2009) said correlation coefficients are calculated to represent the correlation. Pearson's *r* reveals the strength and direction of the association among two variables (Agresti & Finlay, 2009). Correlations define the association among variables as positive or negative. A value of $r = +.70$ or higher indicates a very strong association, $+.50$ to $+.69$ signifies a substantial positive association, $+.30$ to $+.49$ is a moderate positive association, $+.10$ to $+.29$ suggests a low positive association, $+.01$ to $+.09$ implies a negligible positive association, $.00$ means no association exists, $-.01$ to $-.09$ indicates a negligible negative association, $-.10$ to $-.29$ denotes a low negative association, $-.30$ to $-.49$ represents a moderate negative association, $-.50$ to $-.69$ suggests a substantial negative association, and $-.70$ or lower indicates a very strong negative association (Davis, 1971).

Poisson regression was employed to measure the dependent variable's (Florida Master Gardener tenure) relationship to explanatory variables (demographic characteristics, instructional efficacy, and motivational orientations). Poisson regression models are employed to predict data counts such

as number of germinated corn seed, number of hatched eggs, etc. (Agresti & Finlay, 2009). In this study, tenure (total number of years as a Master Gardener) was treated as count data because it has not been established that Master Gardeners with longer tenure rank higher in terms of volunteer value than Master Gardeners with shorter tenure. $\text{Log}_e(Y) = \beta_0 + \beta_1X_1 + \beta_2X_2 + \dots + \beta_nX_n$ is a Poisson regression model coefficient. McCullagh and Nelder (1983) suggested the Poisson regression model assists the researcher by articulating the log outcome rate as a linear function of a set of predictors. The researchers utilized model Chi-Square and Deviance statistics, as outlined by Mittlböck and Waldhör (2000), for the model fit for the Poisson regression analysis.

Findings

A limitation of the study is the selection of Master Gardener adult participants in Florida. The target population may not be characteristic of other Master Gardener programs in other states. In this study, women accounted for 73.01% ($n = 387$) of the responses and whites accounted for 92.07% ($n = 488$) of the responses. The majority ($n = 421$, 79.43%) of respondents were 56 years old or older. Seventy percent of respondents ($n = 421$) 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 earned between \$24,999 and \$99,999 annually. Adults indicating their annual income was between \$24,999 and \$99,999 annually accounted for 61.32% ($n = 325$) of the responses. The vast majority (75.84%, $n = 402$) of the respondents had lived in Florida for at least eleven years. Of those respondents, nearly 40% had lived in Florida for 31 years or more.

The study's first objective was to describe any existing relationships between respondents' efficacy in instructional strategies and the following motivational orientations: (a) Learning, (b) Community Service, (c) Socialization, (d) Vary Routine, (e) Other's Perceptions, and (f) Professional Enhancement.

Learning and Instructional Efficacy exhibited a significant low positive relationship, $r(525) = .23$, $p < .05$ (see Table 1). A significant low positive association existed

between Community Service and Instructional Efficacy, $r(525) = .25, p < .05$. Socialization and Instructional Efficacy exhibited a significant

negligible positive association, $r(525) = .09, p < .05$. No other significant relationships existed.

Table 1

Relationships between Motivational Orientations and Instructional Efficacy (N = 530)

Motivational Orientations	Instructional Efficacy		
	<i>r</i>	<i>p</i>	Magnitude
Community Service	.25	.00**	Low
Learning	.23	.00**	Low
Socialization	.09	.03*	Negligible
Professional Enhancement	.01	.87	Negligible
Other's Perceptions	.01	.90	Negligible
Vary Routine	.00	.93	Negligible

Note. Magnitude: $.01 \geq r \geq .09$ = Negligible, $.10 \geq r \geq .29$ = Low, $.30 \geq r \geq .49$ = Moderate, $.50 \geq r \geq .69$ = Substantial, $r \geq .70$ = Very Strong.

* $p < .05$, ** $p < .01$.

The second objective was to describe the effects of the combined attributes of demographic characteristics, motivational orientations, and efficacy in instructional strategies on Master Gardener tenure. Sixty-five respondents did not identify their level of income. Therefore, $N = 465$ (total number of respondents identifying personal income level) was used in the Poisson regression analysis. Poisson regression was used to assess the net effect of each measure of demographic characteristics, motivational orientations, and instructional efficacy on Master Gardener tenure. The Poisson regression model was significant and indicated a good fit, with $\chi^2(1, N = 465) = 4.96, p < .01$.

