

## **Master Gardener Satisfaction and Intent to Remain After Training via Remote Delivery**

### **Abstract**

One year after using remote delivery via video web conferencing (VWC) in training, we surveyed Delaware master gardeners to assess the remote delivery trainees' satisfaction and intent to remain as compared to those characteristics in volunteers who had had face-to-face training. Although the remote delivery trainees were satisfied overall, they were significantly less satisfied than those who had participated in face-to-face trainings. A more positive perception of the VWC experience was associated with master gardeners' increased satisfaction, suggesting the importance of VWC quality. However, volunteers trained via VWC did not report more or less of an intention to remain with the organization.

**Keywords:** [volunteer satisfaction](#), [retention](#), [master gardener](#), [remote delivery](#), [video web conferencing](#)

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## **Introduction and Literature Review**

Through the master gardener program, which started in Washington State in 1972, experienced gardeners are trained to share their expertise with others in their respective states (Bobbitt, 1997). Now present in 49 states, master gardeners are a critical resource in Extension's effort to improve consumer horticulture education (Bradley et al., 2016; Dorn, Newberry, Bauske, & Pennisi, 2018; Schrock, Meyer, Ascher, & Snyder, 2000). Once trained, master gardeners constitute a cost-effective means for reaching a wide variety of community members. However, the initial master gardener training can be expensive to provide. To defray or cover costs, some state Extension organizations require volunteers to pay for training courses, with published costs ranging from approximately \$195 to \$450 as of fall 2017 (Iowa State University Extension and Outreach, n.d.; Oregon State University, n.d.). A strategy for reducing master gardener training costs is

to use distance education to reach multiple locations with one face-to-face training, limiting Extension professionals' travel and saving both time and financial resources (Marble, Fulcher, & Toman, 2016; McGinnis, 2016; Stack, 1997; Warmund & Schrock, 1999). Although measured learning outcomes from remote and face-to-face master gardener training are primarily equivalent, researchers have identified differences and expressed concerns regarding reduced volunteer retention (Stack, 1997) and technical limitations (Barton, Barton, & Ilvento, 2016; McGinnis, 2016; Warmund & Schrock, 1999) associated with distance learning. An effective master gardener training program requires volunteers not only to be prepared for their work but also to be retained long enough for Extension programs to reap the benefit of investing in their training.

In 2015, master gardener training in Delaware involved a hybrid delivery method comprising face-to-face and remote sessions. In Delaware, volunteer programs are organized at the county level, but training in 2015 was statewide. When trainees from one county were in a live session, trainees in the state's two other counties were trained remotely via Zoom, a video web conferencing (VWC) platform. In an initial investigation, we found that master gardener trainees were equally able to answer application questions on session content after face-to-face and remote instruction via VWC when considering all the sessions together (Barton et al., 2016). However, when evaluating each session separately, we identified two sessions for which face-to-face learners outperformed those who were trained remotely (Barton et al., 2016). Both sessions were hosted at a site with particularly low bandwidth, and we postulated that technical difficulties as opposed to the delivery format itself were responsible for the significant learning differences (Barton et al., 2016). Additionally, when asked to evaluate the remote sessions in terms of their similarity to in-person instruction, referred to as media naturalness (Kock, 2005), participants on average rated the remote sessions poorly (Barton et al., 2016). Alternatively, trainees' overall perceptions of the training were predominantly positive, suggesting that positive aspects of the training outweighed any low technical functionality of the remote environment (Barton et al., 2016). Researchers studying Iowa Master Gardeners found similar results in terms of volunteer preferences, as respondents favored live presentations and workshops over video presentations and webinars (Takle, Haynes, & Schrock, 2016).

Given the clear need to maximize master gardener training efforts, it is important to consider the impact of initial training format on volunteer satisfaction and retention in addition to learning and application of knowledge. Volunteer satisfaction can be associated with the amount of time individuals spend volunteering (Finkelstein, 2008) or their intentions to remain with an organization (Galindo-Kuhn & Guzley, 2001). Decreases in either of these variables undermine the cost savings afforded by distance education in training due to the need to recruit and train additional volunteers to cover responsibilities or replace those who leave. The purpose of the study we describe herein was to follow up 1 year after the 2015 training to explore volunteer satisfaction and planned tenure of master gardeners who participated in a combination of face-to-face and remotely delivered training (henceforth referred to as VWC training) as compared to their peers who participated in earlier fully face-to-face training.

Specifically, we sought to answer the following research questions:

1. What is the relationship between master gardeners' *participation in training via VWC* and their
  - a. perceived volunteer satisfaction?

- b. intent to remain with the master gardener organization as a volunteer?
2. What is the relationship between master gardeners' *rating of VWC in terms of similarity to in-person instruction* and their
- a. perceived volunteer satisfaction?
- b. intent to remain with the master gardener organization as a volunteer?

