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Enrollment, Retention, and Activity in an Online Master Gardener Course

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Abstract: An online version of the OSU Master Gardener training course was launched in the fall of 2006. Student retention in the online course was comparable to retention in on-site trainings. Students who were most active in the course, measured as the number of optional assignments and quizzes completed, were more likely to score higher on the final exam. Online courses have the capacity to broaden the reach of Extension and to allow individuals who traditionally could not take advantage of programs to become a part of the Extension community.

Introduction and Need

Oregon State University (OSU) Extension Service Master Gardener volunteers extend OSU's ability to assist the citizens of Oregon. After receiving extensive training from OSU Extension faculty, Master Gardeners are certified to provide non-biased, science-based information to citizens who are seeking a diagnosis, advice, or information on a plant, garden, or home horticultural issue. Master Gardener training involves several weeks of coursework (e.g. lectures, quizzes and/or assignment), followed by a volunteer practicum.

Historically, the coursework associated with Master Gardener training is annually offered out of county Extension offices. In all but two of the 28 counties that offered Master Gardener training in 2009, this coursework was scheduled during a weekday. Although this model has been extremely successful in recruiting and training a highly qualified corps of Master Gardener volunteers, the timing of trainings precludes many potential participants from enrolling. In particular, individuals who work during the day are often not in a position to attend the coursework phase of Master Gardener training. Developing and delivering an online version of the Master Gardener training course is one way to enhance Extension's capacity to provide educational opportunities for all Oregonians (Dromgoole & Boleman, 2006).

Online training courses, including an online Master Gardener training course taught at OSU in 2000, have been well received by Extension audiences (VanderZanden, Rost, & Eckel, 2002; Parker, 2009). The earlier offering of an online Master Gardener course was conducted on a limited scale, with a total of 31 students taking the course during a single offering. All 31 of these students took the online course as part of the requirements to earning a Master Gardener badge. Of these 31 students, 10 remain active Master Gardeners nearly 10 years after completing the online course (Langellotto-Rhodaback, unpublished data).

Given the short- and long-term success of online training courses, the potential to broaden the reach of Extension programming, and the opportunity to generate revenue for Extension programs, OSU Extended Campus and Extension Service partnered in 2006 to develop and deliver a new version of the online Master Gardener training course.

In the fall of 2008, a new OSU online Master Gardener training course was launched, with an enrollment cap of 50 students. This offering was limited to those students who were not interested in becoming Master Gardener volunteers, but wanted to learn about home horticulture and sustainable gardening. These students received a Certificate of Home Horticulture upon the successful completion of the course (i.e., score of 70% or higher on the final exam).

The course was offered again in the winter of 2010, with an enrollment cap of 70 students. Of these, 35 slots were reserved for students pursuing a Certificate of Home Horticulture, and 35 slots were reserved for those pursuing a Master Gardener badge. Upon successful completion of the final exam, students pursuing a Master Gardener badge were referred to their local county Extension office for their volunteer practicum.

Course Content and Design

Previous research suggests that Master Gardener volunteers most value the information presented in Master Gardener trainings (Schrock, Meyer, Ascher, & Snyder, 2000). Thus, great care was taken to create a course that is rich in content and easy to navigate. The course consists of 12 modules, which are delivered via the Blackboard Academic Suite. A new module becomes "available" every week, and previously presented modules remain open and accessible. This approach ensures that students stay focused on each week's topic, rather than skimming through the mass of material associated with the entire course. The 12 modules are topic-based, and include (in order):

- Basic botany

- Soils, fertilizers and compost

- Vegetable gardening

- Entomology

- Plant pathology

- Sustainable landscaping

- Herbaceous ornamentals

- Container gardens

- Understanding pesticides
- Integrated pest management
- Woody landscape plants
- OSU Master Gardener Program

Each module consists of:

- A set of learner objectives
- Narrated PowerPoint lectures (created using the PointeCast plug-in for Power Point)
- Pdf versions of associated chapters in the Oregon-Washington Master Gardener Handbook (2003)
- Optional assignments
- Optional quizzes, with instant answer key and feedback
- External supporting links
- Student feedback form

The course is staffed by an OSU Extension faculty member, who serves as the point person for students who have questions, provides comment on all assignments, and ensures that the course is operating effectively.