A Poisson regression model coefficient is illustrated as: $\log_e(Y) = \beta_0 + \beta_1X_1 + \beta_2X_2 + \dots + \beta_nX_n$. Age was the only demographic characteristic that proved significant ($p < .01$). As age increased one unit, the \log_e of Master Gardener tenure increased .23. Instructional efficacy was significant ($p < .01$) on Master

Gardener tenure as well (see Table 2). As instructional efficacy increased one unit, the \log_e of Master Gardener tenure increased .12.

Socialization, Vary Routine, and Other's Perceptions were the motivational orientations found to be significant ($p < .01$) on Master Gardener tenure. Learning was found to be significant ($p < .05$) on Master Gardener tenure. However as Learning and Socialization increased, Master Gardener tenure decreased. As Learning increased one unit, the \log_e of Master Gardener tenure decreased -.10. When Socialization increased one unit, the \log_e of Master Gardener tenure decreased -.10. As Vary Routine increased one unit, the \log_e of Master Gardener tenure increased .09. As Others' Perceptions increased one unit, the \log_e of Master Gardener tenure increased .14. The Poisson regression model for this study was illustrated as: Master Gardner tenure = $.16 + .23$ Age + $.12$ Instructional Efficacy + $(-.10)$ Learning + $(-.10)$ Socialization + $.09$ Vary Routine + $.14$ Others Perceptions.

Table 2
 Summary of Poisson Regression Analysis of Demographic Characteristics, Instructional Efficacy, and Motivational Orientations on Florida Master Gardener Tenure

	<i>N</i>	<i>B</i>	<i>SE B</i>	<i>P</i>
Intercept	465	.16	.21	
Age	465	.23	.03	.00**
Instructional Efficacy	465	.12	.02	.00**
Socialization	465	-.10	.03	.00**
Vary Routine	465	.09	.03	.00**
Other's Perceptions	465	.14	.03	.00**
Learning	465	-.10	.04	.01*

Note. ** $p < .01$, * $p < .05$.

The researchers tested for interactions among demographic characteristics, motivational orientations, and instructional efficacy in the Poisson model. Age was identified as the sole demographic characteristic that produced a significant interaction ($p < .05$) with other items. The model provided further support that respondents were more likely to continue participating in Master Gardener when they possessed instructional efficacy. There was a significant interaction ($p < .01$) with age and instructional efficacy on Master Gardener tenure. The \log_e of Master Gardener tenure

increased .03 as the expected \log_e count for each unit of instructional efficacy and age increased.

Certain motivational orientations produced significant interactions with age ($p < .01$). When Other's Perceptions and age increased, a \log_e of Master Gardener tenure increased .03. As one unit of Community Service and age increased, a \log_e of Master Gardener tenure decreased -.02. Vary Routine and age produced a significant interaction ($p < .05$) as well. As each unit of Vary Routine and age increased, a \log_e of Master Gardener tenure increased .02 (see Table 3).

Table 3
 Results of Interactions between Instructional Efficacy, Motivational Orientations, and Age on Florida Master Gardener Tenure

	<i>N</i>	<i>B</i>	<i>SE B</i>	<i>P</i>
Instructional Efficacy x Age	465	.03	.00	.00**
Other's Perceptions x Age	465	.03	.01	.00**
Community Service x Age	465	-.02	.01	.00**
Vary Routine x Age	465	.02	.01	.01*

Note. ** $p < .01$, * $p < .05$.

Conclusions

The study's first objective was to describe any existing relationships between efficacy in instructional strategies and motivational orientations for adults participating in the Master Gardener program. Relationships do exist between instructional efficacy and some of the motivational orientations, but not all. A positive relationship existed between Instructional Efficacy and the Learning, Community Service, and Socialization motivational orientations. Learning represented Houle's (1961) learning-oriented classification.