## Methods

To evaluate trainees' satisfaction and intent to remain with the master gardener organization after VWC training, we distributed a survey to all current master gardeners that included questions about their participation in the master gardener program, satisfaction as volunteers, and intent to remain with the organization. We emailed a link to the online survey in January 2017, mailed hard copies to those who did not complete the digital version in February 2017, and closed survey collection at the end of March 2017. We sent surveys to 282 volunteers (40 trainees from 2015, 242 previously trained volunteers).

The survey included six sections: demographics, volunteer participation, volunteer satisfaction, training and learning opportunities, connection to sponsoring organizations, and intent to remain with Delaware Master Gardeners. Here, we focus on volunteer satisfaction, remote delivery trainees' evaluation of their training and learning opportunities, and intent to remain with the organization. Demographic information and volunteer participation were covariates in our analyses. We measured master gardeners' satisfaction by using the Volunteer Satisfaction Index (VSI) (Galindo-Kuhn & Guzley, 2001), considering organizational support (12 items,  $\alpha = .93$ ), participation efficacy (7 items,  $\alpha = .88$ ), empowerment (3 items,  $\alpha = .73$ ), and group integration (4 items,  $\alpha = .91$ ). Volunteers indicated their level of satisfaction with each item (e.g., "The availability of getting help when I need it") on a scale of 1 (*very dissatisfied*) to 7 (*very satisfied*). If master gardeners were trained in 2015 and thus received the VWC training, we asked them to rate their experience as a learner on a scale of 1 (*very challenging*) to 7 (*not at all challenging, the same as if it were in-person instruction*). Finally, we asked participants to rate their intent to remain with the organization for 1 year and 3 years, barring unforeseen changes, on a scale of 1 (*certainly not*) to 7 (*certainly*).

To predict master gardeners' volunteer satisfaction, we used robust multiple linear regression models that account for outlier influential data points by weighting observations. We chose to use this type of model for predicting volunteer satisfaction based on increases in model fit, as measured by adjusted  $R^2$  values. To predict volunteers' intent to remain with the organization, we used a multiple linear regression model with Huber-White robust standard errors to account for possible heteroscedasticity, unequal variance in the dependent variable (intent to remain in the organization) across values of the independent variable (participation in VWC training versus face-to-face training). The covariates are consistent across all models: gender, county, education, gardening frequency, years as a master gardener, total number of master gardener activities, and survey response mode. By including these covariates, we held volunteer characteristics (e.g., years of experience) constant to identify the association between VWC training participation and satisfaction or intent to remain. We included survey response mode to account for measurement error introduced by two different question display styles, but we did not interpret significance. We used Stata Version 14 for all analyses.

## Results

We received responses from 198 of the 282 distributed surveys (24 trainees from 2015, 174 previously trained volunteers), for a 70.2% response rate overall and a 60.0% response rate for the 2015 VWC-trained cohort. The demographics of our sample are similar to those of the national trends for master gardener volunteers (Dorn et al., 2018), with majorities of the responding master gardeners being female (149, 77.2%), White (182, 91.9%), and college educated (136, 70.1%) and the mean age being 70.5 years old (Table 1).

**Table 1.**

Delaware Master Gardener Survey Respondents' Demographic, Gardening Experience, and Volunteerism Characteristics

<b>Variable</b>	<b><i>M (SD)</i></b>	<b>Range</b>	<b>No. responding<sup>a</sup></b>	<b><i>f (%)<sup>b</sup></i></b>
Age	70.45 (7.61)	33–91 <sup>c</sup>	187	
Gender (female)			193	149 (77.20)
County			197	
County A				86 (43.88)
County B				44 (22.45)
County C				66 (33.67)
Ethnicity (White)			191	182 (91.92)
Education			194	
< 4-year bachelor's degree				58 (29.90)
4-year bachelor's degree				61 (31.44)
Master's degree				63 (32.47)
Terminal degree (PhD, JD, etc.)				12 (6.19)
Gardening frequency	7.23 (2.25)	1–12	195	
Years as a master gardener	9.96 (7.00)	1–30	196	
< 4 years				46 (23.23)
5–9 years				64 (32.32)
10–14 years				39 (19.70)
15–19 years				24 (12.12)
20–24 years				13 (6.57)
25–30 years				10 (5.05)
Total number of activities	6.81 (2.67)	1–14	197	

Research in Brief	Master Gardener Satisfaction and Intent to Remain After Training via Remote Delivery	JOE 57(4)
Desired volunteer frequency	196	
More		35 (17.86)
Less		16 (8.16)
Same amount		145 (73.98)

aNumber of master gardeners responding to question. bPercentages are based on number of master gardeners who responded to the item. c33 is an outlier for age; the next lowest reported age is 51.