Because interactivity is known to be positively associated with students' experience in an online course (Edelstein & Edwards, 2002), several venues were created for students to interact with each other within and outside of the course. These include online office hour "chats" and threaded discussions. In addition to encouraging interactivity among class members, these course elements are a means to efficiently answer students' questions. A Facebook group and fan page were set up to provide additional opportunities for social interaction among class members.

Within a module, PowerPoint lectures consist of between three and nine shorter "lecturettes." The lecturette format allows students to work through small segments of the curriculum when they have time, rather than having to commit to an hour or more lecture at one sitting. Staff at OSU Extended campus created verbatim transcripts of associated narrations that can be downloaded for each lecture. Extended Campus staff also acquired copyright permission for all images used in the lectures and in other portions of the course.

Optional, downloadable assignments require students to integrate information learned throughout the course

and to perform independent research. The instructor provides constructive feedback on uploaded assignments. To expedite grading, feedback is usually limited to one paragraph or a few sentences, unless faulty information needs to be corrected.

Course Enrollment, Retention, and Activity

In the fall 2008 offering, a total of 43 students enrolled. Geographically, these students came from 15 Oregon counties, as well as six additional states (CA, NJ, ID, PA, VA, NY) and two countries (Democratic Republic of Georgia, South Korea). In the winter 2009 offering, the course was overenrolled at 73 students. These students hailed from 17 Oregon counties, as well as three additional states (CO, MO, WA) and one US territory (Puerto Rico). In the fall 2009 offering, 60 students, representing 16 Oregon counties, six additional states (CA, PA, WA, TX, NY, HI), and five countries (Denmark, Canada, Mexico, Trinidad, Myanmar) were enrolled in the course. Across all three offerings, a mean of 77% (± 2.3 SE) satisfactorily completed the course (Table 1). This figure is comparable to the 72% (± 5 SE) of the 838 Master Gardener trainees who were trained out of county Extension offices, and completed their coursework and their volunteer practicum (Langellotto, G. A. 2008).

A greater percentage of students who registered to pursue a Master Gardener badge successfully completed the course (86% in the winter 2009 offering), compared to those students who registered to pursue a Certificate of Home Horticulture (73% and 75%, in the fall 2008 and winter 2009 offerings, respectively; Table 1). Students pursuing a Master Gardener badge must successfully complete their service practicum, prior to receiving a badge and in order to become a certified OSU Master Gardener volunteer.

Table 1.

Summary of Student Enrollment and Completion in the OSU Online Master Gardener Course (Fall 2008 and Winter 2009)

Online Master Gardener Course Offering	Total Students Enrolled		Students Enrolled for Certificate of Home Horticulture		Students Enrolled for Master Gardener Badge	
	# Enrolled	% Completing Course	# Pursuing Certificate	% Completing Certificate	# Pursuing Master Gardener Badge	% Moving onto Master Gardener Service Practicum
Fall 2008	45	73	45	73	NA	NA
Winter 2009	73	81	36	75	37	86
Fall 2009	60	77	60	77	NA	NA
Total or Mean \pm SE	178	77 ± 2.3	141	75 ± 1.2	37	86
NA=Not Applicable. The option of the pursuing a Master Gardener badge was not available to those enrolled in the fall 2008 offering.						

The majority of students enrolled were active participants in the course. In the fall 2008 offering, students posted a total of 435 messages on the discussion boards (14.11 messages per student). Optional quizzes were completed by an average of 67% of enrolled students per module and optional assignments were completed by an average of 46% of enrolled students per module. Throughout the entire course, only 5% of the class took advantage of online office hours (i.e., "chat rooms").

In the winter 2009 course offering, students posted 641 messages on the discussion boards (8.78 messages per student). Online office hours were not held during this session, due to their lack of use in the fall 2008 offering. Optional quizzes were completed by an average of 80% of enrolled students per module, and optional assignments were completed by an average of 46% of enrolled students per module.