The Community Service motivation represented Houle's goal-oriented classification. Socialization describes Houle's activity-oriented classification. There were no significant associations with Vary Routine, Other's Perceptions and Professional Enhancement between Instructional Efficacy. Vary Routine and Other's Perceptions correlate to the activity-oriented group in Houle's Typology. Professional Enhancement correlates to the goal-oriented classification in Houle's (1961) Typology.

The study's second objective was to describe the effects of the combined attributes of

demographics, efficacy in instructional strategies and motivation orientations on Master Gardener tenure. Based upon Houle's (1961) work, the researchers believed gender, age, race, education, and income would have been significant in determining a portion of Master Gardener tenure. Age was the sole demographic characteristic that was significantly associated with Master Gardener tenure. Age may have been significant toward tenure due to the time requirements of Master Gardener. Older adults may be more likely to have the necessary time required to participate in Florida Master Gardener.

Instructional efficacy and the motivational orientations of Learning, Socialization, Vary Routine, and Others' Perceptions were significantly associated with Master Gardener tenure. Master Gardeners' perceived instructional efficacy impacted their tenure in the Master Gardener program. Participants did not stay involved in Master Gardener to learn or socialize due to the negative significant associations with tenure. The motivational orientations affecting adult tenure in Florida Master Gardener were to vary the routine in their life and to address perceptions from other individuals.

Age, motivational orientations, and instructional efficacy were tested for significant interactions. Older adults with high instructional efficacy, who want to serve their community, and who are concerned with perceptions from other adults are more likely to continue participation in Florida Master Gardener. Relationships did exist between instructional efficacy and motivational orientations, but not for every orientation. Some were positive relationships and some were negative relationships.

Implications

This study builds on the theory bases of Houle (1961) and Bandura (1997). Houle's Typology and Bandura's self-efficacy coalesce to predict Master Gardener tenure. Houle said older adults are more likely to participate in continued learning experiences than younger adults. As this study revealed, age was the lone significant demographic characteristic that affected Master Gardener tenure. Older adults may be more willing and able to participate in

Master Gardener to serve their community and search out a diverse routine in their daily lives.

This study found Master Gardener tenure increased as instructional efficacy of Master Gardeners increased. Bandura (1997) said individuals will continue pursuing interests when they feel confident in their abilities to achieve the goals associated with those interests. The job description for Florida Master Gardeners is to teach horticultural information to local citizens. Tschannen-Moran and Woolfolk Hoy (2001) indicated high instructional efficacy educators achieve higher learning outcomes than low instructional efficacy educators.

Houle (1961) said adults continue participating in learning experiences for different reasons than they became initially involved. Previous literature indicated adults initially participated in Master Gardener to serve the community (Schrock, 1999), to belong to a group (Rohs, Stribling, & Westerfield, 2002), and to learn (Wolford, Cox, and Culp III, 2001). This study found Community Service, Vary Routine and Other's Perceptions affected adults' decision to continue in Master Gardener. The community service orientation is consistent with Shrock's (1999) finding that Master Gardeners join the program to serve their community. It appears that Master Gardeners clearly associate their tenure in the program with an opportunity to add value to their communities. Adults demonstrating Community Service, Vary routine, and Other's Perceptions orientations are likely to be drawn to the Florida Master Gardener program because of the roles those individuals have as volunteer educators in local communities. Individuals will continue pursuing appealing activities when they believe they can achieve the objectives of those pursuits (Bandura, 1997) and older adults are more apt to participate in educational programs to break their routine and learn how to serve others (Houle, 1961).

Conversely, there was a negative relationship with the motivational orientations of Learning and Socialization on Master Gardener tenure. One possible explanation is that Master Gardeners exhibiting those motivational orientations quit the program because it failed to meet their objectives for participation, or ironically, because those objectives were achieved. When adults believe an educational program has accomplished their objectives, they

discontinue their participation (Houle, 1961). Additional research is needed to understand this phenomenon in the context of the Master Gardener program.

Recommendations

The results presented in this study broaden the research base for extension education and offers practitioners methods to enhance Master Gardener in order to retain high quality volunteer educators. The variables presented in this study provided researchers, state and local coordinators information on Florida Master Gardener tenure. Other state Master Gardener programs should seek to understand effects of the combined attributes of demographics, motivation orientations and efficacy in instructional strategies on Master Gardener tenure. This information would be beneficial to national Master Gardener program coordinators in determining Master Gardener tenure and assist Cooperative Extension systems in retaining volunteer educators (Swackhamer & Kiernan, 2005). Future research should study adults who have terminated involvement in Master Gardener to understand reasons associated with turnover.