## Volunteer Satisfaction

Although the master gardener respondents were overall highly satisfied with the Delaware Master Gardener organization, as indicated by an average total satisfaction rating of 6.00 out of 7.00 (Table 2), master gardeners who trained via VWC had a significantly lower total satisfaction rating ( $M = 5.63$ ).

**Table 2.**  
Master Gardener Volunteer Satisfaction Based on Total Satisfaction

Variable	Overall			Trained via VWC in 2015		
	<i>M</i> ( <i>SD</i> )	Range	No. responding <sup>a</sup>	<i>M</i> ( <i>SD</i> )	Range	No. responding <sup>a</sup>
Total satisfaction <sup>b</sup>	6.00 (0.92)	1.27–7.00	178	5.63 (1.13)*	2.19–7.00	23
1. Organizational support <sup>c</sup>	6.00 (0.99)	1.33–7.00	178	5.60 (1.21)	1.92–7.00	23
2. Participation efficacy <sup>c</sup>	5.83 (0.93)	1.29–7.00	195	5.60 (0.97)	2.57–7.00	24
3. Empowerment <sup>c</sup>	6.17 (0.95)	1.33–7.00	195	5.81 (1.25)	1.67–7.00	24
4. Group integration <sup>c</sup>	6.07 (1.16)	1.00–7.00	195	5.80 (1.45)	1.50–7.00	24

Note. VWC = video web conferencing.

aNumber of master gardeners varied based on who responded to aligned questions. bAggregate score of all Volunteer Satisfaction Index (VSI) items (Galindo-Kuhn & Guzley, 2001) measured on a scale of 1 (*very dissatisfied*) to 7 (*very satisfied*) for each item (e.g., "The availability of getting help when I need it"). cAggregate score of VSI item aligned with organizational support, participation efficacy, empowerment, or group integration.

\* $p \leq .05$  level; volunteers trained via VWC report significantly lower satisfaction than volunteers overall.

In Table 3, each model is a regression of VWC training participation (Models 1–5) or VWC experience (Models 6–10) on total satisfaction and on satisfaction by subscale (organization support, participation efficacy, empowerment, and group integration). We found that VWC trainees were 0.17 standard deviations less satisfied than those who had participated in the traditional face-to-face trainings prior to 2015, when all covariates were held at their means ( $p = .021$ ; Model 1, Table 3). However, their overall reduced satisfaction was not clearly attributable to one subscale of the VSI. That is, they were not significantly less satisfied by organizational support (Model 2), participation efficacy (Model 3), empowerment (Model 4), or group integration (Model 5). There was a significant positive association between master gardeners' rating of their

VWC experience and their volunteer satisfaction. With every one-unit increase in their rating of their VWC experience, master gardeners' total satisfaction increased by 0.39 standard deviations, with all covariates being held at their means ( $p = .002$ ; Model 6, Table 3). Considering the subscales of the VSI, master gardeners' rating of their VWC experience was significantly positively associated with organizational support ( $p < .001$ ; Model 2, Table 3) and empowerment ( $p < .001$ ; Model 4, Table 3). With every one-unit increase in their rating of the VWC experience, their satisfaction in those areas increased by .48 and .62 standard deviations, respectively. Notably, these models explain a significant amount of the variance in volunteers' satisfaction.

**Table 3.**

Regression Results for Predicting Total Satisfaction and Satisfaction by Subscale from Video Web Conferencing (VWC) Training Participation and Experience Ratings

Variable	Total satisfaction <sup>a</sup>		Organizational support <sup>b</sup>		Participation efficacy <sup>b</sup>		Empowerment <sup>b</sup>		Group integration <sup>b</sup>	
	B		B		B		B		B	
	(SE B) <sup>c</sup>	$\beta^d$	(SE B) <sup>c</sup>	$\beta^d$	(SE B) <sup>c</sup>	$\beta^d$	(SE B) <sup>c</sup>	$\beta^d$	(SE B) <sup>c</sup>	$\beta^d$
	Model 1		Model 2		Model 3		Model 4		Model 5	
VWC training participation	-0.46*	-0.17	-0.39 (0.20)	-0.14	-0.38 (0.25)	-0.14	-0.35 (0.22)	-0.13	-0.17 (0.22)	-0.05
No. responding	173		173		189		189		189	
Adj. R <sup>2</sup> f	.104		.098		.072		.050		.065	

Variable	Total satisfaction <sup>a</sup>		Organizational support <sup>b</sup>		Participation efficacy <sup>b</sup>		Empowerment <sup>b</sup>		Group integration <sup>b</sup>	
	B		B		B		B		B	
	(SE B) <sup>c</sup>	$\beta^d$	(SE B) <sup>c</sup>	$\beta^d$	(SE B) <sup>c</sup>	$\beta^d$	(SE B) <sup>c</sup>	$\beta^d$	(SE B) <sup>c</sup>	$\beta^d$
	Model 6		Model 7		Model 8		Model 9		Model 10	
VWC experience rating	0.25**	0.39**	0.25***	0.48***	0.13 (0.06)	0.25	0.41***	0.62***	0.12 (0.12)	0.16
No. responding <sup>e</sup> , g	22		21		24		24		24	
Adj. R <sup>2</sup> f	.717		.905		.563		.983		.396	

Note. Unlisted covariates controlled for include gender, county, education, gardening frequency, years as a master gardener, total number of activities, and survey response mode.