In the fall 2009 course offering, students posted 345 messages on the discussion boards (5.75 messages per student). As with the winter 2009 offering, online office hours were not held during this session. Optional quizzes were completed by an average of 69% of enrolled students per module, and optional assignments were completed by an average of 35% of enrolled students per module.

In the fall 2008 and the winter 2009 offerings, there was a strong and significant correlation between final exam scores and the number of optional quizzes completed by a student (Pearson Correlation Coefficient = 0.78 and 0.75, respectively; $P < 0.0001$ for both). There was a weaker, but still significant correlation between final exam scores and the number of optional assignments completed by a student in the fall 2008 and winter 2009 course offerings (Pearson Correlation Coefficient=0.55 and 0.36, respectively; $P < 0.05$ for both). These analyses were not conducted for the fall 2009 offering of the online Master Gardener course.

The Facebook group drew a total of 20 students, across all sessions (11%). Interestingly, 114 additional Master Gardeners and members of the general public who were not involved with the online course independently found and joined the OSU Master Gardener Facebook group that was set up primarily for online students.

Conclusion

The first three offerings of this new online Master Gardener course have been successful at attracting and training students. As predicted by an earlier study (Dromgoole & Boleman, 2006) and as shown by earlier offerings of an online Master Gardener course (Jeanette & Meyer, 2002, VanderZanden et al., 2002), students readily adopted an online course that focused on home horticulture topics in the context of training new Master Gardener volunteers. The percentage of students who successfully completed the online Master Gardener course is comparable to the percentage of Master Gardener trainees who complete their coursework and volunteer practicum out of a county Extension office. Students who took full advantage of the course, by completing optional quizzes and assignments were more likely to successfully complete the course, relative to students who did not take advantage of optional course assessments.

One potential criticism of the online training of Master Gardeners is that Master Gardeners who take a course online may have schedules that prevent them from completing their volunteer practicum out of a county Extension office. Further study is needed on the long-term retention of online versus on-site trained Master Gardener volunteers within the program, before the validity of this criticism can be assessed. However, some populations, such as K-12 teachers, benefitted from the availability of an online version of the Master Gardener training course. Individuals within this group have flexible schedules during the summer, but are unable to take Master Gardener training in the winter (when coursework is normally offered out of county Extension offices).

A novel aspect of this online course is the Certificate of Home Horticulture option. This option accommodates individuals who are interested in learning the course material, but are not in a position to volunteer their time under the supervision of a participating OSU Extension office. Certificate students were able to fully participate in the online course, without the expectation of volunteer service hours. Although this option was originally envisioned as a means for green industry employees (i.e., those working in landscaping or nurseries) to participate in the course, the Certificate option ushered in a large group of national and international students. These students came from 11 states, one U.S. territory, and seven foreign countries and had unique perspectives and gardening challenges to share with their classmates. Such cosmopolitan discussions likely benefitted the class at large.

Because volunteer service is an integral component of the Extension Master Gardener Program, students pursuing the Certificate option did not receive a Master Gardener badge and are not considered Master Gardeners. Nonetheless, these individuals were introduced to the Extension Master Gardener Program and had access to a comprehensive course in home horticulture. In lieu of the expectation of volunteer service time, students paid a premium price to participate in the online course (i.e., \$100 more than the tuition charged for students who were pursuing a Master Gardener badge).

Online offerings, such as the OSU Extension online Master Gardener course, have the potential to broaden the reach of Extension and to introduce a new audience to Extension programs. Developing and delivering quality programs that are content rich and allow for students' interaction with each other and an instructor are critical to the adoption and success of such offerings. When thoughtfully constructed and administered, online courses can equal and even outperform their on-site counterparts (Jeanette & Meyer, 2002; Bernard et al.; 2004). In addition, as Extension continues to seek alternative sources of funding (Barth, Stryker, Arrington, & Syed, 1999), the revenue generated from online Extension programs may become increasingly important.

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