The findings from objective one uncovered other facets that increase instructional efficacy. Providing Master Gardener's opportunities to teach citizens in instructional teams would address participant motivational orientations (Learning, Community Service and Socialization) and jointly enhance instructional efficacy. This recommendation should assist practitioners to offer experiences that motivate adults to continue with volunteer responsibilities and reduce turnover (Corporation for National and Community Service, 2007). Local coordinators and the state director can focus program promotional material, and the lessons they utilize to train and prepare adults on opportunities to learn, serving the community, and developing social relationships.

Results from objective two revealed numerous recommendations practitioners can improve Florida Master Gardener tenure. Instructional efficacy is a competency needed by Master Gardener's as change agents due to instructional efficacy predicted Florida Master Gardener tenure. In addition to learning horticultural content during the initial twelve

week training program, participants studying to become Master Gardener's should be taught active teaching and learning techniques for adult learners. Teachers who have robust confidence in teaching efficacy create opportunities for learners to master the subject matter (Bandura, 1993). Seasoned Master Gardener's should be provided professional development teaching experiences designed to improve individual's instructional efficacy and clientele's learning outcomes. The findings from this study's second objective reinforce previous recommendations per Strong and Harder (2010) for practitioners to provide training in instructional strategies for current and future Master Gardener volunteers.

The findings from objective two provide practitioners a clear-cut description of what motivates adults to participate in the program (Young, 2007). Learning, Socialization, Vary Routine, and Others' Perceptions motivational orientations were significantly related to Master Gardener tenure. The state and local coordinators should ensure the Florida Master Gardener program addresses these needs through instruction and opportunities presented participants as volunteer educators. Addressing participant needs will positively affect their continued participation (Houle, 1961).

Older adults may participate in Master Gardener due to the time requirement (minimum 75 hours annually) to serve as a volunteer educator. Master Gardener coordinators should continually strive to market Master Gardener to adults of all ages in order to broaden the potential of including participants with diverse backgrounds in the program. Spouses that are homemakers or unemployed may provide practitioners more volunteer educators (Master Gardeners) given the time requirement. Adults too disabled for employment may offer coordinators more sources as volunteer educators. Alternatively, Florida Extension may consider reducing the number of required volunteer hours per year in order to attract more participants.

The economic value and clientele contacts that Master Gardener's provided Florida Extension in 2010 were enormous. However, this study provided insight into some ways to improve Master Gardener tenure and develop a competency needed by Master Gardener's as change agents. This study found preparing

Master Gardener's to be better volunteer educators will enhance the likelihood adults will remain in the program and serve as high quality volunteer educators. Cooperative Extension will

reap the benefits of prolonged high quality Master Gardener participation through the production of increased learning outcomes in clientele.

References

- Agresti, A., & Finlay, B. (2009). *Statistical methods for the social sciences* (4th ed.). Upper Saddle River, NJ: Prentice Hall.
- Arsenault, N. (1998). Typologies and the leisure learner. *Ageing International*, 24(2-3), 64-74. doi: [10.1007/s12126-9981005-x](https://doi.org/10.1007/s12126-9981005-x)
- Babbie, E. (2007). *The practice of social research* (11th ed.). Belmont, CA: Wadsworth.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: W. H. Freeman and Company.
- Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*, 28(2), 117-148.
- Bartlett II, J. E., Kotrlik, J. W., & Higgins, C. C. (2001). Organizational research: Determining appropriate sample size in survey research. *Information Technology, Learning and Performance Journal*, 19(1), 43-50.
- Cochran, W. G. (1977). *Sampling techniques* (3rd ed.). New York, NY: John Wiley & Sons.
- Coronado-Aliegro, J. (2008). The relationship between self-efficacy and self-assessment in foreign language education: A pilot study. *Journal of Literature, Language and Linguistics*, 2(1), 1-4.
- Corporation for National and Community Service. (2007). *Strategic plan 2006-2010* (Report No CNS0506). Retrieved from http://www.nationalservice.gov/about/focus_areas/2006.asp
- Davis, J. (1971). *Elementary survey analysis*. Englewood Cliffs, NJ: Prentice Hall.
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2009). *Internet, mail and mixed-mode surveys: The Tailored Design Method* (3rd ed.). New York, NY: John Wiley & Sons.
- Houle, C. O. (1961). *The inquiring mind*. Madison, WI: University of Wisconsin Press.
- Lindner, J. R., Murphy, T. H., & Briers, G. E. (2001). Handling nonresponse in social science research. *Journal of Agricultural Education*, 42(4), 43-53. doi: [10.5032/jae.2001.04043](https://doi.org/10.5032/jae.2001.04043)
- McCullagh, P., & Nelder, J. A. (1983). *Generalized linear models*. London, England: Chapman and Hall, Inc.
- Mergener, M. A. (1979). The motivational orientations of pharmacists toward continuing education (UMI No. 7820638). *Dissertation Abstracts International*, 39(08), 3775B.
- Mittlböck, M., & Waldhör, T. (2000). Adjustment for R²-measures for Poisson regression models. *Computation Statistics and Data Analysis*, 34, 461-472.