<sup>a</sup>Aggregate score of all Volunteer Satisfaction Index (VSI) items (Galindo-Kuhn & Guzley, 2001) measured on a scale of 1 (*very dissatisfied*) to 7 (*very satisfied*) for each item. <sup>b</sup>Aggregate score of VSI items aligned with organizational support, participation efficacy, empowerment, or group integration. <sup>c</sup>Unstandardized regression coefficient. <sup>d</sup>Standardized regression coefficient. <sup>e</sup>Number of master gardeners varied based on who responded to all satisfaction questions overall or in satisfaction

subgroup. <sup>f</sup>Measure of explained variance between respondents in outcome (e.g., total satisfaction). <sup>g</sup>Sample for VWC

experience included only volunteers who participated in 2015 remote delivery training.

\* $p \leq .05$ . \*\* $p \leq .01$ . \*\*\* $p \leq .001$ .

## Intent to Remain with Delaware Master Gardener Organization

Most master gardeners believed they would still be with the organization within the subsequent 1 year ( $M = 6.44$  out of 7.00) and the subsequent 3 years ( $M = 5.91$  out of 7.00) (Table 4). Although master gardeners who trained via VWC had higher confidence in their intent to remain with the organization for 1 year ( $M = 6.83$ ) and 3 years ( $M = 6.58$ ) (Table 4), these are not statistically significant differences and are expected given that they are new to the program. Additionally, we did not identify a significant association between volunteers' ratings of their VWC experience and their intent to remain with the organization.

**Table 4.**

Master Gardener Intent to Remain as a Volunteer with the Organization

Variable	Overall			Trained via VWC in 2015		
	<i>M (SD)</i>	Range	No. responding <sup>a</sup>	<i>M (SD)</i>	Range	No. responding <sup>a</sup>
Intent to remain <sup>b</sup>						
1 year from now	6.44 (1.24)	1–7	190	6.83 (0.48)	1–7	24
3 years from now	5.91 (1.63)	1–7	189	6.58 (0.93)	1–7	24

Note. VWC = video web conferencing.

<sup>a</sup>Number of master gardeners varied based on who responded to aligned questions. <sup>b</sup>Intent to remain with Delaware Master Gardeners measured on a scale of 1 (*certainly not*) to 7 (*certainly*).

## Discussion and Conclusion

Although master gardeners who participated in VWC training in 2015 were overall less satisfied as volunteers than those who trained prior to 2015, their decreased satisfaction is not clearly attributable to one satisfaction component (organizational support, participation efficacy, empowerment, or group integration). Additionally, it is important to consider that the majority of master gardeners who trained with remote delivery still categorized themselves as satisfied. Interestingly, for those who trained with remote delivery, the variation in satisfaction seems to be associated with their perception of the VWC training experience. Those who perceived the VWC to be more similar to face-to-face instruction rated their volunteer satisfaction higher. In particular, they felt higher satisfaction in organizational support and empowerment. These components of volunteer satisfaction include interactions between the volunteer and the organizational structures and personnel (e.g., "the availability of getting help when I need it"). They did not feel more satisfied with regard to participation efficacy (i.e., their sense of their impact as a volunteer) or group integration (i.e., their relationships with other volunteers). Although it is possible that individuals who respond positively on one scale simply tend to respond more positively on all scales, the subscale variance suggests that respondents considered and differentiated between the items when responding.

As perception of training experience appears to be important for master gardener volunteer satisfaction in terms of organizational support and sense of empowerment, it is critical for Extension to provide a VWC training experience that master gardeners perceive to be as similar as possible to face-to-face instruction. Elements of providing such an experience might include

- training master gardener program instructors such that they are more comfortable delivering information via VWC,
- ensuring that equipment at all locations is functioning properly at all times,
- using VWC programs that provide split screens to show the remote instructor's body language in addition to other video materials (i.e., Power Point slide sets), and
- offering easy opportunities for trainees at the remote site to interact with the instructor.

VWC can be an effective method of delivering master gardener training in terms of knowledge acquisition (Barton et al., 2016). However, it is necessary to pay close attention to the details that affect perception of the VWC experience to ensure volunteers' long-term satisfaction in their role as master gardeners and maximize knowledge to provide consumer horticulture education.

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