- Moravec, C. (2006). Continuing education interests of Master Gardener volunteers: Beyond basic training. *Journal of Extension*, 44(6). Retrieved from <http://www.joe.org/joe/2006december/rb5.php>
- Osborne, E. W. (Ed.) (2007). *National research agenda: Agricultural education and communication, 2007-2010*. Gainesville, FL: University of Florida, Department of Agricultural Education and Communication.
- Rexroad, T. D. (2003). Evaluation of marketing methods used to promote extension programs as perceived by Master Gardeners in West Virginia (UMI No. 1409750). *Manuscript Abstract International*, 41(04), 0127B.
- Rohs, F. R., Stribilng, J. H., & Westerfield, R. R. (2002). What personally attracts volunteers to the Master Gardener Program? *Journal of Extension*, 40(4). Retrieved from <http://www.joe.org/joe/2002august/rb5.shtml>
- Schott, N. J. (2001). Volunteer motivation and satisfaction associated with the University of Illinois Extension Master Gardener program (UMI No. 9990131). *Dissertation Abstracts International*, 61(10), 3847A.
- Schrock, D. S. (1999). A functional approach to understanding and assessing the motivation and retention of university extension Master Gardener volunteers (UMI No. 9913378). *Dissertation Abstracts International*, 59(12), 6508B.
- Strong, R., & Harder, A. (2010). Motivational orientation of adults participating in the Cooperative Extension Master Gardener Program. *Journal of Extension*, 48(4). Retrieved from, <http://www.joe.org/joe/2010august/rb2.php>
- Strong, R., & Harder, A. (2010). Master Gardener's teaching efficacy and demographic characteristics as volunteer educators for Cooperative Extension. *Journal of Southern Agricultural Education Research*, 60, 14-24.
- Sutton, E. A. (2006). An evaluation of the Master Gardener Program in Arkansas (UMI No. 15456). *Dissertation Abstracts International*, 44(05), 97A.
- Swackhamer, E., & Kiernan, N. E. (2005). A multipurpose evaluation strategy for Master Gardener Training Programs. *Journal of Extension*, 43(6). Retrieved from, <http://www.joe.org/joe/2005december/a4.php>
- Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education*, 17, 783-805.
- Wolford, M., Cox, K., & Culp III, K. (2001). Effective motivators for master volunteer program development. *Journal of Extension*, 39(2). Retrieved from <http://www.joe.org/joe/2001april/rb4.html>
- Young, L. (2007). Re-designing a Master Gardener training program to meet the changing needs of volunteers and Cooperative Extension. *Journal of Extension*, 45(5). Retrieved from, <http://www.joe.org/joe/2007october/iw2.php>

ROBERT STRONG is an Assistant Professor in the Department of Agricultural Leadership, Education, and Communications at Texas A&M University, 2116 TAMU, College Station, TX 77843, r-strong@tamu.edu

AMY HARDER is an Assistant Professor in the Department of Agricultural Education and Communication at the University of Florida, P.O. Box 110540, Gainesville, FL 32611, amharder@ufl.edu